

Descriptions

This 40V 70A N-Channel MOSFET in a TO-252 Plastic Package.

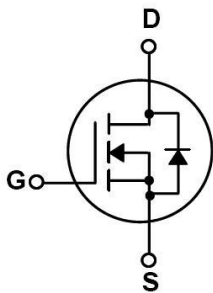
Features

- $V_{DS}(V)=40V$ $I_D=70A$
- $R_{DS(ON)}@10V < 6m\Omega$ (Typ. 5.6mR)
- $R_{DS(ON)}@4.5V < 12m\Omega$ (Typ. 10.8mR)
- Halogen-free Product.

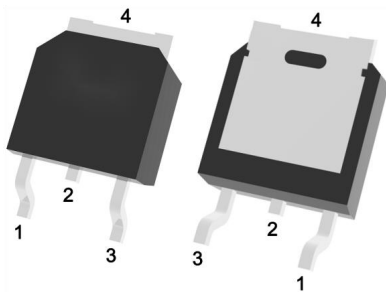
Applications

- Suited for low voltage applications such as automotive
- DC/DC Converters
- High efficiency switching for power management in portable and battery operated products
- Meet the stringent requirements of automotive applications.

Equivalent Circuit



Pinning



PIN1: G PIN 2: D PIN 3: S PIN 4 : D

Marking

See Marking Instructions.

Absolute Maximum Ratings(Ta=25°C)

| Parameter | Symbol | Rating | Unit |
|---|-----------------------------------|------------|------|
| Drain-Source Voltage | V _{DSS} | 40 | V |
| Drain Current | I _D (Tc=25°C) | 70 | A |
| Drain Current - Pulsed | I _{DM} | 159 | A |
| Gate-Source Voltage | V _{GS} | ±20 | V |
| Avalanche Current | I _{AS} | 24.5 | A |
| Single Pulsed Avalanche Energy(L=0.5mH) | E _{AS} | 192 | mJ |
| Power Dissipation | P _D (Tc=25°C) | 50 | W |
| Junction and Storage Temperature Range | T _J , T _{STG} | -55 to 150 | °C |
| Thermal Resistance-Junction to Ambient | t ≤ 10s | 20 | °C/W |
| | Steady-State | 50 | |
| Thermal Resistance-Junction to Case | Steady-State | 2.5 | |

Electrical Characteristics(Ta=25°C)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|------------------------------------|----------------------|--|-----|------|------|------|
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V I _D =250μA | 40 | 46 | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =40V V _{GS} =0V | | | 1.0 | μA |
| Gate-Body Leakage Current Forward | I _{GSS} | V _{GS} =±20V V _{DS} =0V | | | ±100 | nA |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} I _D =250μA | 1.0 | 1.6 | 3.0 | V |
| Static Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =10V I _D =20A | | 5.6 | 6 | mΩ |
| | | V _{GS} =4.5V I _D =10A | | 8.6 | 12 | |
| Drain-Source Diode Forward Voltage | V _{SD} | V _{GS} =0V I _S =1A | | | 1.4 | V |
| Gate resistance | R _g | V _{GS} =0V V _{DS} =0V, f=1MHz | | 2.1 | | Ω |
| Input Capacitance | C _{iss} | V _{DS} =25V V _{GS} =0V f=1.0MHz | | 2200 | | pF |
| Output Capacitance | C _{oss} | | | 265 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 145 | | |
| Total Gate Charge | Q _{g(10V)} | V _{GS} =10V, I _D =20A, V _{DS} =20V, | | 22 | | nC |
| Total Gate Charge | Q _{g(4.5V)} | | | 8.9 | | |
| Gate Source Charge | Q _{gs} | | | 5.7 | | |
| Gate Drain Charge | Q _{gd} | | | 3.1 | | |

Electrical Characteristics(Ta=25°C)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------|--------------|--|-----|-----|-----|------|
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}=10V$ $V_{DS}=20V$ $R_L=1.0\ \Omega$ $R_{GEN}=3\ \Omega$ | | 7.8 | | ns |
| Turn-On Rise Time | t_r | | | 2.1 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 25 | | |
| Turn-Off Fall Time | t_f | | | 3.2 | | |

Electrical Characteristic Curve

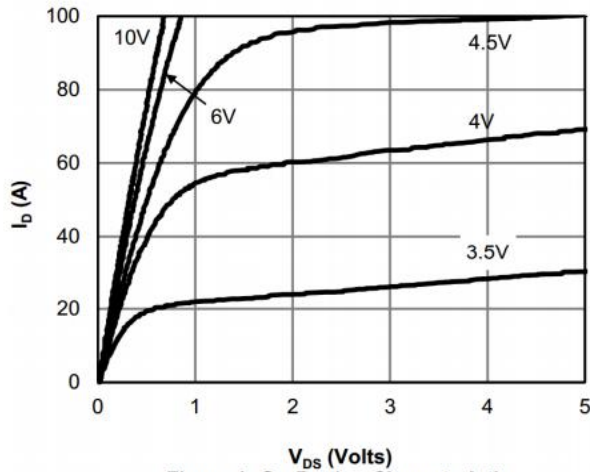


Figure 1: On-Region Characteristics

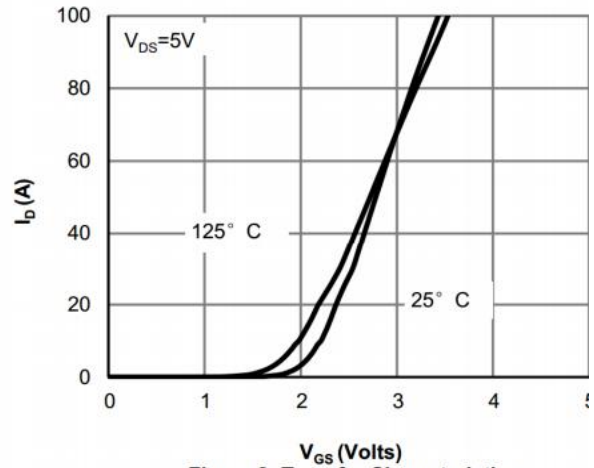


Figure 2: Transfer Characteristics

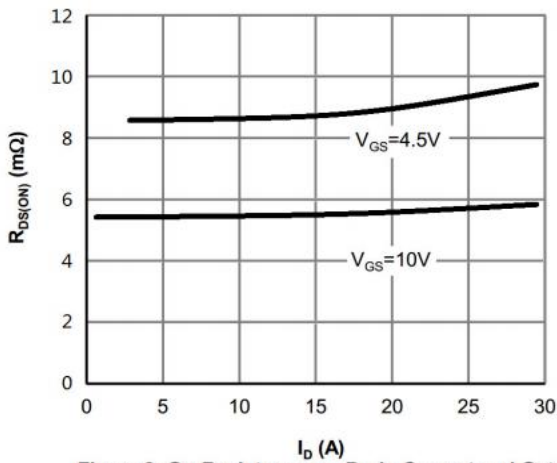


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

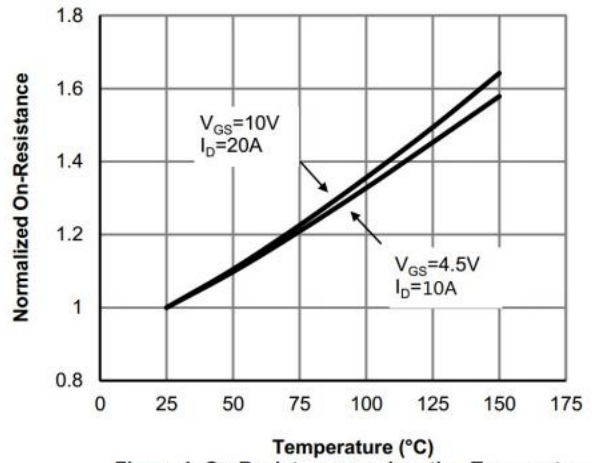


Figure 4: On-Resistance vs. Junction Temperature

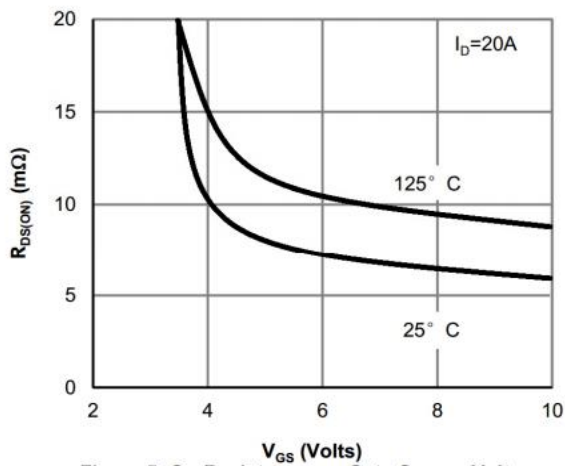


Figure 5: On-Resistance vs. Gate-Source Voltage

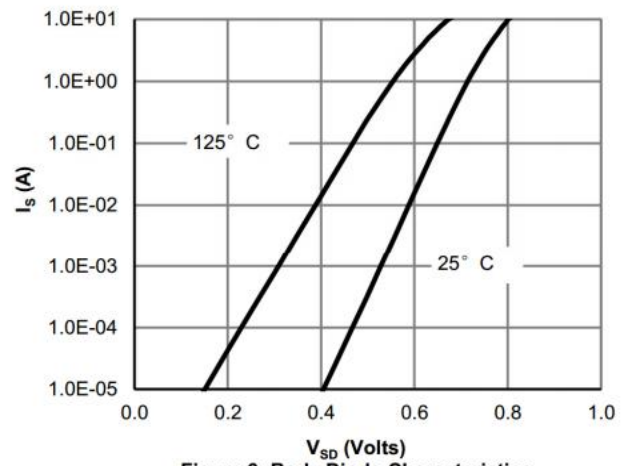


Figure 6: Body-Diode Characteristics

Electrical Characteristic Curve

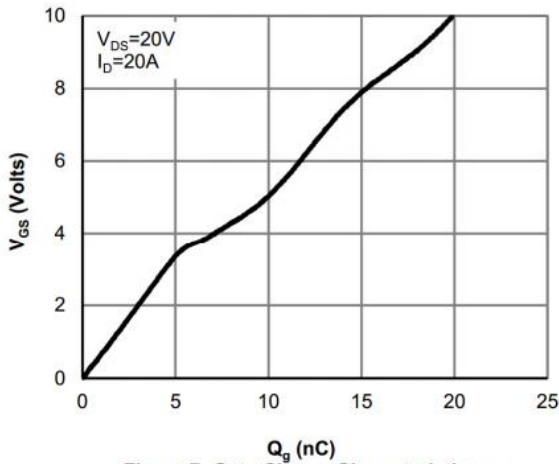


Figure 7: Gate-Charge Characteristics

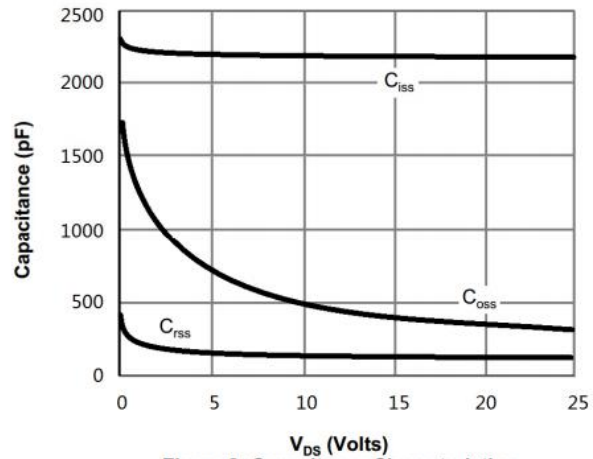


Figure 8: Capacitance Characteristics

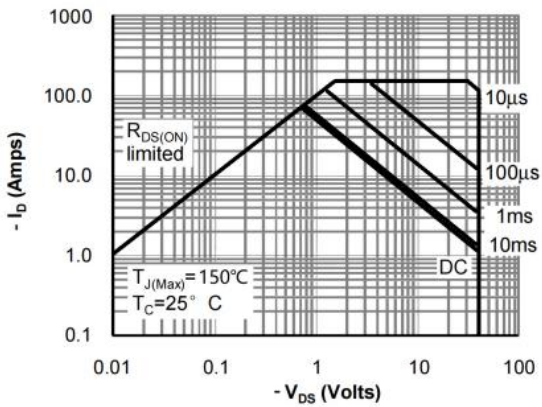


Figure 9: Maximum Forward Biased Safe Operating Area

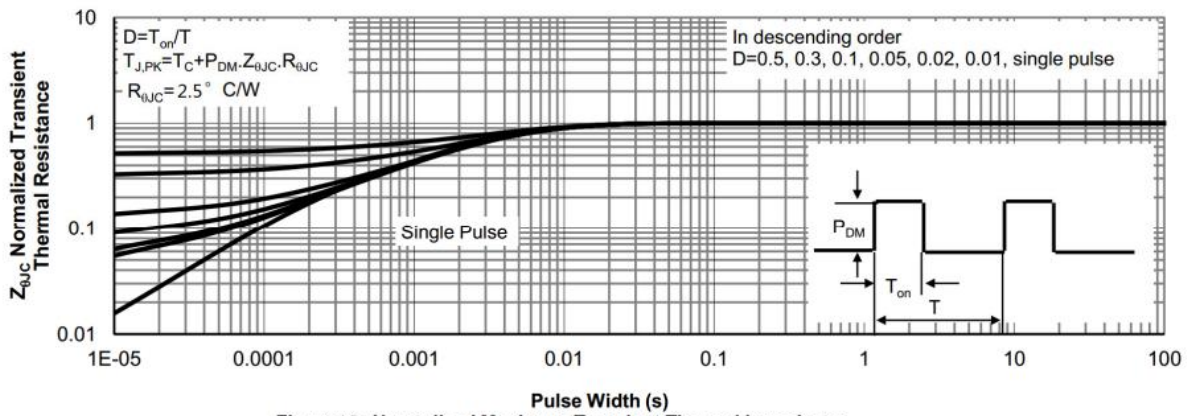
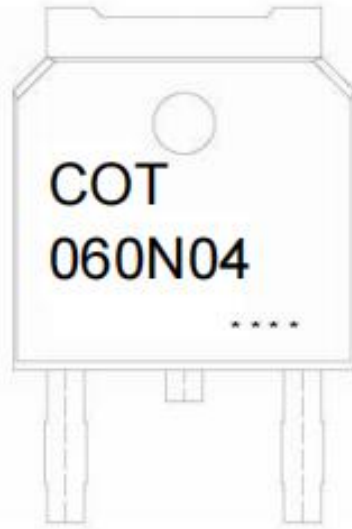


Figure 10: Normalized Maximum Transient Thermal Impedance

Marking Instructions



Note:

COT: Company Logo

060N04: Product Type.

****: Lot No. Code, code change with Lot No.

Packaging SPEC

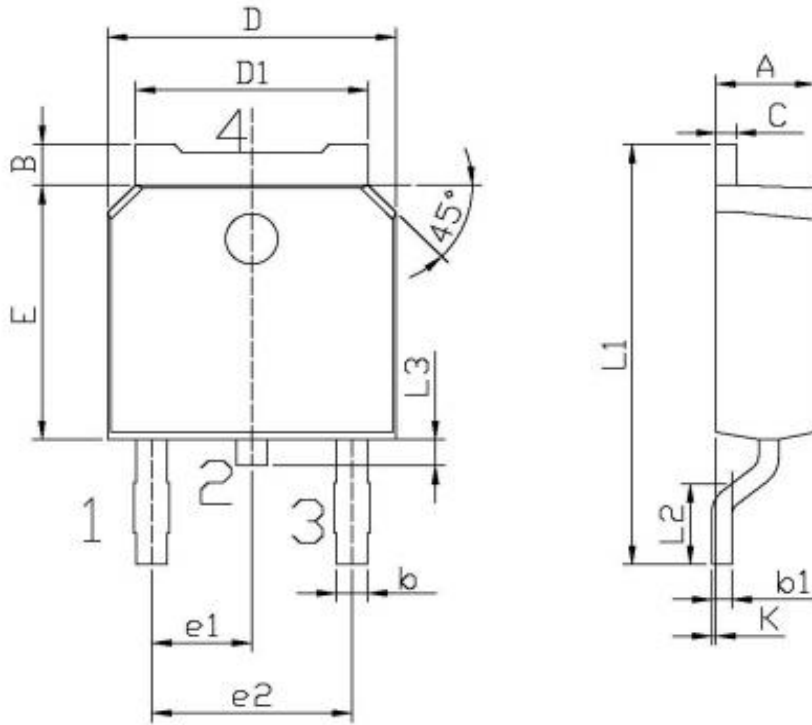
REEL INFORMATION

| Package Type | Units | | | | | Dimension (unit: mm ³) | | |
|--------------|------------|-----------------|-----------------|-----------------------|-----------------|------------------------------------|------------|-------------|
| | Units/Reel | Reels/Inner Box | Units/Inner Box | Inner Boxes/Outer Box | Units/Outer Box | Reel | Inner Box | Outer Box |
| TO-252 | 2,500 | 2 | 5,000 | 6 | 30,000 | 13" ×16 | 360×360×50 | 380×335×366 |

TUBE INFORMATION

| Package Type | Units | | | | | Dimension (unit: mm ³) | | |
|--------------|------------|-----------------|-----------------|-----------------------|-----------------|------------------------------------|------------|-------------|
| | Units/Tube | Tubes/Inner Box | Units/Inner Box | Inner Boxes/Outer Box | Units/Outer Box | Tube | Inner Box | Outer Box |
| TO-251/252 | 75 | 48 | 3,600 | 5 | 18,000 | 526×20.5×5.25 | 555×164×50 | 575×290×180 |

Package Outline Dimensions



单位: mm

| Symbol | Dimensions In Millimeters | | Symbol | Dimensions In Millimeters | |
|--------|---------------------------|------|--------|---------------------------|-------|
| | Min | Max | | Min | Max |
| A | 2.20 | 2.40 | E | 5.95 | 6.25 |
| B | 0.95 | 1.25 | e1 | 2.24 | 2.34 |
| b | 0.70 | 0.90 | e2 | 4.43 | 4.73 |
| b1 | 0.45 | 0.55 | L1 | 9.85 | 10.35 |
| C | 0.45 | 0.55 | L2 | 1.70 | 2.00 |
| D | 6.45 | 6.75 | L3 | 0.60 | 0.90 |
| D1 | 5.10 | 5.50 | K | 0.00 | 0.10 |

TO-252