

Features

- AEC-Q101 Qualified
- Split Gate Trench MOSFET Technology
- High Density Cell Design For Ultra Low $R_{DS(on)}$
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device^(Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

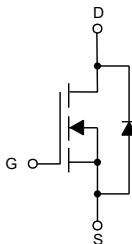
- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 42°C/W Junction to Ambient^(Note2)
- Thermal Resistance: 1.1°C/W Junction to Case

| Parameter | Symbol | Rating | Unit |
|---|----------|-------------------|------|
| Drain-Source Voltage | V_{DS} | 40 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current | I_D | $T_C=25^\circ C$ | 164 |
| | | $T_C=100^\circ C$ | 116 |
| Pulsed Drain Current ^(Note3) | I_{DM} | 656 | A |
| Total Power Dissipation ^(Note4) | P_D | 136 | W |
| Single Pulse Avalanche Energy ^(Note 5) | E_{AS} | 484 | mJ |

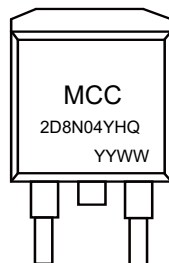
Note:

1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. 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 $T_A=25^\circ C$.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P_D is based on max. junction temperature, using junction-case thermal resistance.
5. $T_J=25^\circ C$, $V_{DD}=40V$, $V_{GS}=10V$, $R_G=25\Omega$, $L=2mH$.

2D8N04YHQ



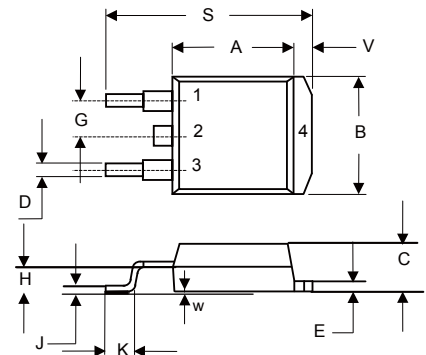
1. Gate
- 2,4. Drain
3. Source



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

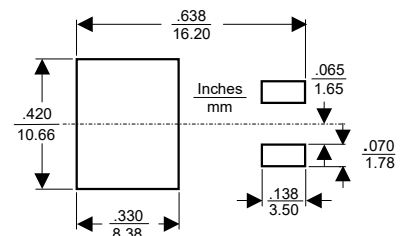
N-Channel MOSFET

D2-PAK



| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|-------|-------|------|
| | MIN | MAX | MIN | MAX | |
| A | 0.331 | 0.370 | 8.40 | 9.40 | |
| B | 0.378 | 0.417 | 9.60 | 10.60 | |
| C | 0.165 | 0.189 | 4.20 | 4.80 | |
| D | 0.027 | 0.037 | 0.68 | 0.94 | |
| E | 0.045 | 0.055 | 1.14 | 1.40 | |
| G | 0.1 | | 2.54 | | TYP. |
| H | 0.096 | 0.134 | 2.43 | 3.40 | |
| J | 0.011 | 0.025 | 0.28 | 0.64 | |
| K | 0.071 | 0.131 | 1.80 | 3.32 | |
| S | 0.575 | 0.625 | 14.60 | 15.87 | |
| V | 0.042 | 0.058 | 1.07 | 1.47 | |
| W | 0.000 | 0.010 | 0.00 | 0.25 | |

Suggested Solder Pad Layout



Electrical Characteristics @ 25°C (Unless Otherwise Specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------|---------------|---|-----|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 40 | | | V |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 20V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=40V, V_{GS}=0V$ | | | 1 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2 | 3 | 4 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=20A$ | | 2.2 | 2.8 | m Ω |
| Gate Resistance | R_g | f=1 MHz, Open drain | | 1 | | Ω |
| Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | | | | 164 | A |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=20A$ | | 0.9 | 1.2 | V |
| Reverse Recovery Time | t_{rr} | $I_F=30A, dI_F/dt=150A/\mu s$ | | 38 | | ns |
| Reverse Recovery Charge | Q_{rr} | | | 40 | | nC |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=25V, V_{GS}=0V, f=1MHz$ | | 3540 | | pF |
| Output Capacitance | C_{oss} | | | 1000 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 40 | | |
| Total Gate Charge | Q_g | $V_{DS}=20V, V_{GS}=10V, I_D=45A$ | | 42 | | nC |
| Gate-Source Charge | Q_{gs} | | | 15 | | |
| Gate-Drain Charge | Q_{gd} | | | 9.4 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=20V, V_{GS}=10V, R_{GEN}=2.2\Omega, I_{DS}=45A$ | | 20 | | ns |
| Turn-On Rise Time | t_r | | | 209 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 25 | | |
| Turn-Off Fall Time | t_f | | | 12 | | |

Curve Characteristics

Fig.1 - Typical Output Characteristics

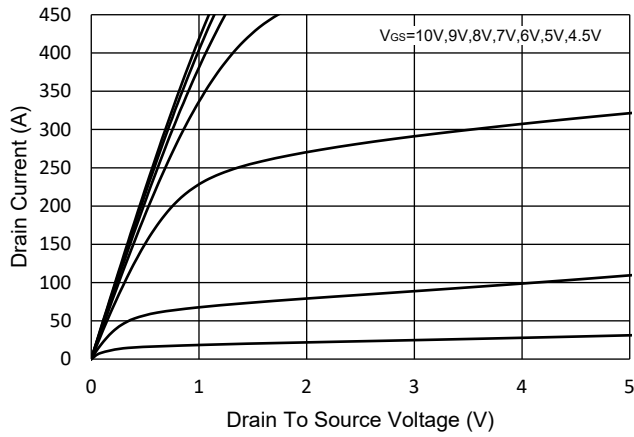


Fig.2 - Transfer Characteristic

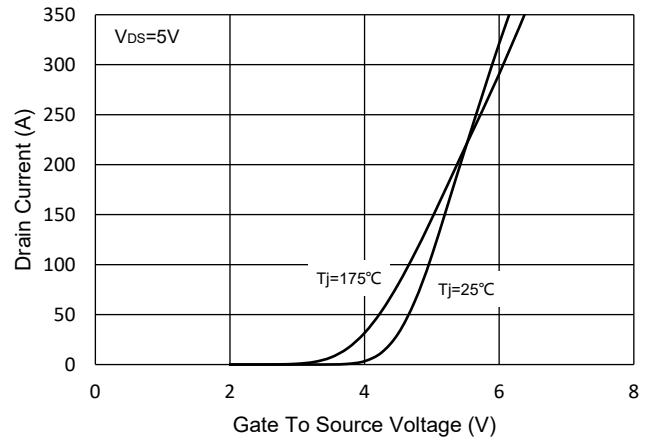


Fig.3 - $R_{DS(ON)}$ - V_{GS}

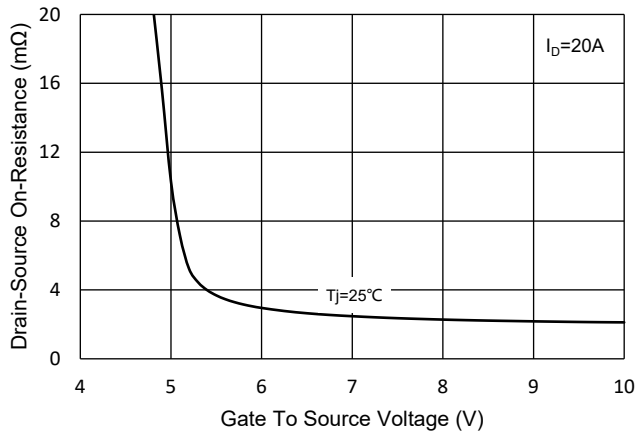


Fig. 4 - $R_{DS(ON)}$ - I_D

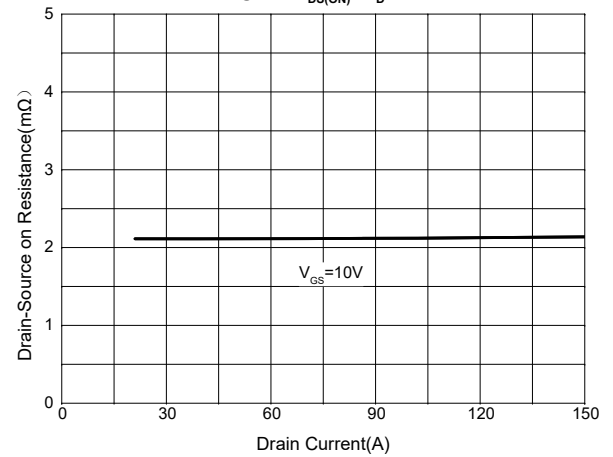


Fig.5 - Capacitance Characteristics

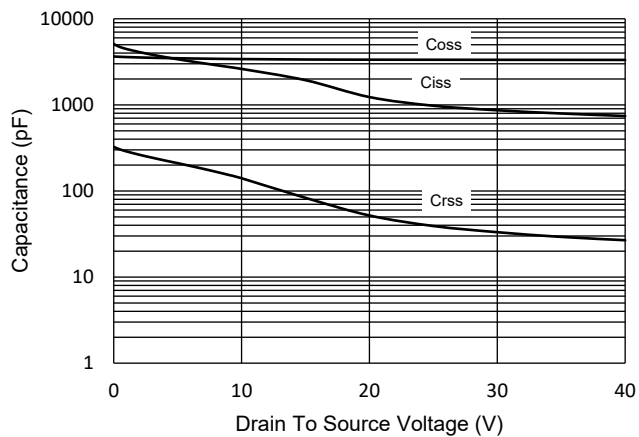
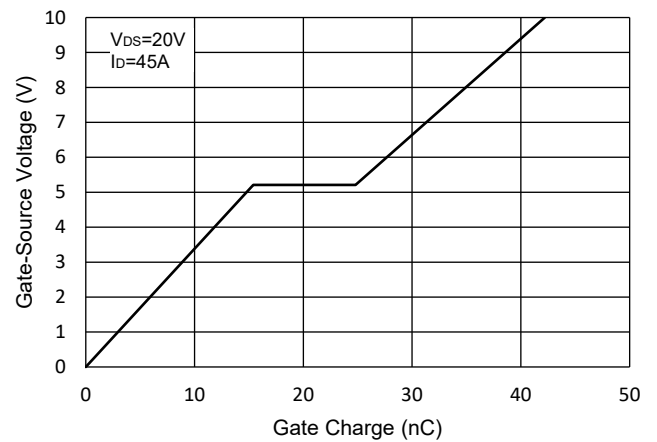


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

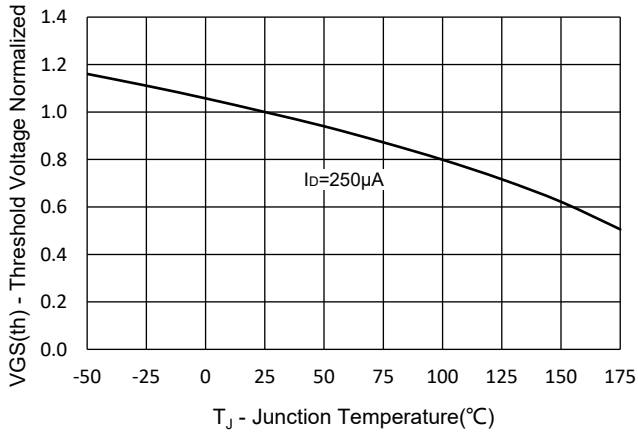


Fig.8 - Normalized On Resistance Characteristics

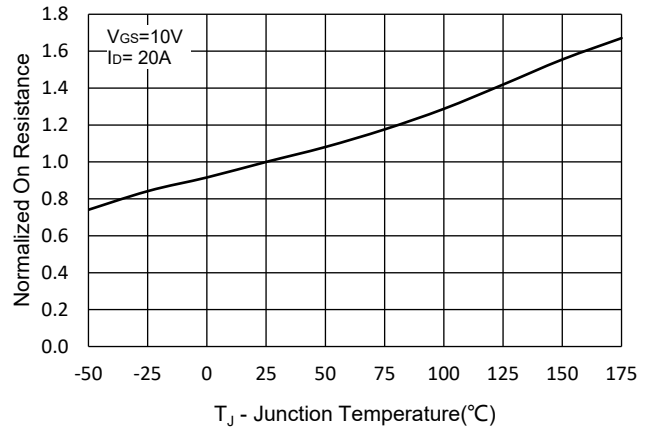


Fig.9 - I_S - V_{SD}

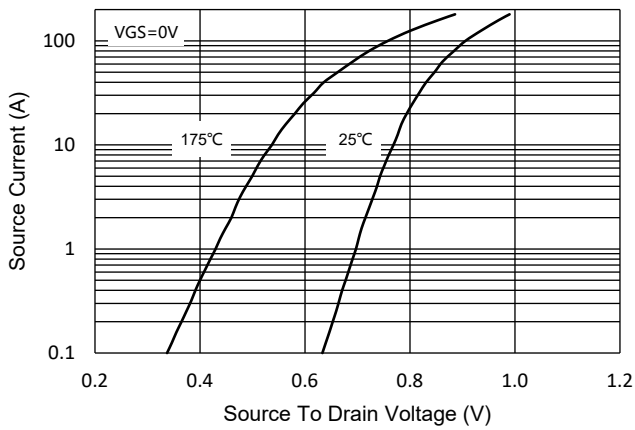


Fig. 10 - Drain Current

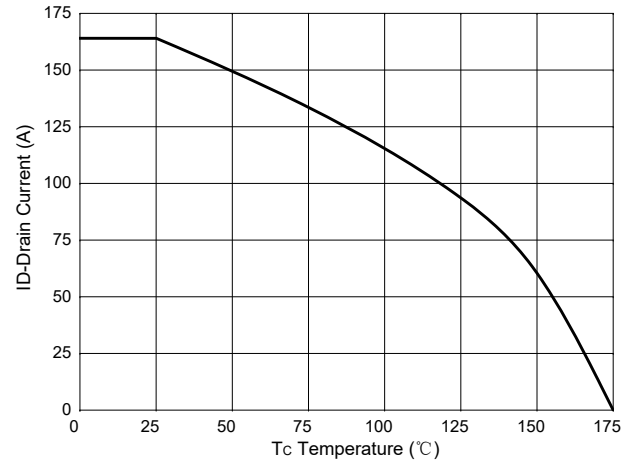
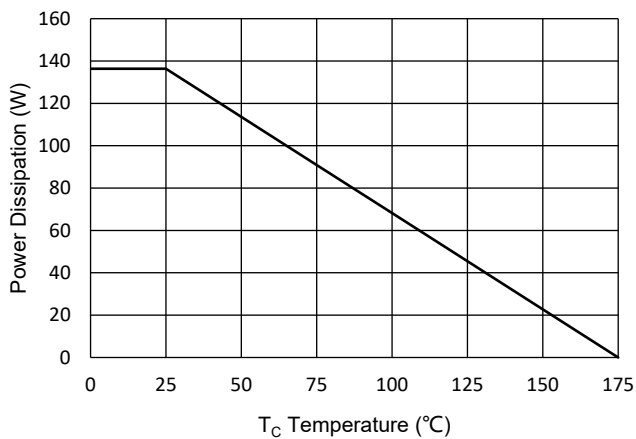


Fig.11 - PD Dissipation



Curve Characteristics

Fig.12 - Safe Operation Area

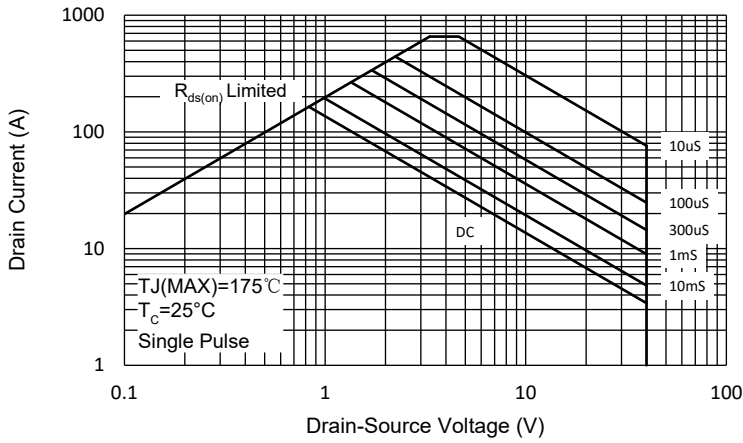
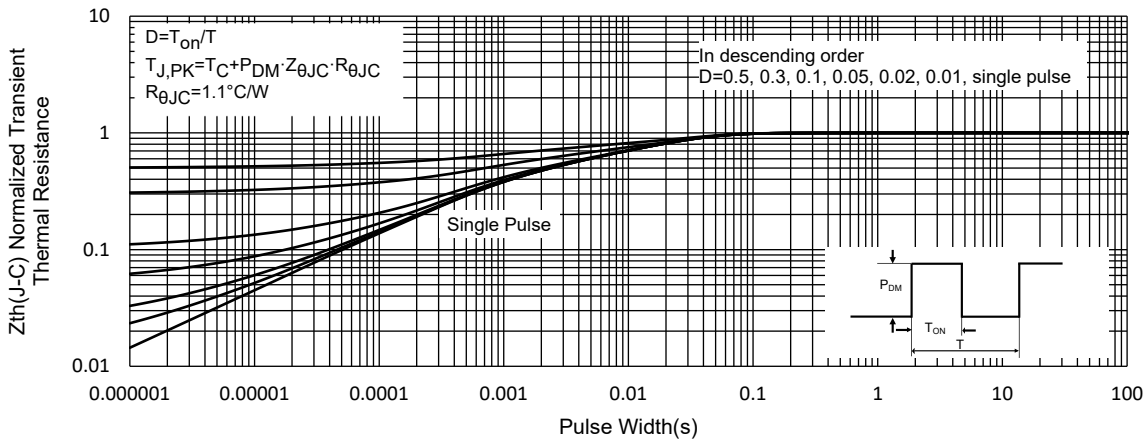


Fig.13 - Normalized Transient Thermal Impedance



Ordering Information

| Device | Packing |
|----------------|------------------------|
| Part Number-TP | Tape&Reel: 800pcs/Reel |

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