

# PolarHT™ Power MOSFET

## IXTK 150N15P IXTQ 150N15P

$$V_{DSS} = 150 \text{ V}$$

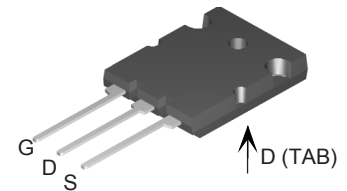
$$I_{D25} = 150 \text{ A}$$

$$R_{DS(on)} \leq 13 \text{ m}\Omega$$

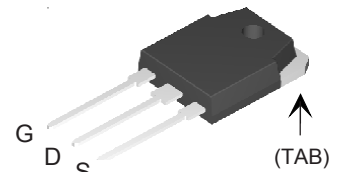
N-Channel Enhancement Mode  
Avalanche Rated



TO-264 (IXTK)



TO-3P (IXTQ)



G = Gate  
S = Source

D = Drain  
TAB = Drain

| Symbol        | Test Conditions   | Maximum Ratings |                  |
|---------------|---|-----------------|------------------|
| $V_{DSS}$     | $T_J = 25^\circ\text{C to } 175^\circ\text{C}$  | 150             | V                |
| $V_{DGR}$     | $T_J = 25^\circ\text{C to } 175^\circ\text{C}; R_{GS} = 1 \text{ M}\Omega$  | 150             | V                |
| $V_{GS}$      | Continuous  | $\pm 20$        | V                |
| $V_{GSM}$     | Transient   | $\pm 30$        | V                |
| $I_{D25}$     | $T_C = 25^\circ\text{C}$  | 150             | A                |
| $I_{D(RMS)}$  | External lead current limit   | 75              | A                |
| $I_{DM}$      | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$  | 340             | A                |
| $I_{AR}$      | $T_C = 25^\circ\text{C}$  | 60              | A                |
| $E_{AR}$      | $T_C = 25^\circ\text{C}$  | 80              | mJ               |
| $E_{AS}$      | $T_C = 25^\circ\text{C}$  | 2.5             | J                |
| $dv/dt$       | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ ,<br>$T_J \leq 175^\circ\text{C}$ , $R_G = 4 \Omega$ | 10              | V/ns             |
| $P_D$         | $T_C = 25^\circ\text{C}$  | 714             | W                |
| $T_J$         |   | -55 ... +175    | $^\circ\text{C}$ |
| $T_{JM}$      |   | 175             | $^\circ\text{C}$ |
| $T_{stg}$     |   | -55 ... +175    | $^\circ\text{C}$ |
| $T_L$         | 1.6 mm (0.062 in.) from case for 10 s   | 300             | $^\circ\text{C}$ |
| $T_{SOLD}$    | Plastic body for 10 s   | 260             | $^\circ\text{C}$ |
| $M_d$         | Mounting torque   | 1.13/10         | Nm/lb.in.        |
| <b>Weight</b> | TO-3P   | 5.5             | g                |
|               | TO-264  | 10              | g                |

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified)                                     | Characteristic Values |      |                      |
|--------------|---|-----------------------|------|----------------------|
|              |   | Min.                  | Typ. | Max.                 |
| $BV_{DSS}$   | $V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$  | 150                   |      | V                    |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 250 \mu\text{A}$   | 3.0                   |      | 5.0 V                |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$   |                       |      | $\pm 100 \text{ nA}$ |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$  |                       |      | 25 $\mu\text{A}$     |
|              | $V_{GS} = 0 \text{ V}$  |                       |      | 500 $\mu\text{A}$    |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$ , $I_D = 0.5 I_{D25}$<br>Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2\%$ |                       |      | 13 $\text{m}\Omega$  |

### Features

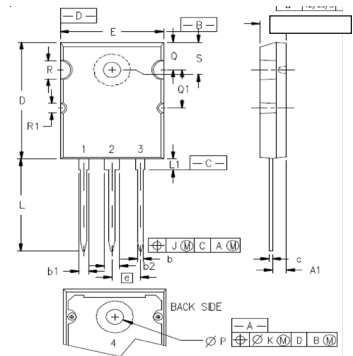
- † International standard packages
- † Unclamped Inductive Switching (UIS) rated
- † Low package inductance  
- easy to drive and to protect

### Advantages

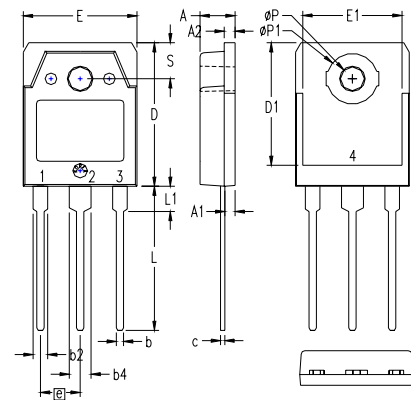
- † Easy to mount
- † Space savings
- † High power density

| Symbol       | Test Conditions   | Characteristic Values  |      |                        |
|--------------|---|--|------|------------------------|
|              |   | $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ |      |                        |
|              |   | Min.   | Typ. | Max.                   |
| $g_{fs}$     | $V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}, \text{ pulse test}$   | 55   | 80   | S                      |
| $C_{iss}$    | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$   |  | 5800 | pF                     |
| $C_{oss}$    |   |  | 1730 | pF                     |
| $C_{rss}$    |   |  | 400  | pF                     |
| $t_{d(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_{D25}$<br>$R_G = 3.3\ \Omega \text{ (External)}$ |  | 30   | ns                     |
| $t_r$        |   |  | 33   | ns                     |
| $t_{d(off)}$ |   |  | 100  | ns                     |
| $t_f$        |   |  | 28   | ns                     |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$                                       |  | 190  | nC                     |
| $Q_{gs}$     |   |  | 40   | nC                     |
| $Q_{gd}$     |   |  | 105  | nC                     |
| $R_{thJC}$   |   |  |      | $0.21^\circ\text{C/W}$ |
| $R_{thCK}$   | TO-3P   |  | 0.21 | $^\circ\text{C/W}$     |
| $R_{thCS}$   | TO-264  |  | 0.15 | $^\circ\text{C/W}$     |

| Symbol   | Test Conditions  | Characteristic Values  |      |       |
|----------|--|--|------|-------|
|          |  | $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ |      |       |
|          |  | Min.   | Typ. | Max.  |
| $I_s$    | $V_{GS} = 0\text{ V}$  |  |      | 150 A |
| $I_{SM}$ | Repetitive   |  |      | 340 A |
| $V_{SD}$ | $I_F = I_s, V_{GS} = 0\text{ V},$<br>Pulse test, $t \leq 300\ \mu\text{s}, \text{ duty cycle } d \leq 2\%$ |  |      | 1.5 V |
| $t_{rr}$ | $I_F = 25\text{ A}$<br>$-di/dt = 100\text{ A}/\mu\text{s}$   |  | 150  | ns    |
| $Q_{RM}$ |  | $V_R = 100\text{ V}, V_{GS} = 0\text{ V}$                      |      | 2.3   |

**TO-264 (IXTK) Outline**


| SYM       | INCHES   |       | MILLIMETERS |       |
|-----------|----------|-------|-------------|-------|
|           | MIN      | MAX   | MIN         | MAX   |
| A         | .185     | .209  | 4.70        | 5.31  |
| A1        | .102     | .118  | 2.59        | 3.00  |
| b         | .037     | .055  | 0.94        | 1.40  |
| b1        | .087     | .102  | 2.21        | 2.59  |
| b2        | .110     | .126  | 2.79        | 3.20  |
| c         | .017     | .029  | 0.43        | 0.74  |
| D         | 1.007    | 1.047 | 25.58       | 26.59 |
| E         | .760     | .799  | 19.30       | 20.29 |
| e         | .215 BSC |       | 5.46 BSC    |       |
| J         | .000     | .010  | 0.00        | 0.25  |
| K         | .000     | .010  | 0.00        | 0.25  |
| L         | .779     | .842  | 19.79       | 21.39 |
| L1        | .087     | .102  | 2.21        | 2.59  |
| $\phi P$  | .122     | .138  | 3.10        | 3.51  |
| Q         | .240     | .256  | 6.10        | 6.50  |
| Q1        | .330     | .346  | 8.38        | 8.79  |
| $\phi R$  | .155     | .187  | 3.94        | 4.75  |
| $\phi R1$ | .085     | .093  | 2.16        | 2.36  |
| S         | .243     | .253  | 6.17        | 6.43  |

**TO-3P (IXTQ) Outline**


| SYM       | INCHES   |      | MILLIMETERS |       |
|-----------|----------|------|-------------|-------|
|           | MIN      | MAX  | MIN         | MAX   |
| A         | .185     | .193 | 4.70        | 4.90  |
| A1        | .051     | .059 | 1.30        | 1.50  |
| A2        | .057     | .065 | 1.45        | 1.65  |
| b         | .035     | .045 | 0.90        | 1.15  |
| b2        | .075     | .087 | 1.90        | 2.20  |
| b4        | .114     | .126 | 2.90        | 3.20  |
| c         | .022     | .031 | 0.55        | 0.80  |
| D         | .780     | .799 | 19.80       | 20.30 |
| D1        | .665     | .677 | 16.90       | 17.20 |
| E         | .610     | .622 | 15.50       | 15.80 |
| E1        | .531     | .539 | 13.50       | 13.70 |
| e         | .215 BSC |      | 5.45 BSC    |       |
| L         | .779     | .795 | 19.80       | 20.20 |
| L1        | .134     | .142 | 3.40        | 3.60  |
| $\phi P$  | .126     | .134 | 3.20        | 3.40  |
| $\phi P1$ | .272     | .280 | 6.90        | 7.10  |
| S         | .193     | .201 | 4.90        | 5.10  |

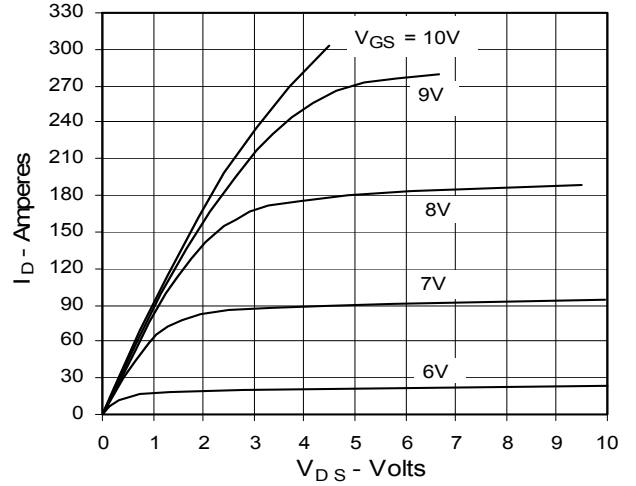
IXYS reserves the right to change limits, test conditions, and dimensions.

|  |           |           |           |           |              |              |             |              |
|--|-----------|-----------|-----------|-----------|--------------|--------------|-------------|--------------|
| IXYS MOSFETs and IGBTs are covered by      | 4,835,592 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665    | 6,404,065 B1 | 6,683,344   | 6,727,585    |
| one or more of the following U.S. patents: | 4,850,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343    | 6,710,405B2 | 6,759,692    |
|  | 4,881,106 | 5,034,796 | 5,187,117 | 5,486,715 | 6,306,728 B1 | 6,583,505    | 6,710,463   | 6,771,478 B2 |

**Fig. 1. Output Characteristics**  
**@ 25°C**



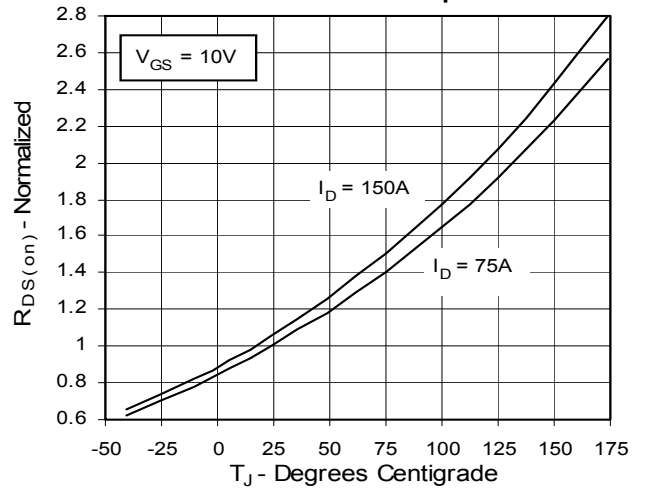
**Fig. 2. Extended Output Characteristics**  
**@ 25°C**



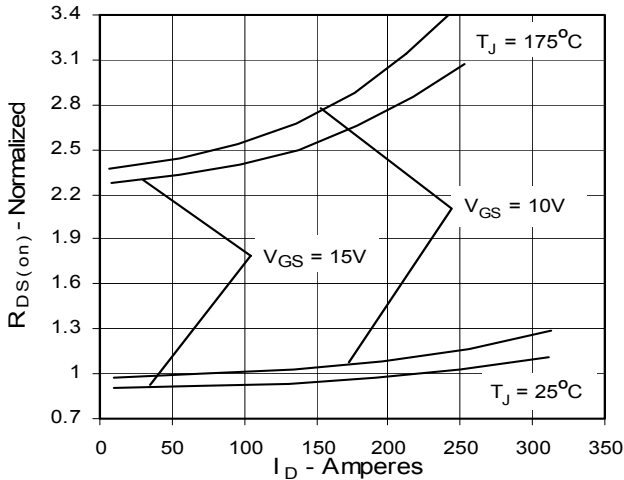
**Fig. 3. Output Characteristics**  
**@ 150°C**



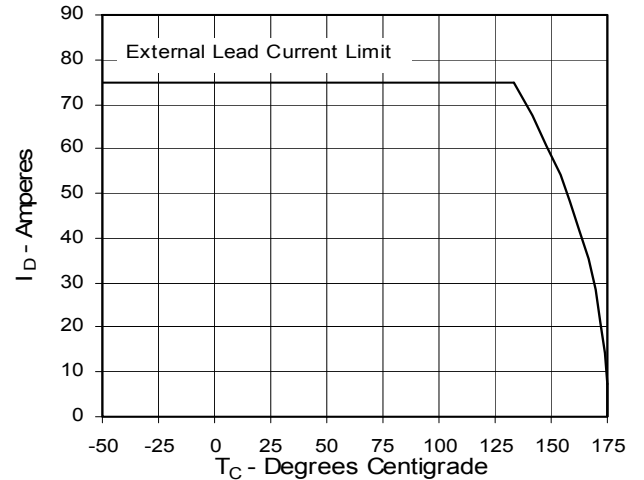
**Fig. 4.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Junction Temperature**



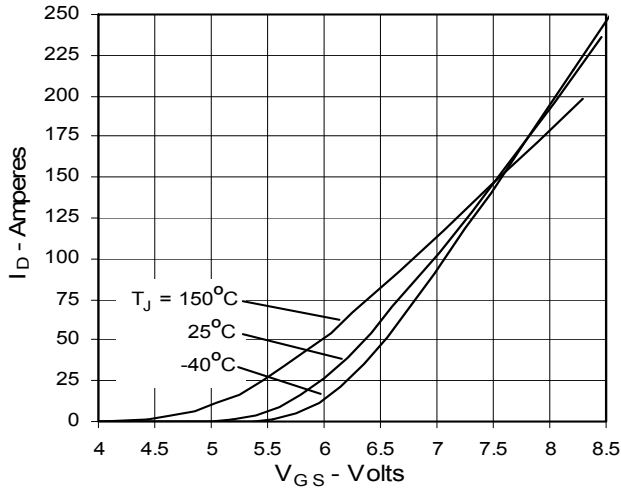
**Fig. 5.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Drain Current**



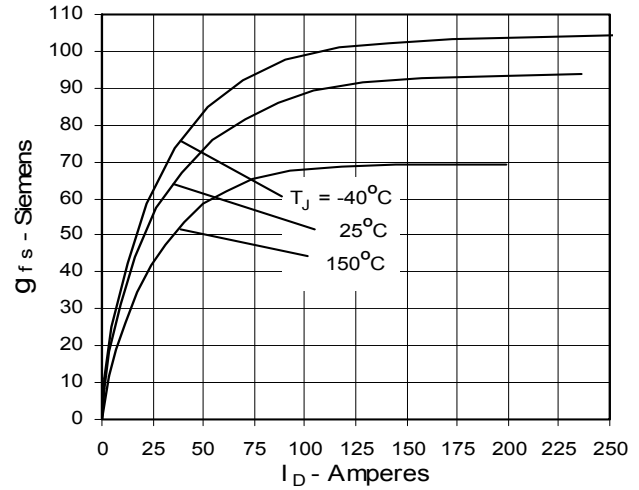
**Fig. 6. Drain Current vs. Case Temperature**



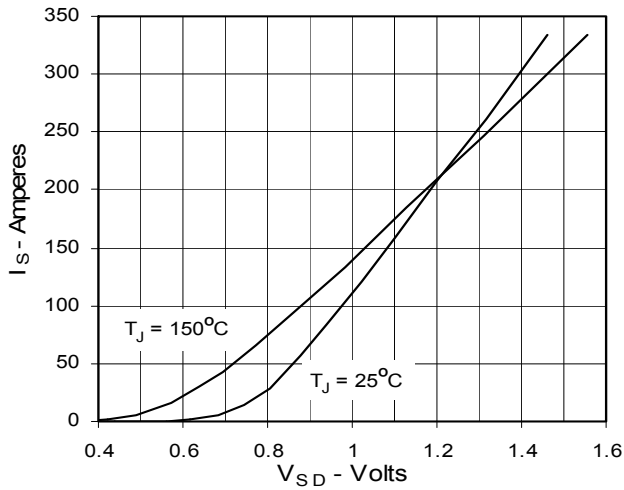
**Fig. 7. Input Admittance**



**Fig. 8. Transconductance**



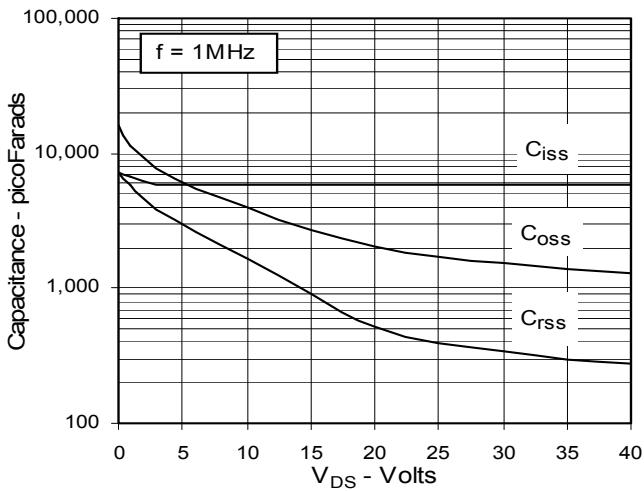
**Fig. 9. Source Current vs. Source-To-Drain Voltage**



**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



**Fig. 12. Forward-Bias Safe Operating Area**

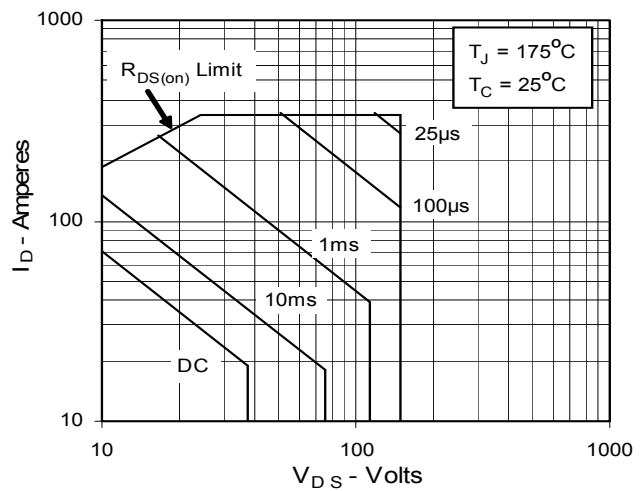
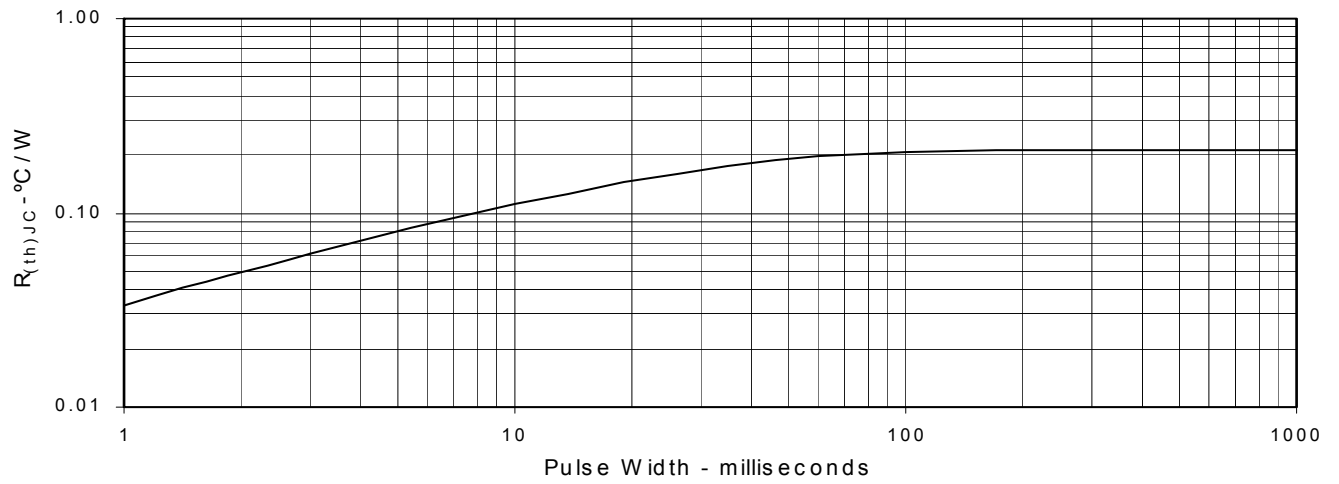


Fig. 13. Maximum Transient Thermal Resistance





---

Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [MOSFET](#) category:*

*Click to view products by [IXYS](#) manufacturer:*

Other Similar products are found below :

[614233C](#) [648584F](#) [IRFD120](#) [JANTX2N5237](#) [FCA20N60\\_F109](#) [FDZ595PZ](#) [2SK2545\(Q,T\)](#) [405094E](#) [423220D](#) [TPCC8103,L1Q\(CM](#)  
[MIC4420CM-TR](#) [VN1206L](#) [614234A](#) [715780A](#) [NTNS3166NZT5G](#) [SSM6J414TU,LF\(T](#) [751625C](#) [BUK954R8-60E](#) [NTE6400](#) [SQJ402EP-](#)  
[T1-GE3](#) [2SK2614\(TE16L1,Q\)](#) [2N7002KW-FAI](#) [DMN1017UCP3-7](#) [EFC2J004NUZTDG](#) [ECH8691-TL-W](#) [FCAB21350L1](#) [P85W28HP2F-](#)  
[7071](#) [DMN1053UCP4-7](#) [NTE221](#) [NTE222](#) [NTE2384](#) [NTE2903](#) [NTE2941](#) [NTE2945](#) [NTE2946](#) [NTE2960](#) [NTE2967](#) [NTE2969](#) [NTE2976](#)  
[NTE6400A](#) [NTE2910](#) [NTE2916](#) [NTE2956](#) [NTE2911](#) [DMN2080UCB4-7](#) [TK10A80W,S4X\(S](#) [SSM6P69NU,LF](#) [DMP22D4UFO-7B](#)  
[DMN1006UCA6-7](#) [DMN16M9UCA6-7](#)