

Description

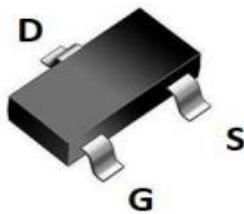
N-channel Enhancement Mode Power MOSFET

Features

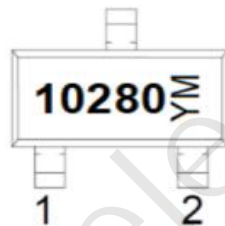
- 100V, 3.8A
 $R_{DS(ON)} < 286m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 325m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

Applications

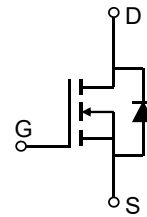
- Load Switch
- PWM Application
- Power Management



SOT-23-3L



Marking and Pin Assignment



Schematic Diagram

Package Marking and Ordering Information

| Device Marking | Device | Outline | Package | Reel Size | Reel(pcs) | Per Carton (pcs) |
|----------------|--------------|---------|-----------|-----------|-----------|------------------|
| 10280 | CRMJTL10280A | TAPING | SOT-23-3L | 7" | 3000 | 120000 |

Absolute Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Value | Units |
|-----------------|---|---------------------------|--------------------|
| V_{DS} | Drain-to-Source Voltage | 100 | V |
| V_{GS} | Gate-to-Source Voltage | ± 20 | V |
| I_D | Continuous Drain Current | $T_C = 25^\circ\text{C}$ | A |
| | | $T_C = 100^\circ\text{C}$ | |
| I_{DM} | Pulsed Drain Current ⁽¹⁾ | 15 | A |
| P_D | Power Dissipation | $T_C = 25^\circ\text{C}$ | W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 54 | $^\circ\text{C/W}$ |
| T_J, T_{STG} | Junction & Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ |



Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|--|--|--|------|------|------|------|
| Off Characteristics | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | I _D = 250μA, V _{GS} = 0V | 100 | - | - | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} = 100V, V _{GS} = 0V | - | - | 1.0 | μA |
| I _{GSS} | Gate-Body Leakage Current | V _{DS} = 0V, V _{GS} = ±20V | - | - | ±100 | nA |
| On Characteristics | | | | | | |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} = V _{GS} , I _D = 250μA | 1.0 | 1.5 | 2.2 | V |
| R _{DS(ON)} | Static Drain-Source ON-Resistance ⁽²⁾ | V _{GS} = 10V, I _D = 2A | - | 220 | 286 | mΩ |
| | | V _{GS} = 4.5V, I _D = 1A | - | 250 | 325 | mΩ |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{GS} = 0V, V _{DS} = 25V, f = 1MHz | - | 321 | - | pF |
| C _{oss} | Output Capacitance | | - | 21 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | | - | 15 | - | pF |
| Q _g | Total Gate Charge | V _{GS} = 0 to 10V V _{DS} = 30V, I _D =2A | - | 5.3 | - | nC |
| Q _{gs} | Gate Source Charge | | - | 1.3 | - | nC |
| Q _{gd} | Gate Drain("Miller") Charge | | - | 1.7 | - | nC |
| Switching Characteristics | | | | | | |
| t _{d(on)} | Turn-On DelayTime | V _{GS} = 10V, V _{DD} = 30V I _D = 1A, R _{GEN} = 3Ω | - | 14 | - | ns |
| t _r | Turn-On Rise Time | | - | 54 | - | ns |
| t _{d(off)} | Turn-Off DelayTime | | - | 18 | - | ns |
| t _f | Turn-Off Fall Time | | - | 11 | - | ns |
| Drain-Source Diode Characteristics and Max Ratings | | | | | | |
| I _S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 3.8 | A |
| I _{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 15.2 | A |
| V _{SD} | Drain to Source Diode Forward Voltage | V _{GS} = 0V, I _S = 3A | - | - | 1.2 | V |

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.

Typical Performance Characteristics

Figure 1: Output Characteristics

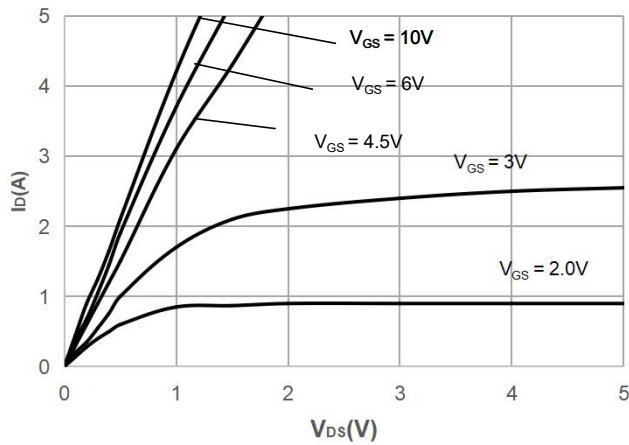


Figure 2: Typical Transfer Characteristics

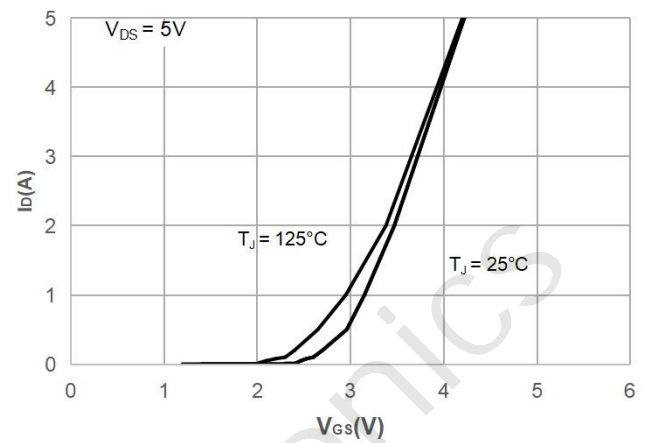


Figure 3: On-resistance vs. Drain Current

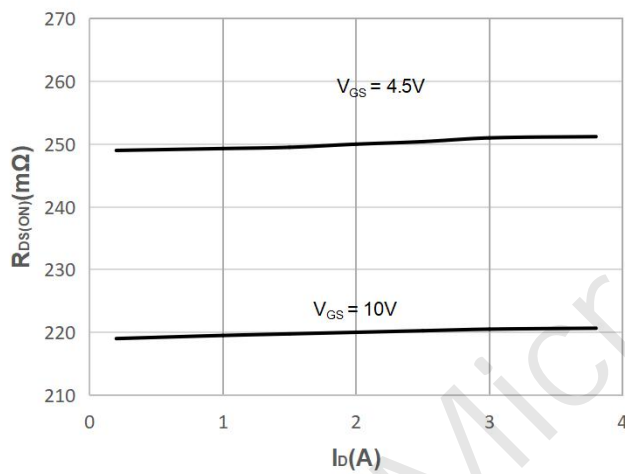


Figure 4: Body Diode Characteristics

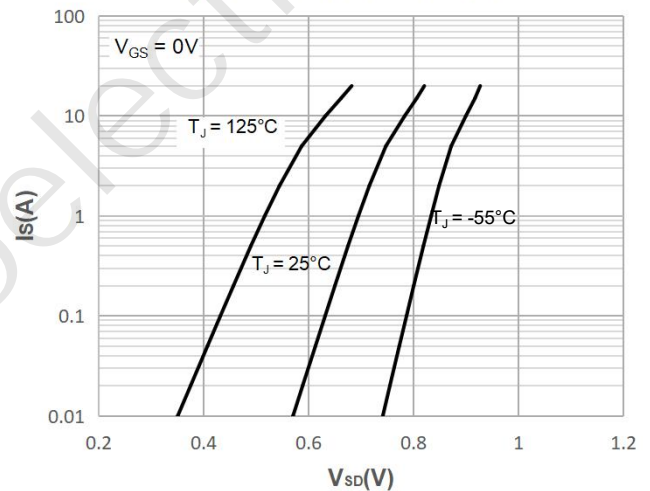


Figure 5: Gate Charge Characteristics

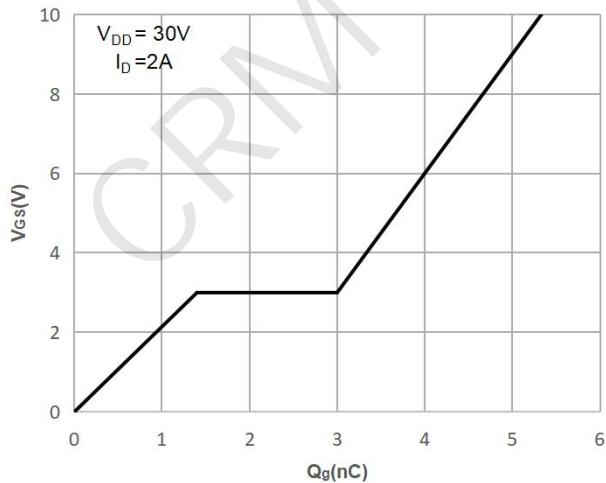
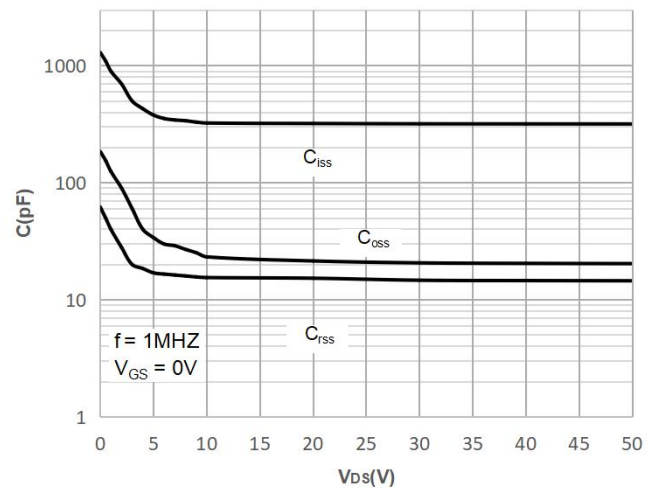


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

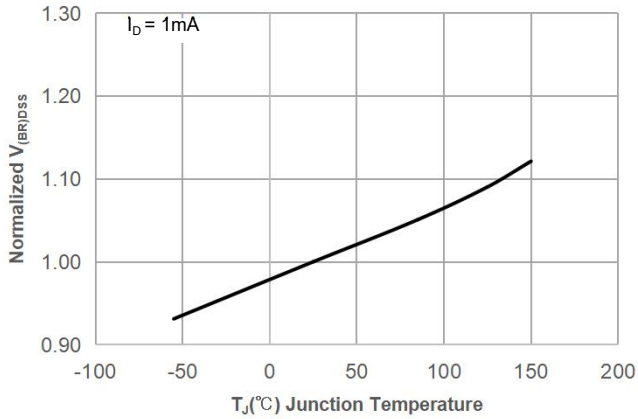


Figure 8: Normalized on Resistance vs. Junction Temperature

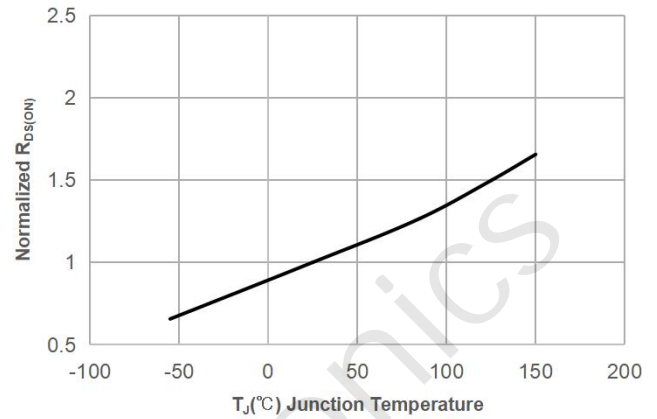


Figure 9: Maximum Safe Operating Area

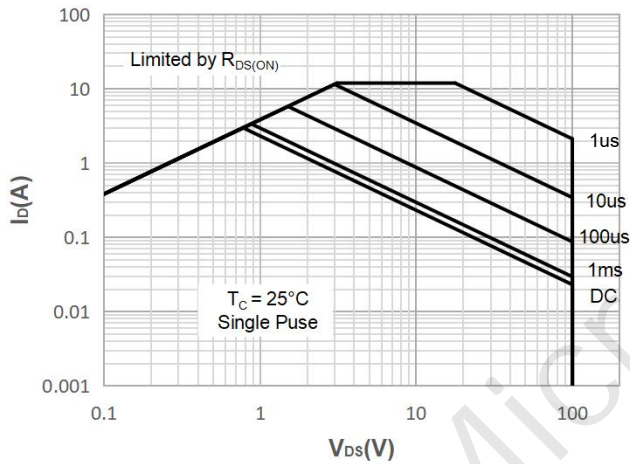


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

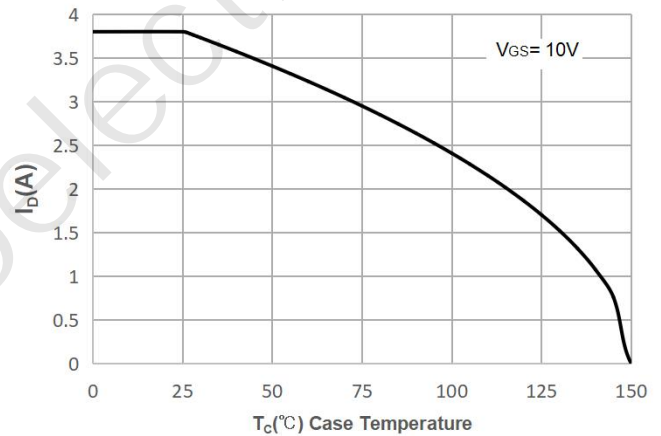


Figure 11: Normalized Maximum Transient Thermal Impedance

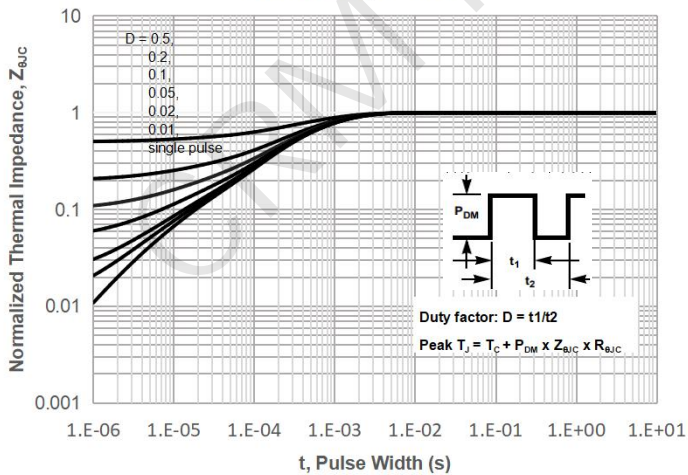
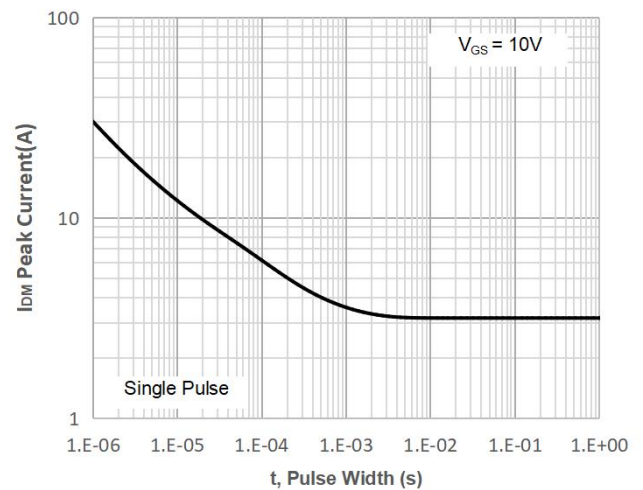


Figure 12: Peak Current Capacity



Test Circuit

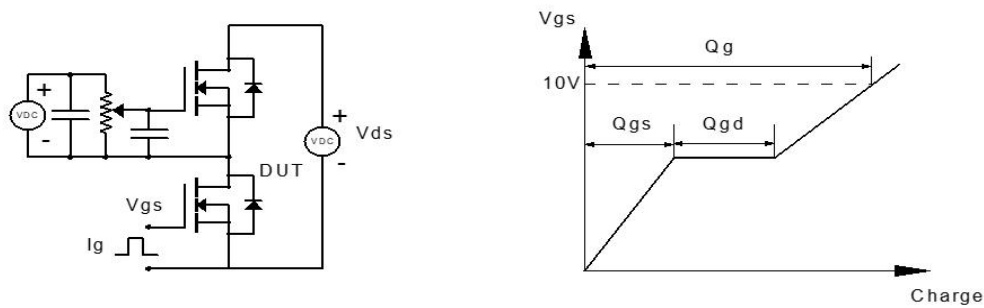


Figure 1: Gate Charge Test Circuit & Waveform

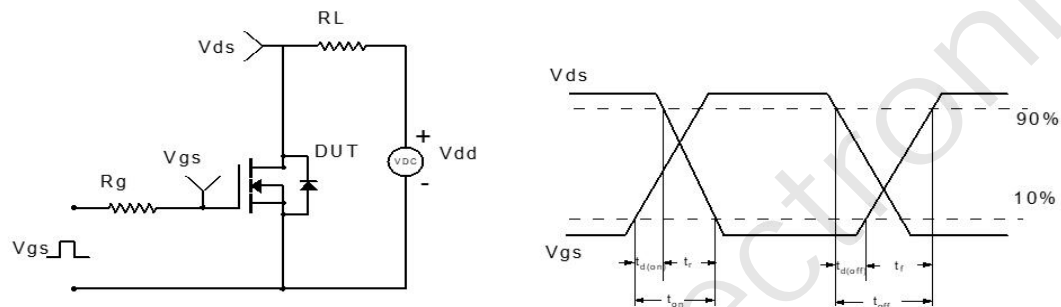


Figure 2: Resistive Switching Test Circuit & Waveform

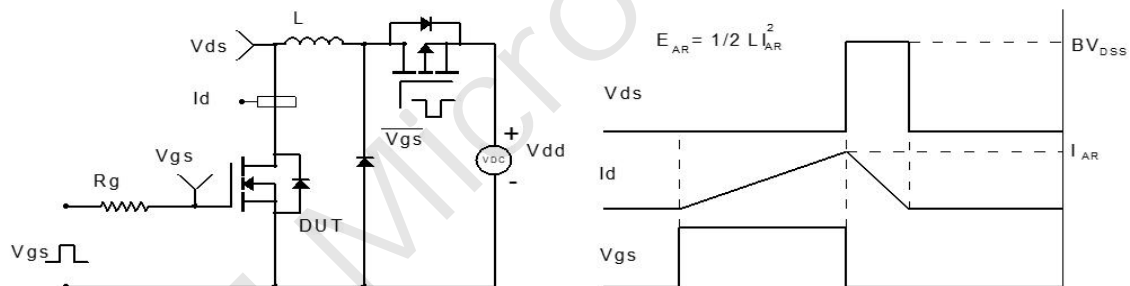


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

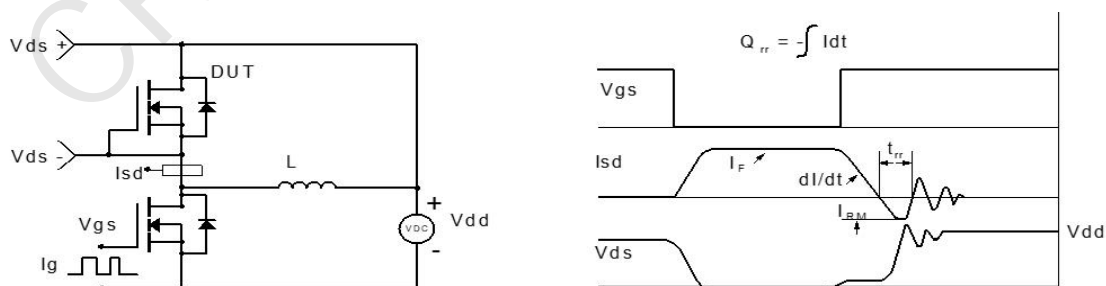
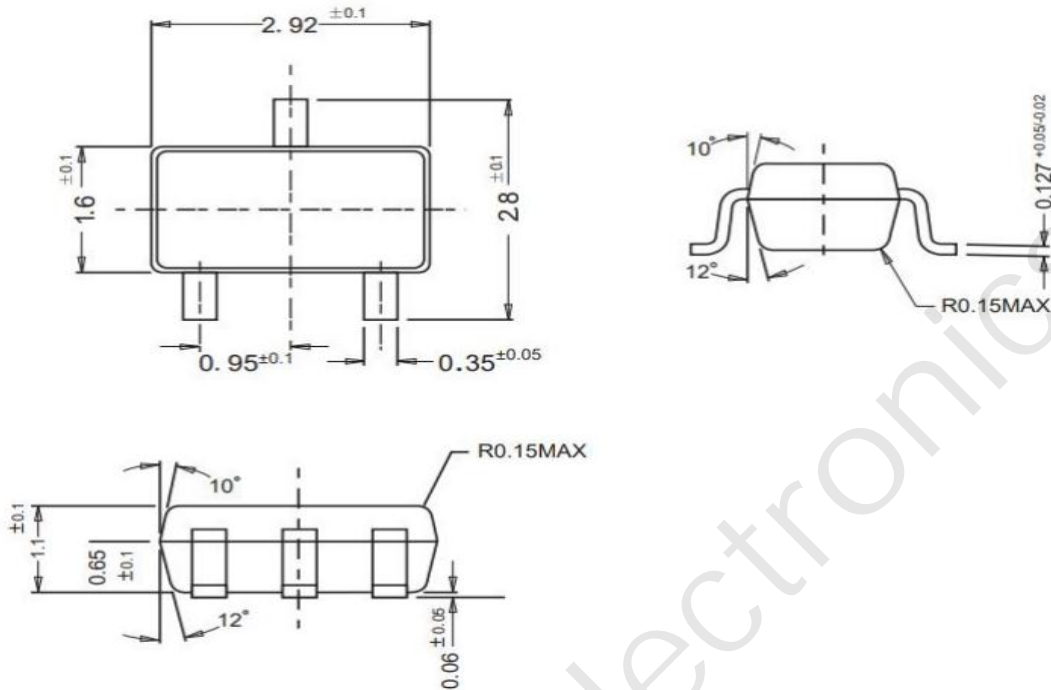


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(SOT-23-3L)



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