

Features

- Super Junction technology for High Voltage Application
- Ultra Low Gate Charge Cause Lower Driving Requirement
- Low On-resistance and Low Conduction Loss
- Moisture Sensitivity Level 3
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free."Green "Device^(Note 1)
- Lead Free Finish/RoHS Compliant.^(Note 2) ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

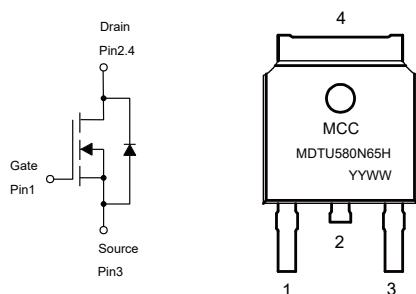
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 50°C/W Junction to Ambient^(Note 3)
- Thermal Resistance: 1.9°C/W Junction to Case

| Parameter | Symbol | Value | Unit |
|---|----------|----------|------|
| Drain-Source Voltage | V_{DS} | 650 | V |
| Gate-Source Voltage | V_{GS} | ± 30 | V |
| Continuous Drain Current | I_D | 6.5 | A |
| | | 4.1 | |
| Pulsed Drain Current ^(Note 4) | I_{DM} | 26 | A |
| Total Power Dissipation ^(Note 5) | P_D | 65 | W |
| Single Avalanche Energy ^(Note 6) | E_{AS} | 135 | mJ |

Note:

1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High temperature solder exemption applied, see EU directive annex 7(a)-l.
3. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ C$.
4. Repetitive rating; pulse width limited by max. junction temperature.
5. P_D is based on max. junction temperature, using junction-case thermal resistance.
6. $T_J=25^\circ C, V_{DD}=100V, V_{GS}=10V, R_G=2.5\Omega, L=30mH$.

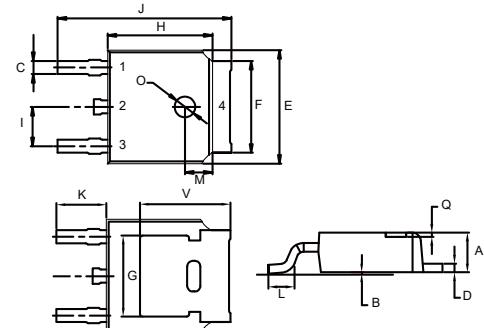
Internal Structure and Marking Code



4 codes in total
YY is the year
WW is the week

N-CHANNEL Super-Junction Power MOSFET

DPAK(TO-252)

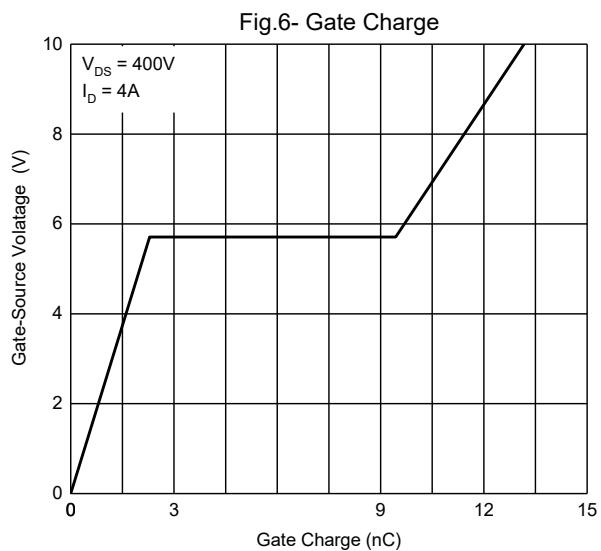
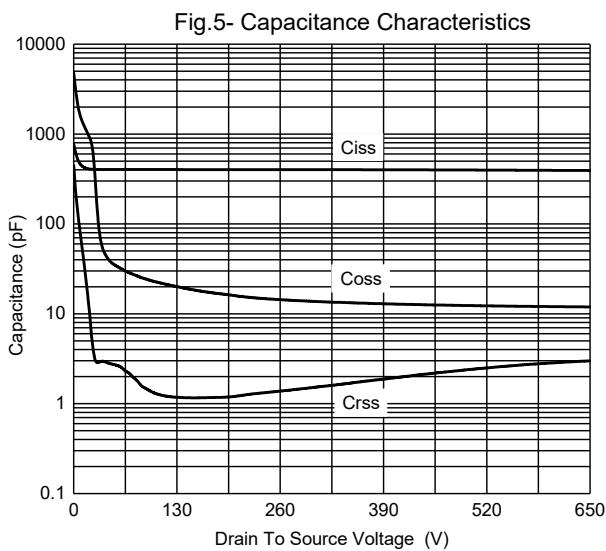
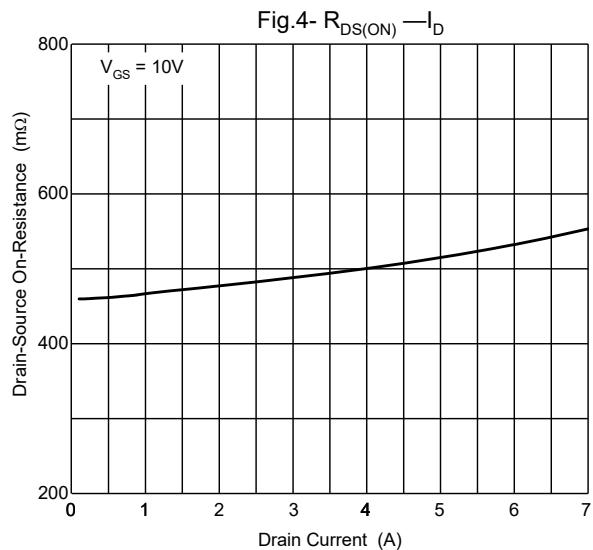
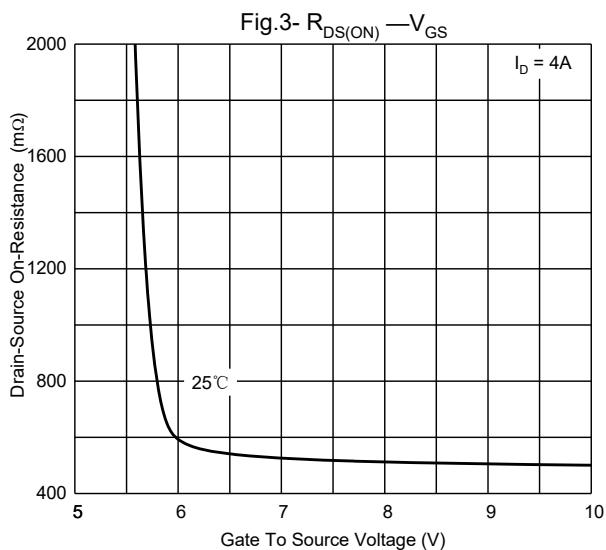
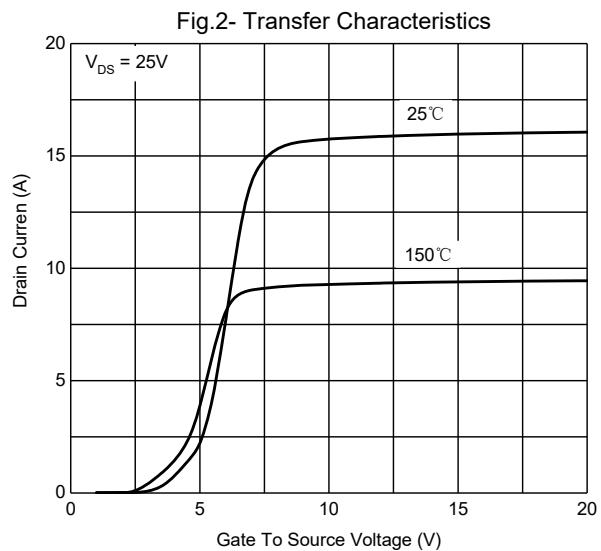
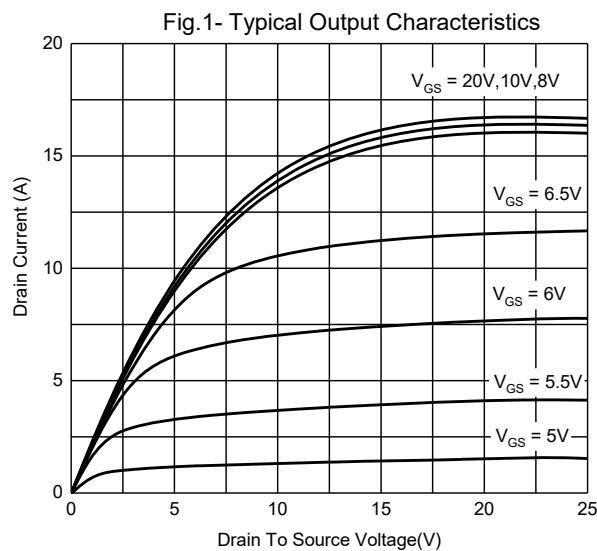


| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|------|-------|------|
| | MIN | MAX | MIN | MAX | |
| A | 0.087 | 0.094 | 2.20 | 2.40 | |
| B | 0.000 | 0.005 | 0.00 | 0.13 | |
| C | 0.026 | 0.034 | 0.66 | 0.86 | |
| D | 0.018 | 0.023 | 0.46 | 0.58 | |
| E | 0.256 | 0.264 | 6.50 | 6.70 | |
| F | 0.201 | 0.215 | 5.10 | 5.46 | |
| G | 0.190 | | 4.83 | | TYP. |
| H | 0.236 | 0.244 | 6.00 | 6.20 | |
| I | 0.086 | 0.094 | 2.18 | 2.39 | |
| J | 0.386 | 0.409 | 9.80 | 10.40 | |
| K | 0.114 | | 2.90 | | TYP. |
| L | 0.055 | 0.067 | 1.40 | 1.70 | |
| M | 0.063 | | 1.60 | | TYP. |
| O | 0.043 | 0.051 | 1.10 | 1.30 | |
| Q | 0.000 | 0.012 | 0.00 | 0.30 | |
| V | 0.211 | | 5.35 | | TYP. |

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|-------------------------------------|---------------|--|-----|------|-----------|-----------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 650 | | | V |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 30V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=650V, V_{GS}=0V$ | | | 1 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2.5 | 3.5 | 4.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=4A$ | | 500 | 580 | $m\Omega$ |
| Gate Resistance | R_G | f=1MHz, Open Drain | | 5.5 | | Ω |
| Diode Characteristics | | | | | | |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=4A$ | | | 1.2 | V |
| Reverse Recovery Time | t_{rr} | $V_R=400V, I_F=4A$ $dI_F/dt=100A/\mu s$ | | 171 | | ns |
| Reverse Recovery Charge | Q_{rr} | | | 1440 | | nC |
| Peak Reverse Recovery Current | I_{rrm} | | | 17.2 | | A |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=400V, V_{GS}=0V, f=1MHz$ | | 400 | | pF |
| Output Capacitance | C_{oss} | | | 12.9 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 1.9 | | |
| Output capacitance - energy related | $C_{o(er)}$ | | | 20 | | |
| Output capacitance - time related | $C_{o(tr)}$ | | | 113 | | |
| Total Gate Charge | Q_g | $V_{DS}=400V, V_{GS}=10V, I_D=4A$ | | 13.2 | | nC |
| Gate-Source Charge | Q_{gs} | | | 2.3 | | |
| Gate-Drain Charge | Q_{gd} | | | 7.1 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=400V, V_{GS}=13V$ $R_G=3\Omega, I_D=4A$ | | 20 | | ns |
| Turn-On Rise Time | t_r | | | 20 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 22.5 | | |
| Turn-Off Fall Time | t_f | | | 48 | | |

Curve Characteristics



Curve Characteristics

Fig. 7 - Normalized Threshold Voltage

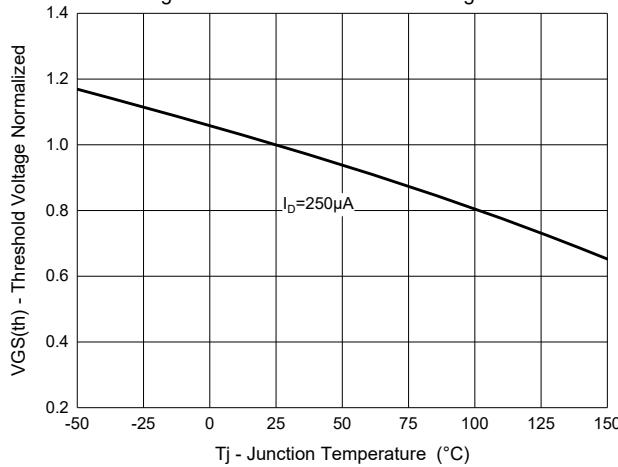


Fig. 8 - Normalized On Resistance Characteristics

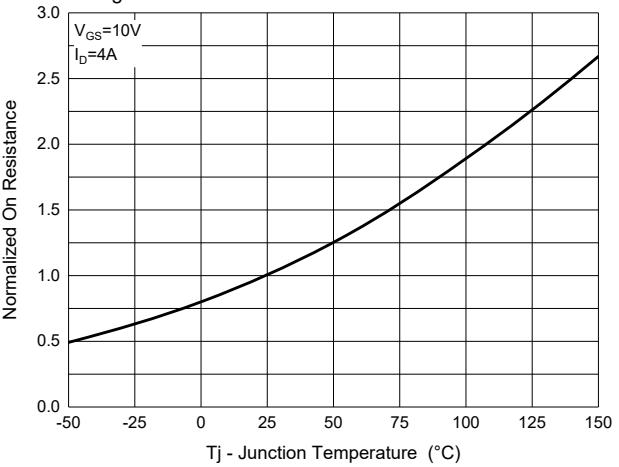


Fig. 9 - I_S - V_{SD}

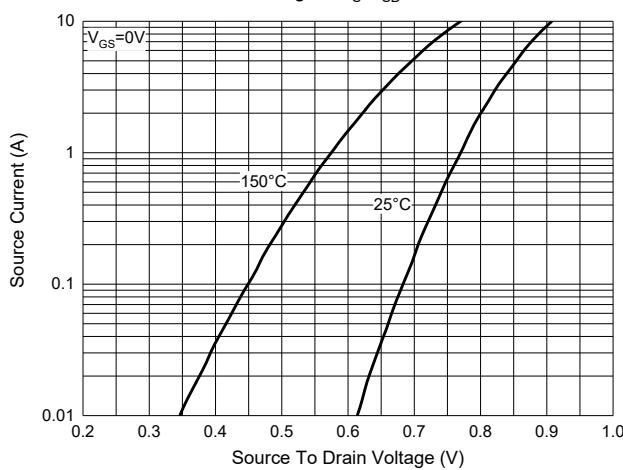


Fig. 10 - Drain Current

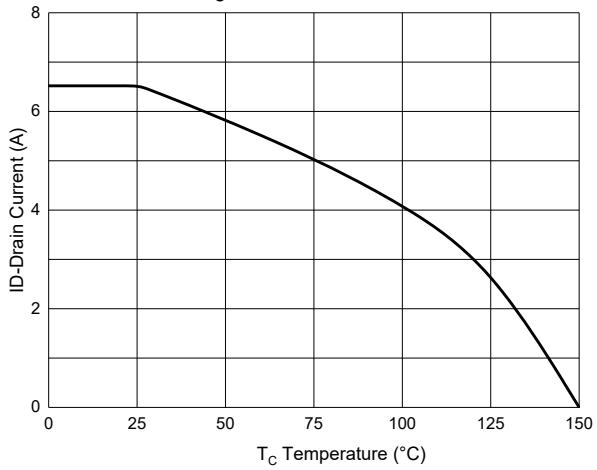
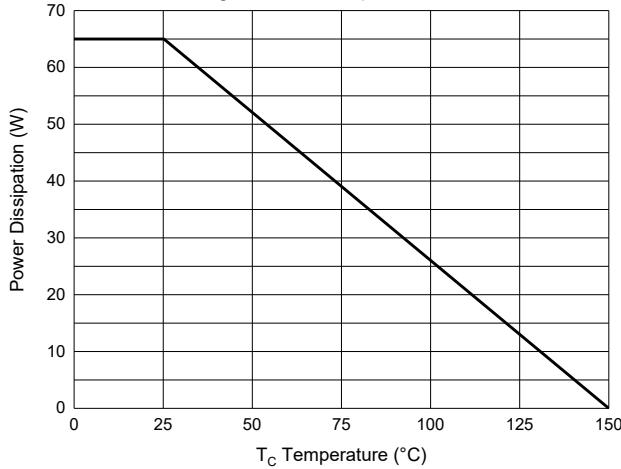
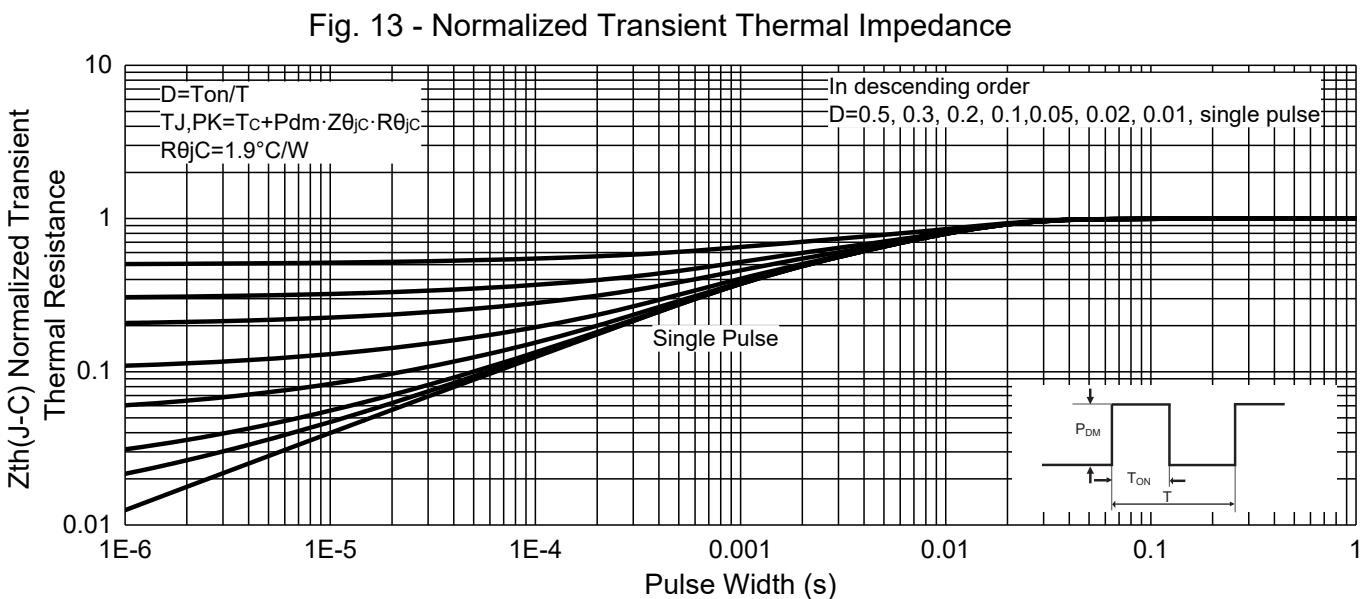
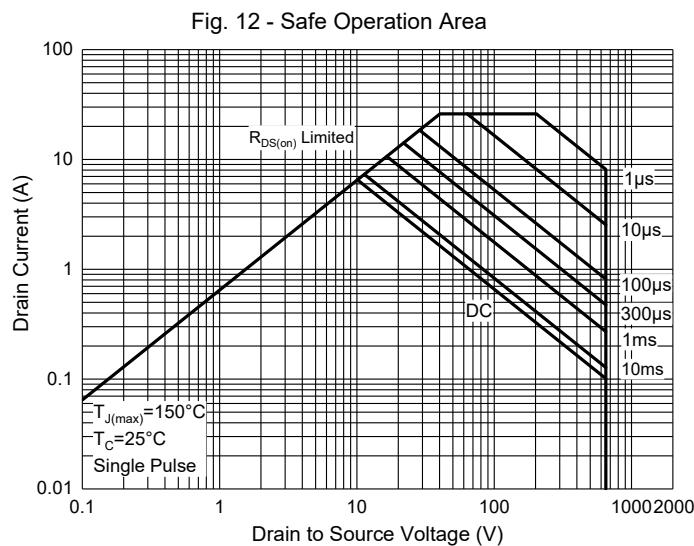


Fig. 11 - PD Dissipation



Curve Characteristics



Ordering Information

| Device | Packing |
|----------------|-------------------------|
| Part Number-TP | Tape&Reel: 2.5Kpcs/Reel |

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