



**SEMICONDUCTOR**

# **PERFECT POWER SOLUTIONS**



**Version 5.0**



## » Company Profile

Perfect Intelligent Power Semiconductor Co.,Ltd (PIP SEMI) is a high-tech company located in Brighton, Colorado with focus on technology innovation and customer service. The company has built research and development centers and engineering labs in Los Angeles, Roseville and Dover.

PIP SEMI provides the most competitive products, complete solutions and best services for customers, by focusing on the design and development on advanced power semiconductor device and IC, wafer development and package test process technology. The company has multiple patents on process manufacturing and product design. Products developed and produced by PIP SEMI, such as VDMOS, SG MOS , Coolmos, IGBT, SBR, Gate Driver IC and MEMS are applied in different fields, including consumer electronics, smart home, intelligent lighting, industrial control equipment and electric vehicle.

Adhere to the customer demand, our eternal mission is to creat value for our customers. As your reliable partner, PIP SEMI looks forward to experience and share the success and future with you.

## » 公司简介

PIPSEMI成立于美国科罗拉多州Brighton，是一家以科技创新、服务客户为核心的高新技术企业，在美国洛杉矶、丹佛、罗丝维尔设有研发中心和工程实验室。

公司专注于先进半导体功率器件和集成电路的设计研发、芯片加工技术和封装测试技术，提供给客户最具竞争力的产品，完整的解决方案及最优质的服务。公司在工艺制造和产品设计方面已拥有多项专利，公司开发和生产VDMOS、SG MOS、Coolmos、IGBT、SBR、Gate Driver IC、MEMS等半导体产品，产品应用领域广泛，涵盖电子类多个领域，如消费电子、智能家居、智能照明、工控设备、电动汽车等。

公司一直以客户需求为核心，为客户创造价值是我们永远的宗旨。PIPSEMI永远是您可以信赖的朋友，并始终期待着与您一起分享成功和未来。

# Planar MOS



| SN | Part Number<br>"x" means package code | Configuration | Parameter               |                       |                    |     |     |  |       |  |      |                          | Typical Package            |        |         |        |        |        |       |        |
|----|---------------------------------------|---------------|-------------------------|-----------------------|--------------------|-----|-----|--|-------|--|------|--------------------------|----------------------------|--------|---------|--------|--------|--------|-------|--------|
|    |                                       |               | V <sub>DSS</sub><br>(V) | I <sub>D</sub><br>(A) | V <sub>th</sub> ,V |     |     | R <sub>DS(on)</sub> (m)<br>@V <sub>GS</sub> =10V |       | R <sub>DS(on)</sub> (mΩ)<br>@V <sub>GS</sub> =4.5V |      | Q <sub>g,nc</sub><br>Typ | C <sub>iss</sub> PF<br>Typ | TO-220 | TO-220F | TO-251 | TO-252 | TO-262 | TO-3P | TO-247 |
|    |                                       |               |                         |                       | Min                | Typ | Max | Max  | Typ   | MAX  | TYP  |                          |                            | P      | A       | U      | D      | L      | W     | F      |
| 1  | PTx04N04A                             | Single-N      | 40                      | 200                   | 2                  | --  | 4   | 4.5m   | --    | --   | --   | --                       | --                         | *      |         |        |        |        |       |        |
| 2  | PTx08N06A                             | Single-N      | 60                      | 100                   | 2                  | --  | 4   | 8m   | 7.4m  | --   | --   | 60                       | 4000                       | *      |         |        |        |        |       |        |
| 3  | PTP16N06A                             | Single-N      | 60                      | 55                    | 2                  | --  | 4   | 18m  | 15m   | --   | --   | 41                       | 1730                       | *      |         |        |        |        |       |        |
| 4  | PTP20N06A                             | Single-N      | 60                      | 50                    | 2                  | --  | 4   | 23m  | 19m   | --   | --   | --                       | --                         | *      |         |        |        |        |       |        |
| 5  | PTx11N08A                             | Single-N      | 80                      | 75                    | 2                  | --  | 4   | 11m  | 9.5m  | --   | --   | 69                       | 4541                       | *      |         |        |        |        |       |        |
| 6  | PTx23N10A                             | Single-N      | 100                     | 57                    | 2                  | --  | 4   | 23m  | --    | --   | --   | 114                      | 4563                       | *      |         |        |        |        |       |        |
| 7  | PTx540                                | Single-N      | 100                     | 33                    | 2                  | --  | 4   | 44m  | 30m   | --   | --   | 37                       | 2700                       | *      | *       | *      | *      |        |       |        |
| 8  | PTx09N20A                             | Single-N      | 200                     | 9                     | 2                  | --  | 4   | 0.300  | 0.250 | --   | --   | 16                       | 670                        | *      |         |        |        |        |       |        |
| 9  | PTx09N20C                             | Single-N      | 200                     | 9                     | 1                  | --  | 3   | 0.300  | 0.250 | 0.32   | 0.27 | 16                       | 420                        |        |         |        | *      |        |       |        |
| 10 | PTx11N20C                             | Single-N      | 200                     | 11                    | 1                  | --  | 3   | 0.300  | 0.250 | 0.32   | 0.27 | 16                       | 420                        |        |         |        | *      |        |       |        |
| 11 | PTx18N20A                             | Single-N      | 200                     | 18                    | 2                  | --  | 4   | 0.180  | 0.120 | --   | --   | 34                       | 1256                       | *      |         |        |        |        |       |        |
| 12 | PTx18N20B                             | Single-N      | 200                     | 18                    | 2                  | --  | 4   | 0.180  | 0.130 | --   | --   | 50                       | 940                        |        |         |        | *      |        |       |        |
| 13 | PTx40N20                              | Single-N      | 200                     | 40                    | 2                  | --  | 4   | 0.065  | 0.050 | --   | --   | 97                       | 2800                       | *      |         |        |        |        | *     |        |
| 14 | PTW50N20                              | Single-N      | 200                     | 50                    | 2                  | --  | 4   | 0.050  | 0.040 | --   | --   | 210                      | 3700                       |        |         |        |        |        | *     |        |
| 15 | PTW90N20                              | Single-N      | 200                     | 90                    | 2                  | --  | 4   | 0.023  | 0.018 | --   | --   | 270                      | 6280                       |        |         |        |        |        | *     |        |
| 16 | PTA50N25                              | Single-N      | 250                     | 50                    | 2                  | --  | 4   | 0.060  | 0.045 | --   | --   | 210                      | 4000                       |        | *       |        |        |        |       |        |
| 17 | PTW69N30                              | Single-N      | 300                     | 69                    | 2                  | --  | 4   | 0.049  | 0.034 | --   | --   | 150                      | 7200                       |        |         |        |        |        | *     |        |
| 18 | PSx06N40                              | Single-N      | 400                     | 6                     | 2                  | --  | 4   | 1.000  | 0.780 | --   | --   | 14.5                     | 500                        |        | *       |        |        |        |       |        |
| 19 | PSx10N40                              | Single-N      | 400                     | 10                    | 2                  | --  | 4   | 0.500  | 0.400 | --   | --   | 28                       | 1254                       | *      | *       |        |        |        |       |        |
| 20 | PTx11N40                              | Single-N      | 400                     | 11                    | 2                  | --  | 4   | 0.500  | 0.350 | --   | --   | 28                       | 1254                       | *      | *       |        |        |        |       |        |
| 21 | PTx20N40                              | Single-N      | 400                     | 20                    | 2                  | --  | 4   | 0.220  | 0.170 | --   | --   | 65                       | 2650                       | *      | *       |        |        |        |       |        |
| 22 | PTx20N40B                             | Single-N      | 400                     | 20                    | 2                  | --  | 4   | 0.300  | 0.240 | --   | --   | 35                       | 2550                       | *      | *       |        |        |        |       |        |
| 23 | PTx50N40                              | Single-N      | 400                     | 50                    | 2                  | --  | 4   | 0.100  | 0.085 | --   | --   | 65                       | 2650                       |        | *       |        |        |        | *     |        |
| 24 | PTW60N40                              | Single-N      | 400                     | 60                    | 2                  | --  | 4   | 0.080  | 0.060 | --   | --   | 150                      | 7200                       |        |         |        |        |        | *     |        |
| 25 | PTA11N45                              | Single-N      | 450                     | 11                    | 2                  | --  | 4   | 0.500  | 0.390 | --   | --   | 28                       | 1250                       | *      | *       | *      | *      |        |       |        |
| 26 | PSx05N50                              | Single-N      | 500                     | 5                     | 2                  | --  | 4   | 1.500  | 1.300 | --   | --   | 14                       | 525                        | *      | *       | *      | *      |        |       |        |
| 27 | PTx07N50                              | Single-N      | 500                     | 7                     | 2                  | --  | 4   | 1.200  | 1.000 | --   | --   | 14                       | 800                        |        | *       | *      | *      |        |       |        |
| 28 | PSx5090                               | Single-N      | 500                     | 9                     | 2                  | --  | 4   | 0.900  | 0.700 | --   | --   | 24                       | 960                        |        | *       | *      | *      |        |       |        |
| 29 | PTx09N50                              | Single-N      | 500                     | 9                     | 2                  | --  | 4   | 0.750  | 0.550 | --   | --   | 28                       | 1253                       | *      | *       |        |        |        |       |        |
| 30 | PTx12N50B                             | Single-N      | 500                     | 12                    | 2                  | --  | 4   | 0.520  | 0.440 | --   | --   | 30                       | 1600                       | *      | *       |        |        |        |       |        |
| 31 | PTx13N50B                             | Single-N      | 500                     | 12                    | 2                  | --  | 4   | 0.500  | 0.400 | --   | --   | 32                       | 1180                       | *      | *       |        |        |        |       |        |
| 32 | PSx13N50                              | Single-N      | 500                     | 13                    | 2                  | --  | 4   | 0.480  | 0.400 | --   | --   | 45                       | 2150                       | *      | *       |        |        |        |       |        |
| 33 | PTx15N50                              | Single-N      | 500                     | 15                    | 2                  | --  | 4   | 0.450  | 0.330 | --   | --   | 45                       | 2150                       | *      | *       |        |        |        |       |        |

# Planar MOS



| SN | Part Number<br>"x" means package code | Configuration | Parameter               |                       |                    |     |     |  |       |  |     |                          | Typical Package |        |         |        |        |        |       |        |   |
|----|---------------------------------------|---------------|-------------------------|-----------------------|--------------------|-----|-----|--|-------|--|-----|--------------------------|-----------------|--------|---------|--------|--------|--------|-------|--------|---|
|    |                                       |               | V <sub>DSS</sub><br>(V) | I <sub>D</sub><br>(A) | V <sub>th</sub> ,V |     |     | R <sub>DS(on)</sub> (Ω)<br>@V <sub>GS</sub> =10V |       | R <sub>DS(on)</sub> (mΩ)<br>@V <sub>GS</sub> =4.5V |     | Q <sub>g,nc</sub><br>Typ | Ciss PF<br>Typ  | TO-220 | TO-220F | TO-251 | TO-252 | TO-262 | TO-3P | TO-247 |   |
|    |                                       |               |                         |                       | Min                | Typ | Max | Max  | Typ   | MAX  | TYP |                          |                 | P      | A       | U      | D      | L      | W     | F      |   |
| 34 | PTx15N50B                             | Single-N      | 500                     | 15                    | 2                  | --  | 4   | 0.470  | 0.380 | --   | --  | 35                       | 2200            | *      | *       |        |        |        |       |        |   |
| 35 | PTx17N50                              | Single-N      | 500                     | 17                    | 2                  | --  | 4   | 0.380  | 0.280 | --   | --  | 45                       | 2500            | *      | *       |        |        |        |       |        |   |
| 36 | PTx18N50                              | Single-N      | 500                     | 17                    | 2                  | --  | 4   | 0.350  | 0.270 | --   | --  | 65                       | 2670            | *      | *       |        |        |        |       |        |   |
| 37 | PTx20N50A                             | Single-N      | 500                     | 20                    | 2                  | --  | 4   | 0.300  | 0.240 | --   | --  | 65                       | 2670            |        | *       |        |        |        |       |        |   |
| 38 | PTx28N50                              | Single-N      | 500                     | 28                    | 2                  | --  | 4   | 0.210  | 0.170 | --   | --  | 78                       | 4280            |        | *       |        |        |        |       | *      |   |
| 39 | PTx30N50EL                            | Single-N      | 500                     | 30                    | 2.5                | --  | 4.5 | 0.200  | 0.150 | --   | --  | 108                      | 4150            |        |         |        |        |        |       | *      | * |
| 40 | PTW40N50                              | Single-N      | 500                     | 46                    | 2                  | --  | 4   | 0.100  | 0.085 | --   | --  | 150                      | 6888            |        |         |        |        |        |       | *      |   |
| 41 | PTx02N60                              | Single-N      | 600                     | 2                     | 2                  | --  | 4   | 4.500  | 3.200 | --   | --  | 9                        | 281             |        |         | *      | *      |        |       |        |   |
| 42 | PSx04N60                              | Single-N      | 600                     | 4                     | 2                  | --  | 4   | 2.300  | 1.800 | --   | --  | 15                       | 550             |        | *       | *      | *      |        |       |        |   |
| 43 | PSx04N60B                             | Single-N      | 600                     | 4                     | 2                  | --  | 4   | 2.300  | 2.000 | --   | --  | 8.5                      | 450             |        | *       | *      | *      |        |       |        |   |
| 44 | PSx05N60                              | Single-N      | 600                     | 4                     | 2                  | --  | 4   | 2.200  | 1.750 | --   | --  | 12                       | 667             |        | *       | *      | *      |        |       |        |   |
| 45 | PTx06N60C                             | Single-N      | 600                     | 6                     | 2                  | --  | 4   | 1.700  | 1.400 | --   | --  | 19                       | 700             |        | *       | *      | *      |        |       |        |   |
| 46 | PSx07N60                              | Single-N      | 600                     | 7                     | 2                  | --  | 4   | 1.250  | 1.000 | --   | --  | 25                       | 1050            |        | *       | *      | *      |        |       |        |   |
| 47 | PTx07N60B                             | Single-N      | 600                     | 7                     | 2                  | --  | 4   | 1.250  | 1.000 | --   | --  | 20                       | 1120            |        | *       | *      | *      |        |       |        |   |
| 48 | PTx08N60                              | Single-N      | 600                     | 8                     | 2                  | --  | 4   | 1.100  | 0.800 | --   | --  | 29                       | 1253            |        | *       | *      | *      |        |       |        |   |
| 49 | PTx10N60B                             | Single-N      | 600                     | 10                    | 2                  | --  | 4   | 0.750  | 0.650 | --   | --  | 32                       | 1660            |        | *       |        |        |        |       |        |   |
| 50 | PSx10N60                              | Single-N      | 600                     | 10                    | 2                  | --  | 4   | 0.750  | 0.600 | --   | --  | 40                       | 1560            |        | *       |        |        |        |       |        |   |
| 51 | PSx10N60C                             | Single-N      | 600                     | 10                    | 2                  | --  | 4   | 0.750  | 0.650 | --   | --  | 31                       | 1264            |        | *       |        |        |        |       |        |   |
| 52 | PTx12N60                              | Single-N      | 600                     | 12                    | 2                  | --  | 4   | 0.700  | 0.550 | --   | --  | 44                       | 1540            |        | *       |        |        |        |       |        |   |
| 53 | PTx13N60                              | Single-N      | 600                     | 13                    | 2                  | --  | 4   | 0.600  | 0.450 | --   | --  | 46                       | 2120            |        | *       |        |        |        |       |        |   |
| 54 | PTx16N60                              | Single-N      | 600                     | 16                    | 2                  | --  | 4   | 0.500  | 0.400 | --   | --  | 40                       | 2400            |        | *       |        |        |        |       |        |   |
| 55 | PTx20N60A                             | Single-N      | 600                     | 20                    | 2                  | --  | 4   | 0.450  | 0.320 | --   | --  | 65                       | 2600            |        | *       |        |        |        |       |        |   |
| 56 | PTA26N60                              | Single-N      | 600                     | 26                    | 2                  | --  | 4   | 0.350  | 0.250 | --   | --  | 78                       | 4280            |        | *       |        |        |        |       |        |   |
| 57 | PTW36N60                              | Single-N      | 600                     | 36                    | 2                  | --  | 4   | 0.180  | 0.120 | --   | --  | 150                      | 7400            |        |         |        |        |        |       | *      |   |
| 58 | PTx02N65                              | Single-N      | 650                     | 2                     | 2                  | --  | 4   | 5.000  | 4.000 | --   | --  | 9                        | 290             |        |         | *      | *      |        |       |        |   |
| 59 | PSx04N65                              | Single-N      | 650                     | 4                     | 2                  | --  | 4   | 2.500  | 1.900 | --   | --  | 15                       | 544             |        | *       | *      | *      |        |       |        |   |
| 60 | PSx04N65C                             | Single-N      | 650                     | 4                     | 2                  | --  | 4   | 2.500  | 2.000 | --   | --  | 17.5                     | 650             |        | *       | *      | *      |        |       |        |   |
| 61 | PSx04N65B                             | Single-N      | 650                     | 4                     | 2                  | --  | 4   | 2.500  | 2.100 | --   | --  | 8.5                      | 450             |        | *       | *      | *      |        |       |        |   |
| 62 | PTx05N65                              | Single-N      | 650                     | 5                     | 2                  | --  | 4   | 2.500  | 2.000 | --   | --  | 17                       | 650             |        | *       | *      | *      |        |       |        |   |
| 63 | PTx06N65C                             | Single-N      | 650                     | 6                     | 2                  | --  | 4   | 1.850  | 1.550 | --   | --  | 16                       | 660             |        | *       | *      | *      |        |       |        |   |
| 64 | PSx07N65                              | Single-N      | 650                     | 7                     | 2                  | --  | 4   | 1.400  | 1.100 | --   | --  | 25                       | 1050            |        | *       | *      | *      |        |       |        |   |
| 65 | PTx07N65B                             | Single-N      | 650                     | 7                     | 2                  | --  | 4   | 1.400  | 1.200 | --   | --  | 20                       | 1120            |        | *       | *      | *      |        |       |        |   |
| 66 | PTx08N65                              | Single-N      | 650                     | 8                     | 2                  | --  | 4   | 1.300  | 0.950 | --   | --  | 28                       | 1240            |        | *       | *      | *      |        |       |        |   |
| 67 | PTx10N65B                             | Single-N      | 650                     | 10                    | 2                  | --  | 4   | 0.900  | 0.750 | --   | --  | 32                       | 1660            |        | *       |        |        |        |       |        |   |

# Planar MOS



| SN  | Part Number<br>"x" means package code | Configuration | Parameter               |                       |                     |     |     |  |       |  |     |                          | Typical Package            |        |         |        |        |        |       |        |   |
|-----|---------------------------------------|---------------|-------------------------|-----------------------|---------------------|-----|-----|--|-------|--|-----|--------------------------|----------------------------|--------|---------|--------|--------|--------|-------|--------|---|
|     |                                       |               | V <sub>DSS</sub><br>(V) | I <sub>D</sub><br>(A) | V <sub>th</sub> , V |     |     | R <sub>DS(on)</sub> (Ω)<br>@V <sub>GS</sub> =10V |       | R <sub>DS(on)</sub> (mΩ)<br>@V <sub>GS</sub> =4.5V |     | Q <sub>g,nc</sub><br>Typ | C <sub>iss</sub> PF<br>Typ | TO-220 | TO-220F | TO-251 | TO-252 | TO-262 | TO-3P | TO-247 |   |
|     |                                       |               |                         |                       | Min                 | Typ | Max | Max  | Typ   | MAX  | TYP |                          |                            | P      | A       | U      | D      | L      | W     | F      |   |
| 68  | PSx10N65C                             | Single-N      | 650                     | 10                    | 2                   | --  | 4   | 0.850  | 0.700 | --   | --  | 43                       | 1340                       |        | *       |        |        |        |       |        |   |
| 69  | PTx12N65                              | Single-N      | 650                     | 12                    | 2                   | --  | 4   | 0.750  | 0.600 | --   | --  | 52                       | 1900                       |        | *       |        |        |        |       |        |   |
| 70  | PTx13N65                              | Single-N      | 650                     | 13                    | 2                   | --  | 4   | 0.650  | 0.550 | --   | --  | 46                       | 2130                       |        | *       |        |        |        |       |        |   |
| 71  | PTx16N65                              | Single-N      | 650                     | 16                    | 2                   | --  | 4   | 0.550  | 0.450 | --   | --  | 54                       | 2442                       |        | *       |        |        |        |       |        |   |
| 72  | PTx20N65A                             | Single-N      | 650                     | 20                    | 2                   | --  | 4   | 0.500  | 0.330 | --   | --  | 65                       | 2600                       |        | *       |        |        |        |       |        |   |
| 73  | PTx26N65                              | Single-N      | 650                     | 26                    | 2                   | --  | 4   | 0.380  | 0.280 | --   | --  | 78                       | 4200                       |        | *       |        |        |        |       |        |   |
| 74  | PTW34N65                              | Single-N      | 650                     | 34                    | 2                   | --  | 4   | 0.190  | 0.130 | --   | --  | 150                      | 7400                       |        |         |        |        |        |       | *      |   |
| 75  | PSx04N70                              | Single-N      | 700                     | 4                     | 2                   | --  | 4   | 2.800  | 2.500 | --   | --  | 15                       | 500                        |        | *       | *      | *      |        |       |        |   |
| 76  | PSx06N70                              | Single-N      | 700                     | 6                     | 2                   | --  | 4   | 1.600  | 1.350 | --   | --  | 23.5                     | 938                        |        | *       | *      | *      |        |       |        |   |
| 77  | PTx06N70B                             | Single-N      | 700                     | 6                     | 2                   | --  | 4   | 1.800  | 1.450 | --   | --  | 20                       | 1100                       |        | *       | *      | *      |        |       |        |   |
| 78  | PTx10N70B                             | Single-N      | 700                     | 10                    | 2                   | --  | 4   | 1.000  | 0.876 | --   | --  | 32                       | 1650                       |        | *       |        |        |        |       |        |   |
| 79  | PSx10N70                              | Single-N      | 700                     | 10                    | 2                   | --  | 4   | 0.900  | 0.800 | --   | --  | 40                       | 1540                       |        | *       |        |        |        |       |        |   |
| 80  | PTx12N70                              | Single-N      | 700                     | 12                    | 2                   | --  | 4   | 0.850  | 0.720 | --   | --  | 30                       | 1950                       |        | *       |        |        |        |       |        |   |
| 81  | PTx16N70                              | Single-N      | 700                     | 16                    | 2                   | --  | 4   | 0.750  | 0.600 | --   | --  | 40                       | 2400                       |        | *       |        |        |        |       |        |   |
| 82  | PTx20N70A                             | Single-N      | 700                     | 20                    | 2                   | --  | 4   | 0.700  | 0.500 | --   | --  | 61                       | 3590                       |        | *       |        |        |        |       |        |   |
| 83  | PTx26N70                              | Single-N      | 700                     | 26                    | 2                   | --  | 4   | 0.450  | 0.350 | --   | --  | 78                       | 4200                       |        | *       |        |        |        |       | *      |   |
| 84  | PTW32N70                              | Single-N      | 700                     | 32                    | 2                   | --  | 4   | 0.210  | 0.160 | --   | --  | 145                      | 7400                       |        |         |        |        |        |       | *      |   |
| 85  | PTx04N80                              | Single-N      | 800                     | 4                     | 2                   | --  | 4   | 4.800  | 3.700 | --   | --  | 16                       | 490                        |        | *       | *      | *      |        |       |        |   |
| 86  | PTx07N80                              | Single-N      | 800                     | 7                     | 3                   | --  | 5   | 1.800  | 1.500 | --   | --  | 34                       | 1350                       |        | *       |        |        |        |       |        |   |
| 87  | PTx10N80                              | Single-N      | 800                     | 10                    | 2                   | --  | 4   | 1.150  | 1.000 | --   | --  | 60                       | 2900                       |        | *       |        |        |        |       |        |   |
| 88  | PTx14N80                              | Single-N      | 800                     | 14                    | 2                   | --  | 4   | 0.720  | 0.630 | --   | --  | --                       | --                         |        | *       |        |        |        |       |        | * |
| 89  | PTF27N80                              | Single-N      | 800                     | 27                    | 2.5                 | --  | 4.5 | 0.350  | 0.280 | --   | --  | 180                      | 7300                       |        |         |        |        |        |       |        | * |
| 90  | PTx04N90                              | Single-N      | 900                     | 4                     | 2                   | --  | 4   | 4.800  | 3.600 | --   | --  | 16                       | 490                        |        | *       |        |        |        |       |        |   |
| 91  | PTx06N90                              | Single-N      | 900                     | 6                     | 3                   | --  | 5   | 1.900  | 1.400 | --   | --  | 37                       | 1460                       |        | *       |        |        |        |       |        |   |
| 92  | PTx09N90                              | Single-N      | 900                     | 9                     | 2                   | --  | 4   | 1.400  | 1.200 | --   | --  | 48                       | 2500                       | *      | *       |        |        |        |       |        | * |
| 93  | PTx12N90                              | Single-N      | 900                     | 12                    | 2                   | --  | 4   | 1.000  | 0.850 | --   | --  | --                       | --                         |        | *       |        |        |        |       |        | * |
| 94  | PTF24N90                              | Single-N      | 900                     | 24                    | 3                   | --  | 5   | 0.420  | 0.320 | --   | --  | 183                      | 7500                       |        |         |        |        |        |       |        | * |
| 95  | PTx02N100                             | Single-N      | 1000                    | 2                     | 2                   | --  | 4   | 8.800  | 7.800 | --   | --  | 15                       | 380                        |        | *       |        |        |        |       |        |   |
| 96  | PTx04N100                             | Single-N      | 1000                    | 4                     | 3                   | --  | 5   | 2.500  | 2.200 | --   | --  | 36                       | 1470                       |        | *       |        |        |        |       |        |   |
| 97  | PTx06N100                             | Single-N      | 1000                    | 6                     | 2.5                 | --  | 4.5 | 2.300  | 2.000 |  |     |                          |                            |        | *       |        |        |        |       |        |   |
| 98  | PTx10N100                             | Single-N      | 1000                    | 10                    | 3                   | --  | 5   | 1.4  | 1     | --   | --  | --                       | --                         |        | *       |        |        |        |       |        | * |
| 99  | PTF24N100                             | Single-N      | 1000                    | 24                    | 2.5                 | --  | 4.5 | 0.45   | 0.38  | --   | --  | 183                      | 7400                       |        |         |        |        |        |       |        | * |
| 100 | PTFN38N100                            | Single-N      | 1000                    | 38                    | 2                   | --  | 4   | 0.28   | 0.24  | --   | --  | 240                      | 2125                       |        |         |        |        |        |       |        |   |
| 101 | PTx03N150                             | Single-N      | 1500                    | 3                     | 2.5                 | --  | 4.5 | 8.2  | 5.4   | --   | --  | 36                       | 1600                       |        | *       |        |        |        |       |        |   |

# Trench MOS



| SN | Part Number<br>"x" means package code | Configuration | Parameter               |                       |                     |     |     |   |       |  |     |                     |                     | Typical Package |              |             |             |             |                                   |                     |           |
|----|---------------------------------------|---------------|-------------------------|-----------------------|---------------------|-----|-----|---|-------|--|-----|---------------------|---------------------|-----------------|--------------|-------------|-------------|-------------|-----------------------------------|---------------------|-----------|
|    |                                       |               | V <sub>DSS</sub><br>(V) | I <sub>b</sub><br>(A) | V <sub>th</sub> (V) |     |     | R <sub>DS(on)</sub> (mΩ)<br>@V <sub>GS</sub> =10V |       | R <sub>DS(on)</sub> (mΩ)<br>@V <sub>GS</sub> =4.5V |     | Q <sub>g</sub> (nC) | C <sub>iss</sub> PF | TO-220<br>P     | TO-220F<br>A | TO-263<br>B | TO-251<br>U | TO-252<br>D | Power<br>PAKS <sup>®</sup> 6<br>J | SOT-<br>23-6L<br>Z6 | SOP8<br>S |
|    |                                       |               |                         |                       | MIN                 | TYP | MAX | Max   | Typ   | MAX  | TYP |                     |                     |                 |              |             |             |             |                                   |                     |           |
| 1  | P4407                                 | Single-N      | -30                     | -12                   | -1                  |     | -3  | 14.00   | 10.00 | 20   | 13  | 25                  | 1800                |                 |              |             |             |             |                                   |                     | *         |
| 2  | PIP8205-Z6                            | Dual-N        | 20                      | 7                     | 1                   | --  | 3   | 2000  | 16.00 | 22   | 18  | 12                  | 900                 |                 |              |             |             |             |                                   | *                   |           |
| 3  | N4406                                 | Single-N      | 30                      | 10                    | 1                   | --  | 3   | 10.00   | 7.80  | 15   | 8   | 10                  | 1600                |                 |              |             |             |             |                                   |                     | *         |
| 4  | PTP02N03N                             | Single-N      | 30                      | 120                   | 1                   | --  | 3   | 3.40  | 2.60  | 4.7  | 3.6 | 88                  | 5700                | *               |              |             |             |             |                                   |                     |           |
| 5  | PTx04N03NL                            | Single-N      | 30                      | 115                   | 1                   | --  | 3   | 5.40  | 4.50  | 9  | 7.5 | 23                  | 1200                | *               |              |             |             |             |                                   |                     |           |
| 6  | PTP01N04N                             | Single-N      | 40                      | 320                   | 2                   | --  | 4   | 1.50  | 1.30  | --   | --  | 148                 | 10800               | *               |              |             |             |             |                                   |                     |           |
| 7  | PTP02N04N                             | Single-N      | 40                      | 280                   | 2                   | --  | 4   | 2.00  | 1.60  | --   | --  | 129                 | 12800               | *               |              |             |             |             |                                   |                     |           |
| 8  | PTP02N04NB                            | Single-N      | 40                      | 245                   | 2                   | --  | 4   | 2.10  | 1.65  | --   | --  | 125                 | 5100                | *               |              |             |             |             |                                   |                     |           |
| 9  | PTP03N04N                             | Single-N      | 40                      | 240                   | 2                   | --  | 4   | 3.00  | 2.10  | --   | --  | 74                  | 5020                | *               |              |             |             |             |                                   |                     |           |
| 10 | PTP04N04N                             | Single-N      | 40                      | 206                   | 2                   | --  | 4   | 4.00  | 3.00  | --   | --  | 50.8                | 2980                | *               |              |             |             |             |                                   |                     |           |
| 11 | PTJ04N04NL                            | Single-N      | 40                      | 80                    | 1                   | --  | 3   | 4.00  | 3.00  | 4.5  | 4.2 | 50.8                | 2980                |                 |              |             |             |             | *                                 |                     |           |
| 12 | PTP02N06NB                            | Single-N      | 60                      | 177                   | 2                   | --  | 4   | 3.20  | 2.50  | --   | --  | 109                 | 6200                | *               |              |             |             |             |                                   |                     |           |
| 13 | PTP02N06NBL                           | Single-N      | 60                      | 177                   | 1                   | --  | 3   | 3.20  | 2.50  | 5.1  | 3.8 | 109                 | 6200                | *               |              |             |             |             |                                   |                     |           |
| 14 | PTP03N06N                             | Single-N      | 60                      | 246                   | 2                   | --  | 4   | 2.80  | 2.10  | --   | --  | 147                 | 1300                | *               |              |             |             |             |                                   |                     |           |
| 15 | PTP03N06NB                            | Single-N      | 60                      | 150                   | 2                   | --  | 4   | 4.50  | 3.40  | --   | --  | 162                 | 6500                | *               |              |             |             |             |                                   |                     |           |
| 16 | PTP04N06N                             | Single-N      | 60                      | 208                   | 2                   | --  | 4   | 3.80  | 2.70  | --   | --  | 113                 | 9110                | *               |              |             |             |             |                                   |                     |           |
| 17 | PTP06N06N                             | Single-N      | 60                      | 140                   | 2                   | --  | 4   | 7.00  | 5.70  | --   | --  | 62                  | 3396                | *               |              |             |             |             |                                   |                     |           |
| 18 | PTP08N06N                             | Single-N      | 60                      | 110                   | 2                   | --  | 4   | 8.00  | 6.50  | --   | --  | 51                  | 3396                | *               |              |             |             |             |                                   |                     |           |
| 19 | PTx9506E                              | Single-N      | 68                      | 95                    | 2                   | --  | 4   | 7.50  | 6.50  | --   | --  | 70                  | 4200                | *               |              |             | *           |             |                                   |                     |           |
| 20 | PTS12N06N                             | Single-N      | 60                      | 12                    | 1                   | --  | 3   | 16.00   | 13.00 | 16   | 20  | 21                  | 1100                |                 |              |             |             |             |                                   |                     | *         |
| 21 | PTP16N06N                             | Single-N      | 60                      | 55                    | 1                   | --  | 3   | 17.00   | 13.50 | --   | --  | 50                  | 2050                | *               |              |             |             |             |                                   |                     |           |
| 22 | PTx02N08N                             | Single-N      | 80                      | 209                   | 2                   | --  | 4   | 3.50  | 2.70  | --   | --  | 149                 | 14300               | *               |              |             |             |             |                                   |                     |           |
| 23 | PTP03N08N                             | Single-N      | 80                      | 179                   | 2                   | --  | 4   | 4.70  | 4.00  | --   | --  | 117                 | 9320                | *               |              |             |             |             |                                   |                     |           |
| 24 | PTP03N08NB                            | Single-N      | 80                      | 179                   | 2                   | --  | 4   | 4.70  | 4.00  | --   | --  | 100                 | 5800                | *               |              |             |             |             |                                   |                     |           |
| 25 | PTP35N08N                             | Single-N      | 80                      | 150                   | 2                   | --  | 4   | 5.00  | 3.80  | --   | --  | 140                 | 6300                | *               |              |             |             |             |                                   |                     |           |
| 26 | PTx14508E                             | Single-N      | 80                      | 145                   | 2                   | --  | 4   | 5.90  | 4.80  | --   | --  | 160                 | 8200                | *               |              |             | *           |             |                                   |                     |           |
| 27 | PTP06N08N                             | Single-N      | 80                      | 110                   | 2                   | --  | 4   | 6.50  | 5.20  | --   | --  | 59.6                | 4400                | *               |              |             |             |             |                                   |                     |           |
| 28 | PTP08N08N                             | Single-N      | 80                      | 80                    | 2                   | --  | 4   | 8.00  | 6.30  | --   | --  | 72                  | 3700                | *               |              |             |             |             |                                   |                     |           |
| 29 | PTP10N08N                             | Single-N      | 80                      | 77                    | 2                   | --  | 4   | 10.00   | 7.90  | --   | --  | 43                  | 2465                | *               |              |             |             |             |                                   |                     |           |
| 30 | PTP05N08NA                            | Single-N      | 85                      | 120                   | 2                   | --  | 4   | 5.80  | 4.60  | --   | --  | 100                 | 5000                | *               |              |             |             |             |                                   |                     |           |
| 31 | PTP08N08NA                            | Single-N      | 85                      | 109                   | 2                   | --  | 4   | 7.00  | 5.70  | --   | --  | 62                  | 3400                | *               |              |             |             |             |                                   |                     |           |
| 32 | PTx8508E                              | Single-N      | 82                      | 85                    | 2                   | --  | 4   | 9.40  | 7.80  | --   | --  | 92                  | 5400                | *               |              |             | *           |             |                                   |                     |           |
| 33 | PTx11508E                             | Single-N      | 82                      | 115                   | 2                   | --  | 4   | 7.50  | 6.40  | --   | --  | 112                 | 6650                | *               |              |             | *           |             |                                   |                     |           |
| 34 | SPTS8R22D                             | Dual-N        | 75                      | 8                     | 1                   | --  | 3   | 22.00   | 17.00 | 25   | 19  | 25                  | 1150                |                 |              |             |             |             |                                   |                     | *         |
| 35 | SPTS8R22                              | Single-N      | 75                      | 8                     | 1                   | --  | 3   | 22.00   | 17.00 | 25   | 19  | 25                  | 1150                |                 |              |             |             |             |                                   |                     | *         |
| 36 | PTP04N10N                             | Single-N      | 100                     | 167                   | 2                   | --  | 4   | 5.00  | 4.50  | --   | --  | 124                 | 14000               | *               |              |             |             |             |                                   |                     |           |
| 37 | PTP06N10N                             | Single-N      | 100                     | 160                   | 2                   | --  | 4   | 6.00  | 4.80  | --   | --  | 115                 | 9200                | *               |              |             |             |             |                                   |                     |           |
| 38 | PTP10N10N                             | Single-N      | 100                     | 77                    | 2                   | --  | 4   | 10.00   | 8.20  | --   | --  | 73                  | 5300                | *               |              |             |             |             |                                   |                     |           |
| 39 | PTP18N10N                             | Single-N      | 100                     | 59                    | 2                   | --  | 4   | 18.00   | 14.00 | --   | --  | 45                  | 2500                | *               |              |             |             |             |                                   |                     |           |
| 40 | PTP12N15N                             | Single-N      | 150                     | 112                   | 3                   | --  | 5   | 12.00   | 10    | --   | --  | 117                 | 6180                | *               |              |             |             |             |                                   |                     |           |

# SGT MOS



| SN | Part Number<br>"x" means package code | Configuration | Parameter        |                |                     |     |     |   |     |  |     |                   | Typical Package |        |         |        |        |      |        |
|----|---------------------------------------|---------------|------------------|----------------|---------------------|-----|-----|---|-----|--|-----|-------------------|-----------------|--------|---------|--------|--------|------|--------|
|    |                                       |               | V <sub>DSS</sub> | I <sub>D</sub> | V <sub>th</sub> , V |     |     | R <sub>DS(on)</sub> (mΩ) V <sub>GS</sub> =10V |     | R <sub>DS(on)</sub> (mΩ) V <sub>GS</sub> =4.5V |     | Q <sub>g,nc</sub> | Ciss PF         | TO-220 | TO-220F | TO-251 | TO-252 | SOP8 | TO-263 |
|    |                                       |               | (V)              | (A)            | Min                 | Typ | Max | Max   | Typ | Max  | Typ | Typ               | Typ             | P      | A       | U      | D      | S    | B      |
| 1  | PTx1210S                              | Single-N      | 100              |                | 2                   | --  | 4   |   |     | --   | --  |                   |                 | *      |         |        |        |      |        |
| 2  | SPTx10R09                             | Single-N      | 100              | 12             | 2                   | --  | 4   | 12  | 9   | --   | --  | 45                | 2400            |        |         |        |        | *    |        |
| 3  | SPTx10R22                             | Single-N      | 100              | 54             | 1                   | --  | 3   | 22  | 19  | 33   | 23  | 20                | 1100            |        |         |        | *      | *    |        |

\* 产品持续开发中

\* SGT MOSFET=Super Gate Trench MOSFET 超结栅沟槽场效应管通过采用最先进的超结构栅结构设计和完美的工艺技术,导通电阻与栅电荷显著下降,在应用中可减小系统功率损耗并提高其转换效率。

低传导损耗 (低 R<sub>ds(on)</sub>)

低切换损耗 (低 Q<sub>gd</sub>)

低驱动器损耗 (低 C<sub>iss</sub>)

# Depletion MOS

| SN | Part Number<br>"x" means package code | Configuration           | Status<br>M=Mass Product | Parameter        |                |                          |      |      |                         |     |                   |         |        | Typical Package |  |
|----|---------------------------------------|-------------------------|--------------------------|------------------|----------------|--------------------------|------|------|-------------------------|-----|-------------------|---------|--------|-----------------|--|
|    |                                       |                         |                          | V <sub>DSX</sub> | I <sub>D</sub> | V <sub>GS(Off)</sub> , V |      |      | R <sub>DS(on)</sub> (m) |     | Q <sub>g,nc</sub> | Ciss PF | SOT-23 |                 |  |
|    |                                       |                         |                          | (V)              | (A)            | Min                      | Typ  | Max  | Max                     | Typ | Typ               | Typ     | Z      | Z               |  |
| 1  | PDZ15R15K                             | Single-N Depletion-Mode | M                        | 150              | 0.2            | -8.0                     | --   | -6.0 | 15                      | 10  | 1                 | 12      | *      |                 |  |
| 2  | F501D                                 | Single-N Depletion-Mode | M                        | 600              | 0.012          | -2.7                     | -1.8 | -1.0 | 700                     | 350 | 1.1               | 50      | *      |                 |  |

# Low V<sub>F</sub> Schottky Diode

| SN | Part Number | Configuration | Parameter |           |         |         | Typical Package |           |        |       | Die Size<br>mil |
|----|-------------|---------------|-----------|-----------|---------|---------|-----------------|-----------|--------|-------|-----------------|
|    |             |               | VRM       | IF        | VF      |         | TO-220F-3L      | TO-220-3L | TO-263 | TO-3P |                 |
|    |             |               | (V)       | (A)       | Typ.(V) | Max.(V) | 3pin            | 3pin      | 2pin   | 3pin  |                 |
| 1  | MS10100CTF  | Dual          | 100       | 15(total) | 0.64    | 0.75    | *               |           |        |       | 75              |
| 2  | MS20L100CTF | Dual          | 100       | 20(total) | 0.62    | 0.75    | *               |           |        |       | 82              |
| 3  | MS20L80CTF  | Dual          | 100       | 20(total) | 0.62    | 0.75    | *               |           |        |       | 82              |
| 4  | MS20U80CTF  | Dual          | 80        | 20(total) | 0.60    | 0.70    | *               |           |        |       | 94              |
| 5  | MS30U100CTF | Dual          | 100       | 30(total) | 0.55    | 0.65    | *               |           |        |       | 94              |

\* 产品持续开发中

# IGBT

| SN | Part Number<br>"x" means package code | Configuration           | Parameter        |                         |                         |     |     |                        |     |                   |          | Typical Package |        |
|----|---------------------------------------|-------------------------|------------------|-------------------------|-------------------------|-----|-----|------------------------|-----|-------------------|----------|-----------------|--------|
|    |                                       |                         | V <sub>ce0</sub> | I <sub>C TC=100°C</sub> | V <sub>ge(th)</sub> , V |     |     | V <sub>cesat</sub> (V) |     | Q <sub>g,nc</sub> | Ciss, pF | TO-3P           | TO-247 |
|    |                                       |                         | (V)              | (A)                     | Min                     | Typ | Max | Typ                    | Max | Typ               | Typ      | *               | *      |
| 1  | IGW40N60A                             | Single-N parallel diode | 600              | 40                      | 4                       | 5   | 6.5 | 2.00                   | 2.4 | 130               | 4400     | *               | *      |
| 2  | IGW40N120A                            | Single-N parallel diode | 1200             | 40                      | 4                       | 5.6 | 7   | 2.00                   | 2.4 | 222               | 9100     | *               | *      |

# SJ MOSFET-Deep Trench



| SN | Part Number<br>"x" means package code | Configuration | Parameter               |                       |                     |     |     |                         |       |                          |                            | Typical Package |         |        |        |        |        |       |        |
|----|---------------------------------------|---------------|-------------------------|-----------------------|---------------------|-----|-----|-------------------------|-------|--------------------------|----------------------------|-----------------|---------|--------|--------|--------|--------|-------|--------|
|    |                                       |               | V <sub>DSS</sub><br>(V) | I <sub>D</sub><br>(A) | V <sub>th</sub> , V |     |     | R <sub>DS(on)</sub> (Ω) |       | Q <sub>g,nc</sub><br>Typ | C <sub>iss</sub> PF<br>Typ | TO-220          | TO-220F | TO-251 | TO-252 | TO-262 | TO-263 | TO-3P | TO-247 |
|    |                                       |               |                         |                       | Min                 | Typ | Max | Max                     | Typ   |                          |                            | P               | A       | U      | D      | L      | B      | W     | F      |
| 1  | SPTx22N50A                            | Single-N      | 500                     | 22                    | 2                   | --  | 4   | 0.150                   | 0.130 | 54                       | 2140                       | *               | *       |        |        |        | *      | *     |        |
| 2  | SPTx50R120                            | Single-N      | 500                     | 22                    | 2                   | --  | 4   | 0.140                   | 0.125 | 40.5                     | 1600                       | *               | *       | *      | *      | *      | *      |       |        |
| 3  | SPTx50R250                            | Single-N      | 500                     | 15                    | 2                   | --  | 4   | 0.360                   | 0.320 | 17                       | 700                        | *               | *       | *      | *      | *      | *      |       |        |
| 4  | SPTx50R400                            | Single-N      | 500                     | 7                     | 2                   | --  | 4   | 0.540                   | 0.480 | 10                       | 450                        | *               | *       | *      | *      | *      | *      |       |        |
| 5  | SPTx50R500                            | Single-N      | 500                     | 6                     | 2                   | --  | 4   | 0.650                   | 0.580 | 8                        | 400                        | *               | *       | *      | *      | *      | *      |       |        |
| 6  | SPTx50R690                            | Single-N      | 500                     | 4                     | 2                   | --  | 4   | 0.820                   | 0.730 | 7                        | 350                        | *               | *       | *      | *      | *      | *      |       |        |
| 7  | SPTx50R1K7                            | Single-N      | 500                     | 2                     | 2                   | --  | 4   | 1.700                   | 1.500 | 4                        | 200                        |                 |         | *      | *      |        |        |       |        |
| 8  | SPTx50R1K6                            | Single-N      | 500                     | 2                     | 2                   | --  | 4   | 1.800                   | 1.600 | 3.5                      | 170                        |                 |         | *      | *      |        |        |       |        |
| 9  | SPTF60R090MFD                         | Single-N      | 600                     | 47                    | 3                   | --  | 5   | 0.090                   | 0.077 | 75                       | 4500                       |                 |         |        |        |        |        | *     |        |
| 10 | SPTx60R150                            | Single-N      | 600                     | 20                    | 2                   | --  | 4   | 0.150                   | 0.130 | 41                       | 1605                       | *               | *       |        |        |        | *      | *     |        |
| 11 | SPTx60R260                            | Single-N      | 600                     | 15                    | 2                   | --  | 4   | 0.260                   | 0.230 | 28                       | 1300                       | *               | *       |        |        |        |        |       |        |
| 12 | SPTx60R350                            | Single-N      | 600                     | 12                    | 2                   | --  | 4   | 0.380                   | 0.340 | 17                       | 700                        | *               | *       | *      | *      | *      | *      |       |        |
| 13 | SPTx60R580                            | Single-N      | 600                     | 8                     | 2                   | --  | 4   | 0.580                   | 0.500 | 10                       | 450                        | *               | *       | *      | *      | *      | *      |       |        |
| 14 | SPTx60R700                            | Single-N      | 600                     | 6                     | 2                   | --  | 4   | 0.700                   | 0.630 | 8                        | 400                        | *               | *       | *      | *      | *      | *      |       |        |
| 15 | SPTx60R840                            | Single-N      | 600                     | 4                     | 2                   | --  | 4   | 0.900                   | 0.840 | 7                        | 350                        | *               | *       | *      | *      | *      | *      |       |        |
| 16 | SPTx60R1K7                            | Single-N      | 600                     | 2                     | 2                   | --  | 4   | 1.700                   | 1.540 | 4                        | 200                        |                 |         | *      | *      |        |        |       |        |
| 17 | SPTx60R1K8                            | Single-N      | 600                     | 2                     | 2                   | --  | 4   | 2.000                   | 1.800 | 3.5                      | 170                        |                 |         | *      | *      |        |        |       |        |
| 18 | SPTF65R041                            | Single-N      | 650                     | 78                    | 3.5                 | --  | 4.5 | 0.041                   | 0.038 | 120                      | 7090                       |                 |         |        |        |        |        | *     |        |
| 19 | SPTx65R080                            | Single-N      | 650                     | 47                    | 2.5                 | --  | 4.5 | 0.080                   | 0.065 | 90                       | 5000                       |                 |         |        |        |        |        | *     |        |
| 20 | SPTF65R100MFD                         | Single-N      | 650                     | 47                    | 3                   | --  | 5   | 0.100                   | 0.088 | 75                       | 3600                       |                 |         |        |        |        |        | *     |        |
| 21 | SPTx65R160                            | Single-N      | 650                     | 20                    | 2                   | --  | 4   | 0.180                   | 0.160 | 40                       | 1600                       | *               | *       |        |        |        | *      | *     |        |
| 22 | SPTx65R260                            | Single-N      | 650                     | 15                    | 2                   | --  | 4   | 0.260                   | 0.230 | 28                       | 1300                       | *               | *       |        |        |        |        |       |        |
| 23 | SPTx65R380                            | Single-N      | 650                     | 11                    | 2                   | --  | 4   | 0.420                   | 0.380 | 20                       | 700                        | *               | *       | *      | *      | *      | *      |       |        |
| 24 | SPTx65R600                            | Single-N      | 650                     | 7                     | 2                   | --  | 4   | 0.620                   | 0.560 | 10                       | 450                        | *               | *       | *      | *      | *      | *      |       |        |
| 25 | SPTx65R750                            | Single-N      | 650                     | 6                     | 2                   | --  | 4   | 0.750                   | 0.680 | 8                        | 400                        | *               | *       | *      | *      | *      | *      |       |        |
| 26 | SPTx65R950                            | Single-N      | 650                     | 4                     | 2                   | --  | 4   | 1.000                   | 0.880 | 7                        | 350                        | *               | *       | *      | *      | *      | *      |       |        |
| 27 | SPTx65R1K2                            | Single-N      | 650                     | 4                     | 2                   | --  | 4   | 1.200                   | 1.100 | 8.8                      | 200                        | *               | *       | *      | *      |        |        |       |        |
| 28 | SPTx65R2K3                            | Single-N      | 650                     | 2                     | 2                   | --  | 4   | 2.200                   | 2.000 | 3.5                      | 170                        |                 |         | *      | *      |        |        |       |        |
| 29 | SPTx70R190                            | Single-N      | 700                     | 20                    | 2                   | --  | 4   | 0.210                   | 0.190 | 41                       | 1605                       | *               | *       |        |        |        | *      | *     |        |
| 30 | SPTx70R390                            | Single-N      | 700                     | 15                    | 2                   | --  | 4   | 0.400                   | 0.380 | 22                       | 1000                       | *               | *       |        |        |        |        |       |        |
| 31 | SPTx70R450                            | Single-N      | 700                     | 11                    | 2                   | --  | 4   | 0.550                   | 0.490 | 17                       | 700                        | *               | *       | *      | *      | *      | *      |       |        |
| 32 | SPTx70R700                            | Single-N      | 700                     | 7                     | 2                   | --  | 4   | 0.850                   | 0.750 | 10                       | 450                        | *               | *       | *      | *      | *      | *      |       |        |
| 33 | SPTx70R950                            | Single-N      | 700                     | 6                     | 2                   | --  | 4   | 1.000                   | 0.860 | 8                        | 400                        | *               | *       | *      | *      | *      | *      |       |        |
| 34 | SPTx70R1K3                            | Single-N      | 700                     | 5                     | 2                   | --  | 4   | 1.400                   | 1.260 | 7                        | 350                        |                 |         | *      | *      |        |        |       |        |
| 35 | SPTx70R2K5                            | Single-N      | 700                     | 2                     | 2                   | --  | 4   | 2.500                   | 2.200 | 4                        | 200                        |                 |         | *      | *      |        |        |       |        |
| 36 | SPTx90R1K2                            | Single-N      | 900                     | 4                     | 2                   | --  | 4   | 1.600                   | 1.400 | 14.5                     | 587                        | *               | *       | *      | *      |        |        |       |        |



# SJ MOSFET Multi-EPI



| SN | Part Number<br>"x" means package code | Configuration | Parameter               |                       |                     |     |     |                          |     |                          |                | Typical Package |         |        |        |        |        |       |        |
|----|---------------------------------------|---------------|-------------------------|-----------------------|---------------------|-----|-----|--------------------------|-----|--------------------------|----------------|-----------------|---------|--------|--------|--------|--------|-------|--------|
|    |                                       |               | V <sub>DSS</sub><br>(V) | I <sub>D</sub><br>(A) | V <sub>th</sub> , V |     |     | R <sub>DS(on)</sub> (mΩ) |     | Q <sub>g,nc</sub><br>Typ | Ciss PF<br>Typ | TO-220          | TO-220F | TO-251 | TO-252 | TO-262 | TO-263 | TO-3P | TO-247 |
|    |                                       |               | Min                     | Typ                   | Max                 | Max | Typ | Typ                      | Typ | P                        | A              | U               | D       | L      | B      | W      | F      |       |        |
| 1  | SPTx60R090E                           | Single-N      | 600                     | 47                    | 2.5                 | --  | 4.5 | 90                       | 70  | 75                       | 3900           |                 | *       |        |        |        |        | *     |        |
| 2  | SPTx60R090EFD                         | with FRD      | 600                     | 47                    | 3.0                 | --  | 5.0 | 90                       | 80  | 75                       | 3900           |                 |         |        |        |        |        | *     |        |
| 3  | SPTx60R150E                           | Single-N      | 600                     | 20                    | 2.5                 | --  | 4.5 | 150                      | 120 | 48                       | 1966           |                 | *       |        |        |        |        |       |        |
| 4  | SPTx60R130E                           | Single-N      | 600                     | 25                    | 2.5                 | --  | 4.5 | 150                      | 110 | 48                       | 1966           |                 | *       |        |        |        |        | *     |        |
| 5  | SPTx60R180EFD                         | with FRD      | 600                     | 20                    | 3.0                 | --  | 5.0 | 180                      | 140 | 48                       | 1966           |                 | *       |        |        |        |        |       |        |
| 6  | SPTx60R190E                           | Single-N      | 600                     | 20                    | 2.5                 | --  | 4.5 | 210                      | 180 | 35.7                     | 1354           |                 | *       |        |        |        |        |       |        |
| 7  | SPTx60R220E                           | Single-N      | 600                     | 18                    | 2.5                 | --  | 4.5 | 220                      | 180 | 35.7                     | 1354           |                 | *       |        |        |        |        |       |        |
| 8  | SPTx60R550E                           | Single-N      | 600                     | 8                     | 2.5                 | --  | 4.5 | 550                      | 480 | 10.7                     | 380            |                 | *       |        |        |        |        |       |        |
| 9  | SPTx60R580E                           | Single-N      | 600                     | 8                     | 2.5                 | --  | 4.5 | 580                      | 480 | 24                       | 550            |                 | *       |        |        |        |        |       |        |
| 10 | SPTx60R820E                           | Single-N      | 600                     | 5                     | 2.5                 | --  | 4.5 | 840                      | 740 | 10.7                     | 380            |                 | *       |        |        |        |        |       |        |
| 11 | SPTx6SR090E                           | Single-N      | 650                     | 47                    | 2.5                 | --  | 4.5 | 90                       | 72  | 75                       | 3900           |                 | *       |        |        |        |        | *     |        |
| 12 | SPTx6SR09SEFD                         | with FRD      | 650                     | 47                    | 3.0                 | --  | 5.0 | 95                       | 82  | 75                       | 3900           |                 |         |        |        |        |        | *     |        |
| 13 | SPTx6SR130E                           | Single-N      | 650                     | 25                    | 2.5                 | --  | 4.5 | 150                      | 120 | 48                       | 1966           |                 | *       |        |        |        |        |       |        |
| 14 | SPTx6SR160E                           | Single-N      | 650                     | 20                    | 2.5                 | --  | 4.5 | 160                      | 130 | 48                       | 1966           |                 | *       |        |        |        |        |       |        |
| 15 | SPTx6SR190EFD                         | with FRD      | 650                     | 20                    | 3.0                 | --  | 5.0 | 190                      | 140 | 48                       | 966            |                 | *       |        |        |        |        |       |        |
| 16 | SPTx6SR220E                           | Single-N      | 650                     | 18                    | 2.5                 | --  | 4.5 | 220                      | 190 | 30                       | 1400           | *               | *       |        |        |        |        |       |        |
| 17 | SPTx6SR350E                           | Single-N      | 650                     | 12                    | 2.5                 | --  | 4.5 | 350                      | 320 | 11                       | 380            |                 | *       | *      | *      |        |        |       |        |
| 18 | SPTx6SR550E                           | Single-N      | 650                     | 8                     | 2.5                 | --  | 4.5 | 550                      | 500 | 8.0                      | 550            |                 | *       | *      | *      |        |        |       |        |
| 19 | SPTx6SR850E                           | Single-N      | 650                     | 5                     | 2.5                 | --  | 4.5 | 850                      | 750 | 11                       | 380            |                 | *       | *      | *      |        |        |       |        |
| 20 | SPTx70R390E                           | Single-N      | 700                     | 15                    | 2.8                 | --  | 4.2 | 380                      | 340 | 15.6                     | 562            | *               | *       | *      | *      |        |        |       |        |
| 21 | SPTx70R600E                           | Single-N      | 700                     | 11                    | 2.5                 | --  | 4.5 | 600                      | 540 | 16                       | 560            |                 | *       |        |        |        |        |       |        |
| 22 | SPTx70R950E                           | Single-N      | 700                     | 6                     | 2.5                 | --  | 4.5 | 950                      | 870 | 11                       | 360            |                 | *       |        |        |        |        |       |        |
| 23 | SPTx60R090MFD                         | with FRD      | 600                     | 47                    | 3.0                 | --  | 5.0 | 90                       | 77  | 75                       | 4500           |                 |         |        |        |        |        | *     |        |
| 24 | SPTx60R099M                           | Single-N      | 600                     | 30.7                  | 2.0                 | --  | 4.0 | 99                       | 86  | 75                       | 3300           |                 |         |        |        |        |        | *     |        |
| 25 | SPTx60R180M                           | Single-N      | 600                     | 20                    | 2.0                 | --  | 4.0 | 190                      | 160 | 40                       | 1750           |                 | *       |        |        |        |        | *     |        |
| 26 | SPTx60R190M                           | Single-N      | 600                     | 20                    | 2.0                 | --  | 4.0 | 190                      | 165 | 40                       | 1750           |                 | *       |        |        |        |        | *     |        |
| 27 | SPTx60R350M                           | Single-N      | 600                     | 12                    | 2.0                 | --  | 4.0 | 350                      | 320 | 17                       | 700            | *               | *       | *      | *      |        |        |       |        |
| 28 | SPTx6SR100MFD                         | with FRD      | 650                     | 47                    | 3.0                 | --  | 5.0 | 100                      | 88  | 75                       | 3600           |                 |         |        |        |        |        | *     |        |
| 29 | SPTx6SR380M                           | Single-N      | 650                     | 11                    | 2.0                 | --  | 4.0 | 380                      | 340 | 20                       | 700            | *               | *       | *      | *      |        |        |       |        |
| 30 | SPTx6SR950M                           | Single-N      | 650                     | 4.8                   | 2.0                 | --  | 4.0 | 950                      | 870 | 9.3                      | 390            | *               | *       | *      | *      |        |        |       |        |
| 31 | SPTx70R430M                           | Single-N      | 700                     | 11                    | 2.0                 | --  | 4.0 | 420                      | 365 | 22.6                     | 990            |                 | *       |        |        |        |        |       |        |

\* 产品持续开发中

\* Multi-EPI Super Junction MOSFET多层外延超结场效应管是一种新型功率器件。

采用基于电荷平衡的器件结构,导通电阻与栅电荷明显下降,在应用中可减小系统功率损耗并提高其转换效率。

多层外延超结场效应管具有更好的产品特性一致性以及更优的雪崩能力和EMI性能。

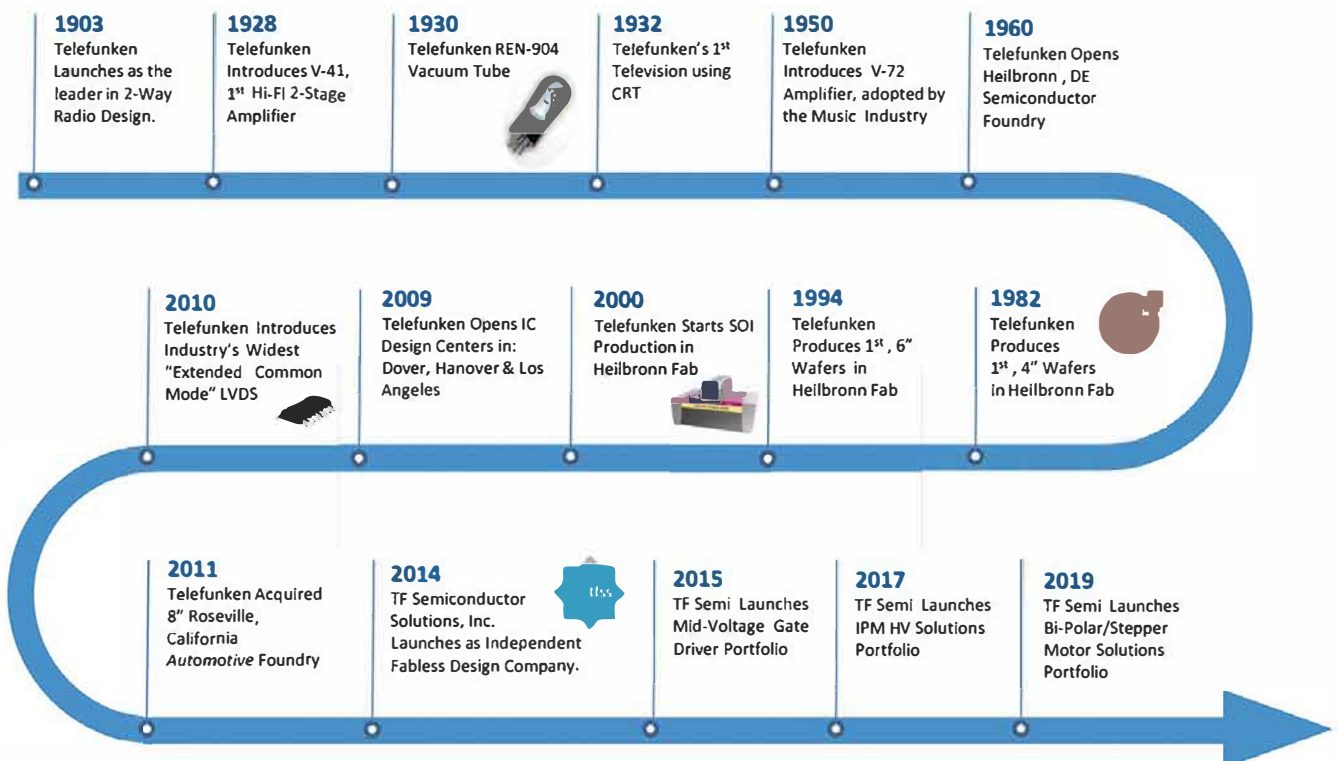


# TF Semiconductor Solutions

(重要战略关系伙伴)

World first-level wafer fab, verify qualified automotive electronics technology with main products consist of smart power supply management, power MOSFET and high-frequency IC.

## TF Semiconductor Solutions



# High Voltage Gate Driver ICs



## Single Phase

| Part     | Name                               | IO+/IO-     | Inputs     | Deadtime   | ton/toff    | tr/td      | Package                  |
|----------|------------------------------------|-------------|------------|------------|-------------|------------|--------------------------|
| TF2101M  | 600V High-Side/Low-Side Gate Drive | 290mA/600mA | HIN/LIN    | none       | 160ns/150ns | 70ns/35ns  | SOIC14(N)/SOIC8(N)/PDIP8 |
| TF2103M  | 600V Half-Bridge Gate Driver       | 290mA/600mA | HIN/LIN*   | 520ns      | 680ns/150ns | 70ns/35ns  | SOIC8(N)/PDIP8           |
| TF2103A  | 600V Half-Bridge Gate Driver       | 210mA/360mA | HIN/LIN*   | 520ns      | 680ns/150ns | 100ns/50ns | SOIC8(N)/PDIP8           |
| TF2104M  | 600V Half-Bridge Gate Driver       | 290mA/600mA | IN/SD*     | 520ns      | 680ns/150ns | 70ns/35ns  | SOIC8(N)/PDIP8           |
| TF2104A  | 600V Half-Bridge Gate Driver       | 210mA/360mA | IN/SD*     | 520ns      | 680ns/150ns | 100ns/50ns | SOIC8(N)/PDIP8           |
| TF2190M  | 600V High-Side/Low-Side Gate Drive | 4.5A/4.5A   | HIN/LIN    | none       | 140ns/140ns | 25ns/20ns  | SOIC8(N)                 |
| TF21904M | 600V High-Side/Low-Side Gate Drive | 4.5A/4.5A   | HIN/LIN    | none       | 140ns/140ns | 25ns/20ns  | SOIC14(N)                |
| TF2110M  | 600V High-Side/Low-Side Gate Drive | 2.5A/2.5A   | HIN/LIN/SD | none       | 120ns/90ns  | 25ns/17ns  | SOIC16(W)/PDIP14         |
| TF2113M  | 600V High-Side/Low-Side Gate Drive | 2.5A/2.5A   | HIN/LIN/SD | none       | 120ns/90ns  | 25ns/17ns  | SOIC16(W)/PDIP14         |
| TF2184M  | 600V Half-Bridge Gate Driver       | 1.9A/2.3A   | IN/SD*     | 400ns      | 680ns/270ns | 40ns/20ns  | SOIC8(N)/PDIP8           |
| TF21844M | 600V Half-Bridge Gate Driver       | 1.9A/2.3A   | IN/SD*     | 400ns -5ms | 680ns/270ns | 40ns/20ns  | SOIC14(N)/PDIP14         |
| TF2181M  | 600V High-Side/Low-Side Gate Drive | 1.9A/2.3A   | HIN/LIN    | none       | 180ns/220ns | 40ns/20ns  | SOIC8(N)/PDIP8           |
| TF21814M | 600V High-Side/Low-Side Gate Drive | 1.9A/2.3A   | HIN/LIN    | none       | 180ns/220ns | 40ns/20ns  | SOIC14(N)/PDIP14         |
| TF2304M  | 600V Half-Bridge Gate Drive        | 290mA/600mA | HIN/LIN    | 100ns      | 150ns/150ns | 70ns/35ns  | SOIC8(N)/PDIP8           |
| TF2117   | 600V Single Channel Driver         | 290mA/600mA | IN         | none       | 160ns/125ns | 75ns/35ns  | SOIC8(N)/PDIP8           |
| TF2118   | 600V Single Channel Driver         | 290mA/600mA | IN*        | none       | 160ns/125ns | 75ns/35ns  | SOIC8(N)/PDIP8           |
| TF2106M  | 600V High-Side/Low-Side Gate Drive | 290mA/600mA | HIN/LIN    | none       | 220ns/200ns | 100ns/35ns | SOIC8(N)/PDIP8           |
| TF21064M | 600V High-Side/Low-Side Gate Drive | 200mA/600mA | HIN/LIN    | none       | 220ns/200ns | 100ns/35ns | SOIC14(N)/PDIP14         |
| TF2108M  | 600V Half-Bridge Gate Driver       | 290mA/600mA | HIN/LIN*   | 540ns      | 220ns/200ns | 100ns/35ns | SOIC8(N)/PDIP8           |
| TF21084M | 600V Half-Bridge Gate Driver       | 200mA/600mA | HIN/LIN*   | 540ns-5ms  | 220ns/200ns | 100ns/35ns | SOIC14(N)/PDIP14         |

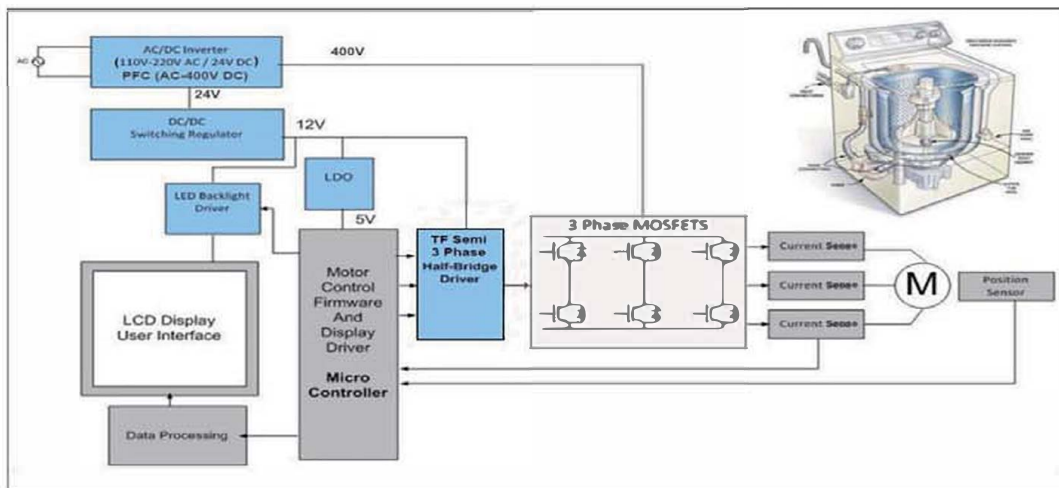


# High Voltage Gate Driver ICs



## Three Phase

| Part    | Name                                | IO +/IO-    | Inputs             | Deadtime | ton/toff    | tr/td     | Package |
|---------|-------------------------------------|-------------|--------------------|----------|-------------|-----------|---------|
| TF23892 | 600V 3-Phase HalfBridge Gate Driver | 350mA/650mA | HIN*(x3), LIN*(x3) | 290ns    | 270ns/270ns | 40ns/25ns | SOIC28  |
| TF2136M | 600V 3-Phase HalfBridge Gate Driver | 200mA/350mA | HIN*(x3), LIN*(x3) | 290ns    | 330ns/330ns | 90ns/35ns | SOIC28  |
| TF2135M | 600V 3-Phase HalfBridge Gate Driver | 200mA/350mA | HIN*(x3), LIN*(x3) | 290ns    | 330ns/330ns | 90ns/35ns | SOIC28  |
| TF2388M | 600V 3-Phase HalfBridge Gate Driver | 350mA/650mA | HIN(x3), LIN(x3)   | 270ns    | 130ns/150ns | 50ns/35ns | SOIC20  |



# Mid Voltage Gate Driver ICs



## Single Phase

| Part    | Name                                | IO+/IO-     | Inputs   | Deadtime | ton/toff    | tr/tf      | Package        |
|---------|-------------------------------------|-------------|----------|----------|-------------|------------|----------------|
| TF05791 | 100V High-Side/Low-Side Gate Driver | 1.5A/2.0A   | HIN/LIN  | none     | 80ns/80ns   | 15ns/10ns  | TDFN-10        |
| TF0503  | 100V Half-Bridge Gate Driver        | 290mA/600mA | HIN/LIN* | 520ns    | 680ns/150ns | 70ns/35ns  | TDFN-10        |
| TF0504  | 100V Half-Bridge Gate Driver        | 290mA/600mA | IN/SD*   | 520ns    | 680ns/150ns | 70ns/35ns  | TDFN-10        |
| TF0581  | 100V High-Side/Low-Side Gate Driver | 1.9A/2.3A   | HIN/LIN  | none     | 180ns/220ns | 40ns/20ns  | TDFN-10        |
| TF0584  | 100V Half-Bridge Gate Driver        | 1.9A/2.3A   | IN/SD*   | 400ns    | 680ns/270ns | 40ns/20ns  | TDFN-10        |
| TF1304  | 250V Half-Bridge Gate Drive         | 290mA/600mA | HIN/LIN  | 100ns    | 150ns/150ns | 70ns/35ns  | SOIC8(N)/PDIP8 |
| TF1503  | 250V Half-Bridge Gate Driver        | 290mA/600mA | HIN/LIN* | 520ns    | 680ns/150ns | 70ns/35ns  | SOIC8(N)       |
| TF1504  | 250V Half-Bridge Gate Driver        | 290mA/600mA | IN/SD*   | 520ns    | 680ns/150ns | 70ns/35ns  | SOIC8(N)       |
| TF1581  | 250V High-Side/Low-Side Gate Driver | 1.9A/2.3A   | HIN/LIN  | none     | 180ns/220ns | 40ns/20ns  | SOIC8(N)       |
| TF1584  | 250V Half-Bridge Gate Driver        | 1.9A/2.3A   | IN/SD*   | 400ns    | 680ns/270ns | 40ns/20ns  | SOIC8(N)       |
| TF2003M | 200V Half-Bridge Gate Driver        | 290mA/600mA | HIN/LIN* | 420ns    | 680ns/150ns | 70ns/35ns  | SOIC8(N)       |
| TF2005M | 200V High-Side/Low-Side Gate Driver | 290mA/600mA | HIN/LIN  | none     | 220ns/200ns | 100ns/35ns | SOIC8(N)       |
| TF2007M | 200V Half-Bridge Gate Driver        | 290mA/600mA | HIN/LIN  | 420ns    | 100ns/100ns | 70ns/35ns  | SOIC8(N)       |
| TF2011M | 200V High-Side/Low-Side Gate Driver | 290mA/600mA | HIN/LIN  | none     | 120ns/120ns | 30ns/30ns  | SOIC8(N)       |
| TF2012M | 200V High-Side/Low-Side Gate Driver | 290mA/600mA | HIN/LIN  | none     | 180ns/200ns | 40ns/20ns  | SOIC8(N)       |



# Mid Voltage Gate Driver ICs



## Three Phase Gate Drivers & Stepper Motor Controller

| Part   | Name                                | IO+ / IO-   | Inputs             | Deadtime | ton/toff    | tr/ tf     | Package |
|--------|-------------------------------------|-------------|--------------------|----------|-------------|------------|---------|
| TF1692 | 250V 3-Phase HalfBridge Gate Driver | 350mA/650mA | HIN*(x3), LIN*(x3) | 290ns    | 500ns/500ns | 50ns/30ns  | SOIC28  |
| TF0692 | 100V 3-Phase HalfBridge Gate Driver | 350mA/650mA | HIN*(x3), LIN*(x3) | 290ns    | 500ns/500ns | 50ns/30ns  | SOIC28  |
| TF1636 | 250V 3-Phase HalfBridge Gate Drive  | 200mA/350mA | HIN*(x3), LIN*(x3) | 290ns    | 500ns/500ns | 125ns/50ns | SOIC28  |
| TF0636 | 100V 3-Phase HalfBridge Gate Drive  | 200mA/350mA | HIN*(x3), LIN*(x3) | 290ns    | 500ns/500ns | 125ns/50ns | SOIC28  |
| TF2098 | 200V 3-Phase HalfBridge Gate Driver | 350mA/650mA | HIN*(x3), LIN*(x3) | 270ns    | 130ns/150ns | 50ns/35ns  | SOIC20  |



## IPM for 3-Phase Motor Drive

| Part    | Name                                   | IC Each IGBT collector current | V <sub>CE</sub> Collector to emitter voltage | V <sub>CE(SAT)</sub> TYP | Deadtime | ton/toff    | Package |
|---------|--|--------------------------------|--|--------------------------|----------|-------------|---------|
| TFP2815 | 600V, 15A, IPM for 3-Phase Motor Drive | 15A                            | 600V   | 1.8V                     | 1uS      | 0.5us/1.1us | DIP-25P |
| TFP2810 | 600V Half-Bridge Gate Driver           | 10A                            | 600V   | 1.8V                     | 1uS      | 0.7us/0.5us | DIP-25P |

\* 产品持续开发中





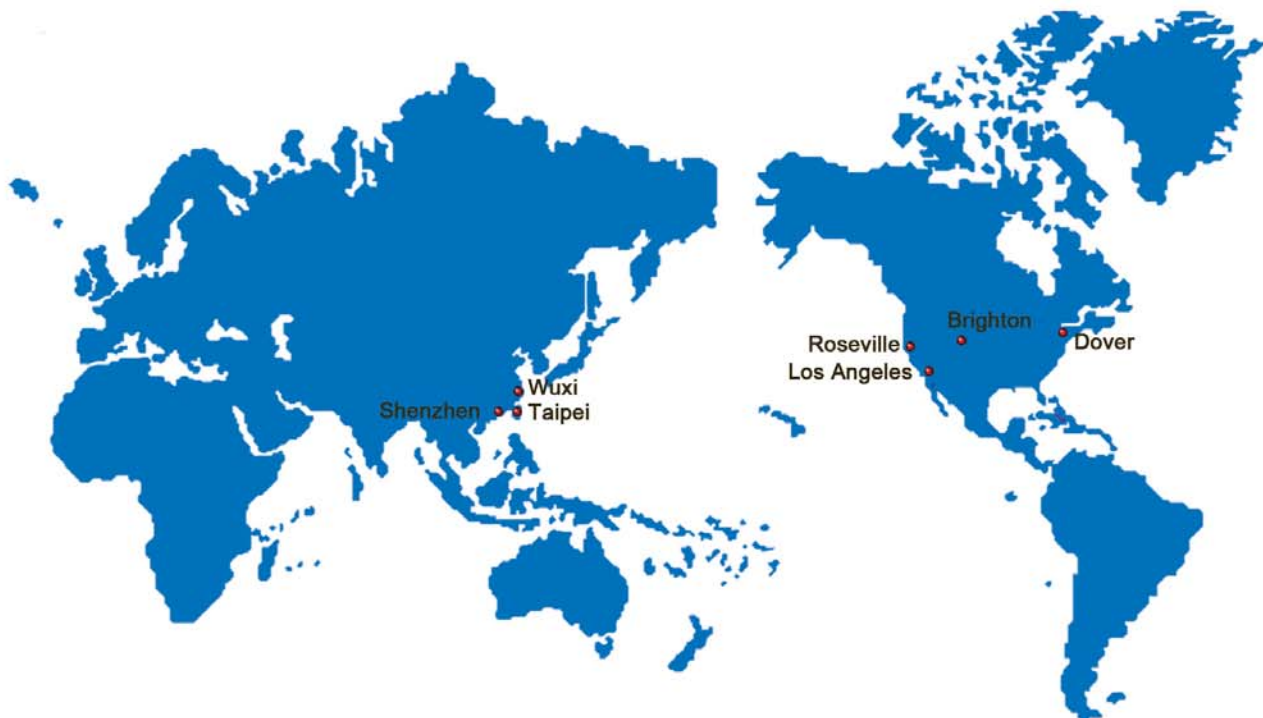
# Cross Reference Guide

| Low Voltage Products                  | TFSS Part Number | A        | B              | Samples | MP |
|---------------------------------------|------------------|----------|----------------|---------|----|
| Low Side, Single Gate Driver          | TF0215           | MIC1415  |                | Now     | ✓  |
| Low Side, Single Gate Driver          | TF0216           | MIC1416  |                | Now     | ✓  |
| Dual Low Side Gate Driver             | TF02271          | TC4427   |                | Now     | ✓  |
| Dual Low Side Gate Driver             | TF02272          | IXY4427  |                | Now     | ✓  |
| Dual Low Side Gate Driver             | TF02273          | IR4427   |                | Now     | ✓  |
| Dual Low Side Gate Driver             | TF02275          |          | UCC27531       | Now     | ✓  |
| Low Side, Single Gate Driver with LDO | TF0280           | FAN3180  |                | Now     | ✓  |
| Low Side, Single Gate Driver with LDO | TF0281           |          | FAN3180        | Now     | ✓  |
| Half Bridge Gate Driver               | TF0507A          |          | MP1907         | Now     | ✓  |
| High Side/Low Side Gate Driver        | TF0579           | MP1907   |                | Q1'19   |    |
| High Side/Low Side Gate Driver        | TF0590           | IDTP9090 |                | Now     | ✓  |
| Mid Voltage Products                  | TFSS Part Number | A        | B              | Samples | MP |
| Half Bridge Gate Driver               | TF2003           | IR2003   |                | Now     | ✓  |
| Half Bridge Gate Driver               | TF2004           | IR2004   |                | Now     | ✓  |
| High Side/Low Side Gate Driver        | TF2005           | IR2005   |                | Now     | ✓  |
| High Side/Low Side Gate Driver        | TF2011           |          | IRS2011        | Now     | ✓  |
| High Side/Low Side Gate Driver        | TF2012           |          | IRS2011        | Now     | ✓  |
| High Voltage Products                 | TFSS Part Number | A        | B              | Samples | MP |
| High-Side/Low-Side Gate Driver        | TF2101M          | IRS2101  | IR2101,FAN7842 | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF2106           | IRS2106  | IR2106         | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF21064          | IRS21064 | IR21064        | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF2110           | IRS2110  | IR2110,FAN7392 | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF2113           | IRS2113  | IR2113,FAN7392 | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF2190           | FAN7390  |                | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF21904          | FAN73904 |                | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF2181           | IRS2181  | IR2181         | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF21814          | IRS21814 | IR21814        | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF2110M          | IRS2110  | IR2110,FAN7392 | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF2113M          | IRS2113  | IR2113,FAN7392 | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF2190M          | FAN7390  |                | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF21904M         | FAN73904 |                | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF2181M          | IRS2181  | IR2181         | Now     | ✓  |
| High-Side/Low-Side Gate Driver        | TF21814M         | IRS21814 | IR21814        | Now     | ✓  |
| Half-Bridge Gate Driver               | TF2103           | IRS2103  | IR2103         | Now     | ✓  |
| Half-Bridge Gate Driver               | TF2104           | IRS2104  | IR2104         | Now     | ✓  |
| Half-Bridge Gate Driver               | TF2103A          | IR2103   | IRS2103        | Now     | ✓  |
| Half-Bridge Gate Driver               | TF2104A          | IR2104   | IRS2104        | Now     | ✓  |
| Half-Bridge Gate Driver               | TF2003           | IRS2003  |                | Now     | ✓  |
| Half-Bridge Gate Driver               | TF2108           | IRS2108  | IR2108         | Now     | ✓  |
| Half-Bridge Gate Driver               | TF21084          | IRS21084 | IR21084        | Now     | ✓  |
| Half-Bridge Gate Driver               | TF2184           | IRS2184  | IR2184         | Now     | ✓  |
| Half-Bridge Gate Driver               | TF21844          | IRS21844 | IR21844        | Now     | ✓  |
| 3-Phase Gate Driver                   | TF2136           | IR2136   |                | Now     | ✓  |
| 3-Phase Gate Driver                   | TF2135           | IR2136   |                | Now     | ✓  |
| 3-Phase Gate Driver                   | TF23892          | FAN73892 |                | Now     | ✓  |

A - Pinout Compatible and Functionally Compatible

B - Pinout Compatible and Functionally Similar

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