

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | I_D |
|---------------|-----------------|-------|
| 100V | 90mΩ@10V | 3.5A |
| | 100mΩ@4.5V | |
| -100V | 230mΩ@-10V | -2.5A |
| | 240mΩ@-4.5V | |

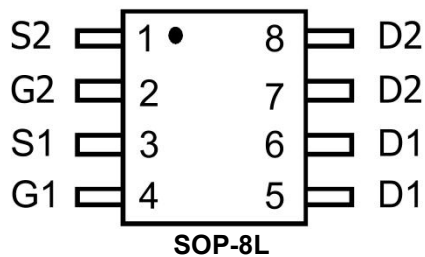
Feature

- TrenchFET Power MOSFET
- Excellent $R_{DS(on)}$ and Low Gate Charge
- Fast Switching Speed

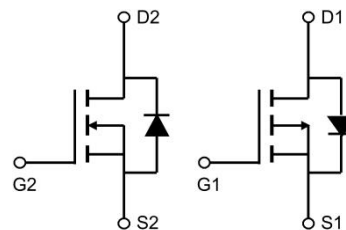
Application

- Motor Control
- DC-DC Converters
- Power Management

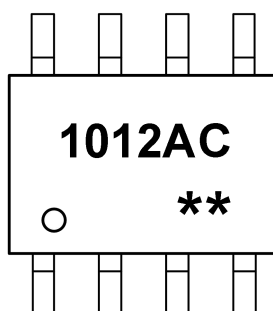
Package



Circuit diagram



Marking



1012AC = Device code
** = Week Code

Absolute maximum ratings (Ta=25°C unless otherwise noted)

| Parameter | Symbol | Value | | Unit |
|---|-----------------|-----------|-----------|---------------|
| | | N-Channel | P-Channel | |
| Drain-Source Voltage | V_{DS} | 100 | -100 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | ± 20 | V |
| Continuous Drain Current | I_D | 3.5 | -2.5 | A |
| Power Dissipation | P_D | 1.8 | 1.8 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 69.5 | | $^{\circ}C/W$ |
| Junction Temperature | T_J | 150 | | $^{\circ}C$ |
| Storage Temperature | T_{STG} | -55~ +150 | | $^{\circ}C$ |

N-Channel Electrical characteristics (T_A=25 °C, unless otherwise noted)

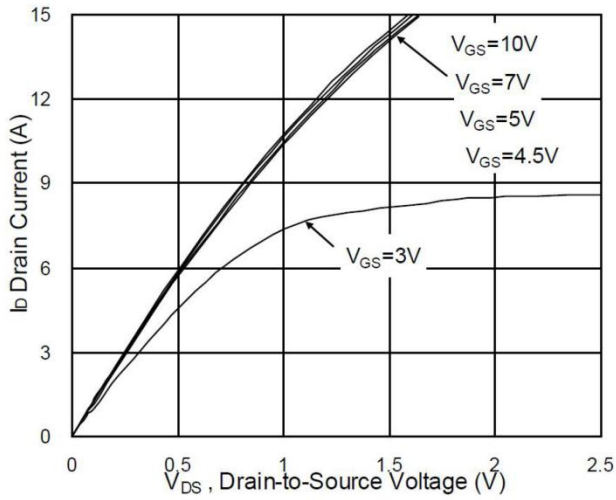
| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|----------------------------------|---------------|---|------|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 100 | - | - | V |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = 80V, V_{GS} = 0V$ | - | - | 1 | μA |
| Gate-body leakage current | I_{GSS} | $V_{GS} = \pm 20V, V_{DS} = 0V$ | - | - | ± 0.1 | μA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1.0 | 1.8 | 2.5 | V |
| Drain-source on-resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 2A$ | - | 90 | 110 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 1A$ | - | 100 | 120 | |
| Dynamic characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=15V, V_{GS}=0V, f=1MHz$ | - | 1100 | - | pF |
| Output Capacitance | C_{oss} | | - | 55 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 40 | - | |
| Switching Characteristics | | | | | | |
| Total gate charge | Q_g | $V_{DS}=80V, V_{GS}=10V, I_D=2A$ | - | 12 | - | nC |
| Gate-source charge | Q_{gs} | | - | 2.9 | - | |
| Gate-drain charge | Q_{gd} | | - | 1.8 | - | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD}=50V, V_{GS}=10V, R_G=3\Omega, I_D=2A$ | - | 3.9 | - | ns |
| Turn-on rise time | t_r | | - | 26 | - | |
| Turn-off delay time | $t_{d(off)}$ | | - | 16.2 | - | |
| Turn-off fall time | t_f | | - | 8.9 | - | |
| Diode Characteristics | | | | | | |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=1A, T_J=25^{\circ}C$ | - | - | 1.2 | V |

P-Channel Electrical characteristics (T_A=25 °C, unless otherwise noted)

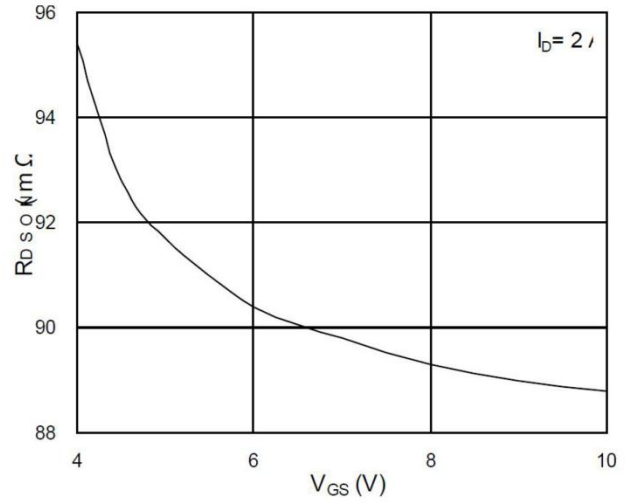
| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|----------------------|---|------|------|------|------|
| Static Characteristics | | | | | | |
| Drain-source breakdown voltage | V _{(BR)DSS} | V _{GS} = 0V, I _D = -250μA | -100 | - | - | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} = -80V, V _{GS} = 0V | - | - | -1 | μA |
| Gate-body leakage current | I _{GSS} | V _{GS} = ±20V, V _{DS} = 0V | - | - | ±100 | nA |
| Gate threshold voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = -250μA | -1 | -1.8 | -2.5 | V |
| Drain-source on-resistance | R _{DS(on)} | V _{GS} = -10V, I _D = -2A | - | 230 | 290 | mΩ |
| | | V _{GS} = -4.5V, I _D = -1A | - | 240 | 320 | |
| Dynamic characteristics | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} = -15V, V _{GS} = 0V, f = 1MHz | - | 1239 | - | pF |
| Output Capacitance | C _{oss} | | - | 42 | - | |
| Reverse Transfer Capacitance | C _{rss} | | - | 29 | - | |
| Switching Characteristics | | | | | | |
| Turn-on delay time | t _{d(on)} | V _{DD} = -50V, I _D = -2A, V _{GS} = -10V, R _{GEN} = 10Ω | - | 9.1 | - | ns |
| Turn-on rise time | t _r | | - | 14.8 | - | |
| Turn-off delay time | t _{d(off)} | | - | 57 | - | |
| Turn-off fall time | t _f | | - | 14 | - | |
| Total gate charge | Q _g | V _{DS} = -60V, V _{GS} = -10V, I _D = -2A | - | 25 | - | nC |
| Gate-source charge | Q _{gs} | | - | 5 | - | |
| Gate-drain charge | Q _{gd} | | - | 7 | - | |
| Source-Drain Diode Characteristics | | | | | | |
| Body Diode Voltage | V _{SD} | I _S = -1A, V _{GS} = 0V | - | - | -1.2 | V |



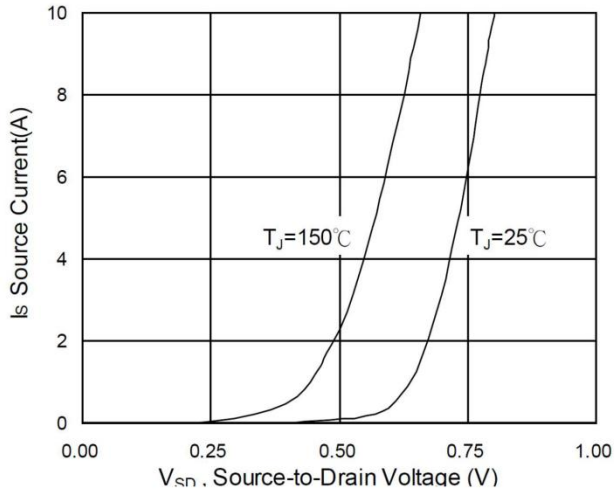
N-Channel Typical Characteristics



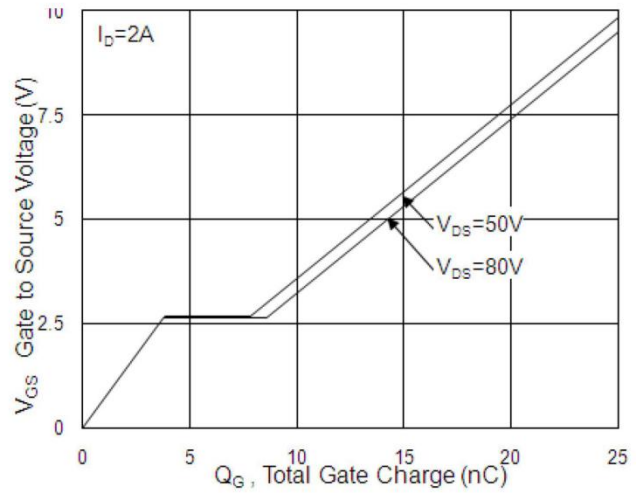
Typical Output Characteristics



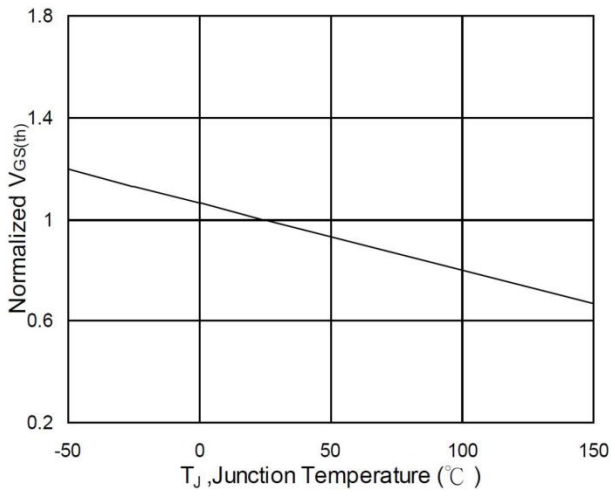
On-Resistance vs. Gate-Source



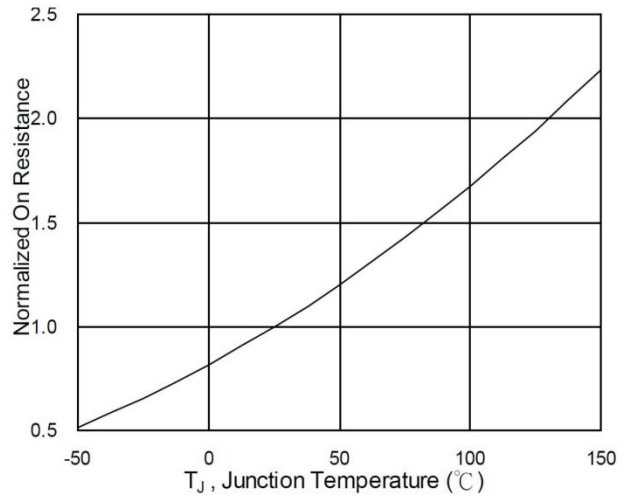
Forward Characteristics Of Reverse



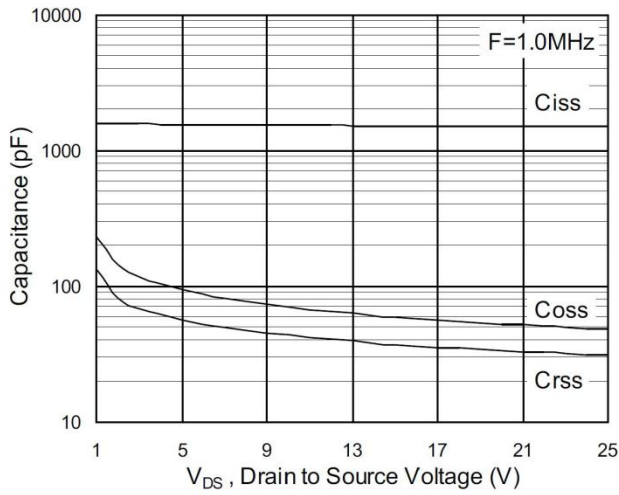
Gate-Charge Characteristics



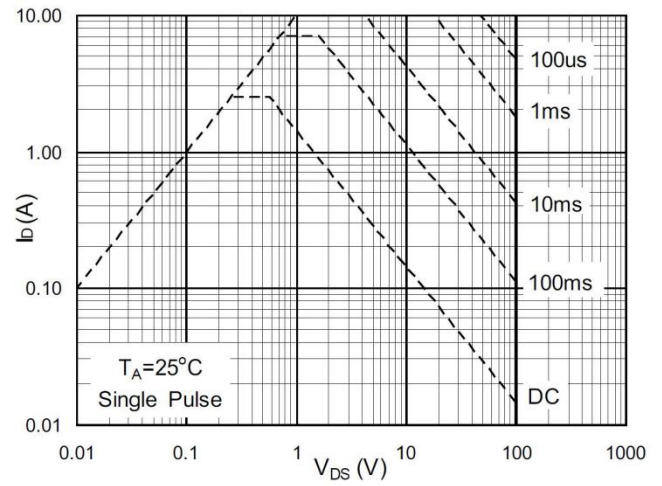
Normalized VGS(th) vs. TJ



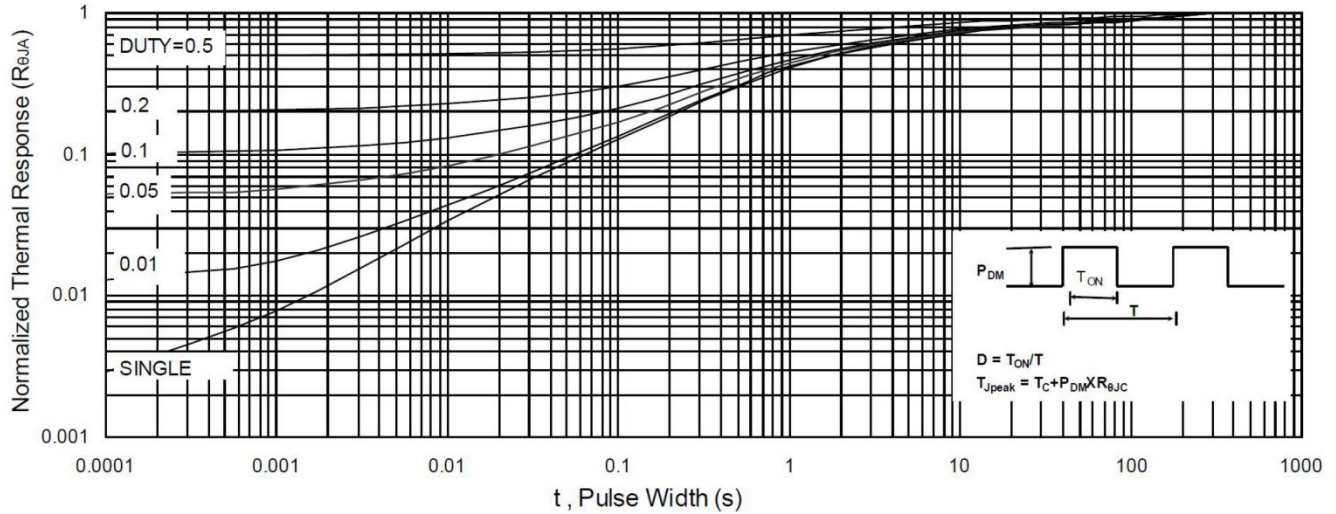
Normalized RDS(on) vs. TJ



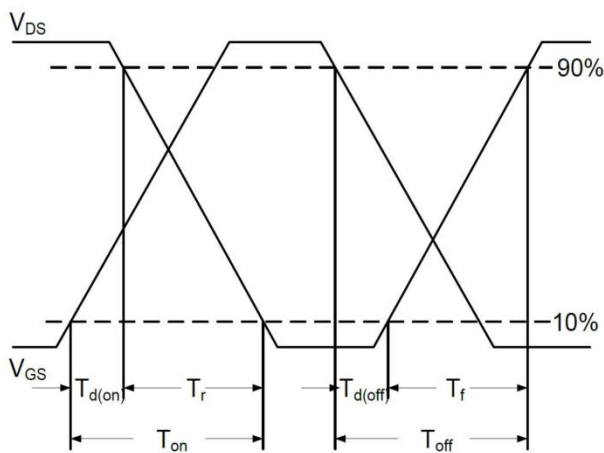
Capacitance



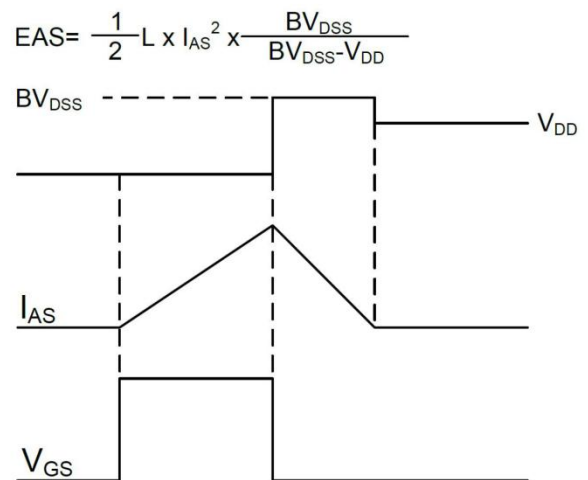
Safe Operating Area



Normalized Maximum Transient Thermal Impedance

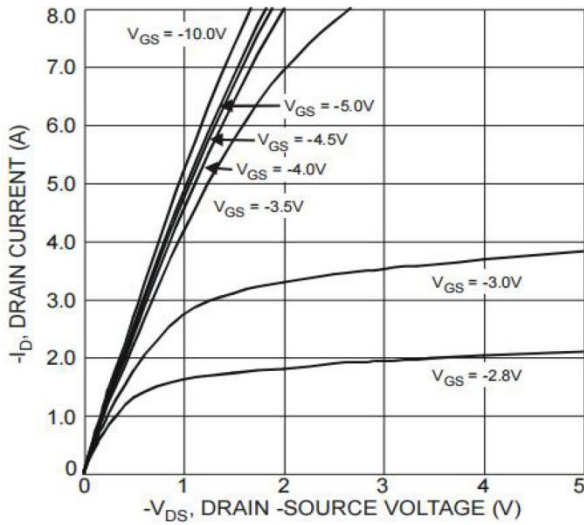


Switching Time Waveform

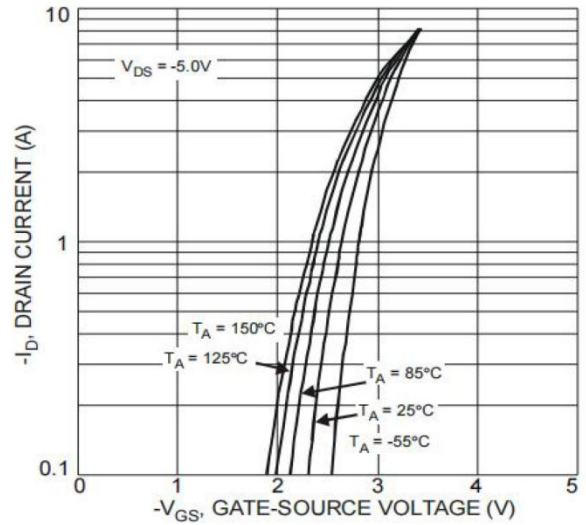


Unclamped Inductive Switching Waveform

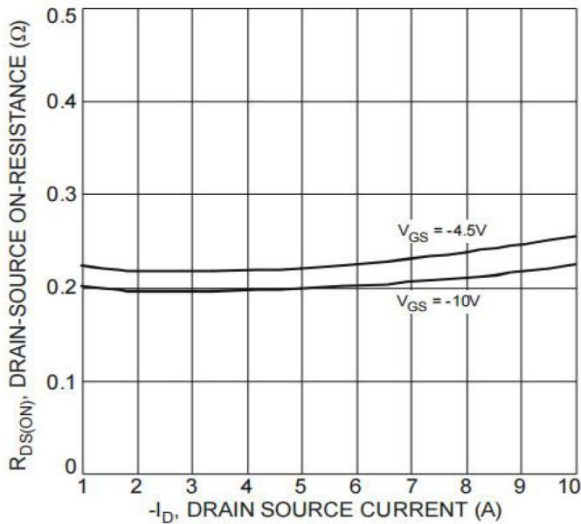
P-Channel Typical Characteristics



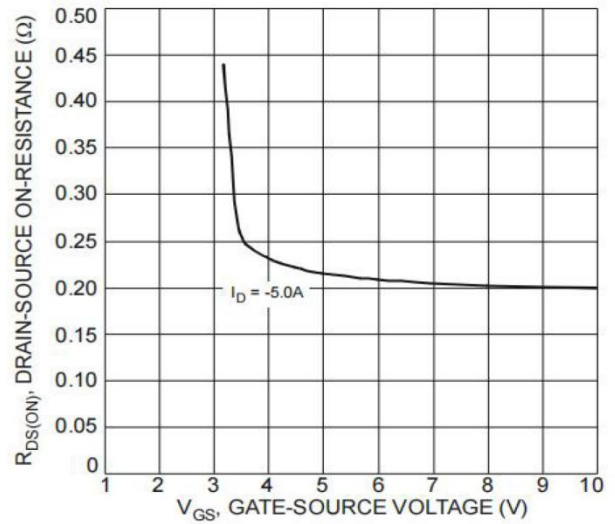
Typical Output Characteristics



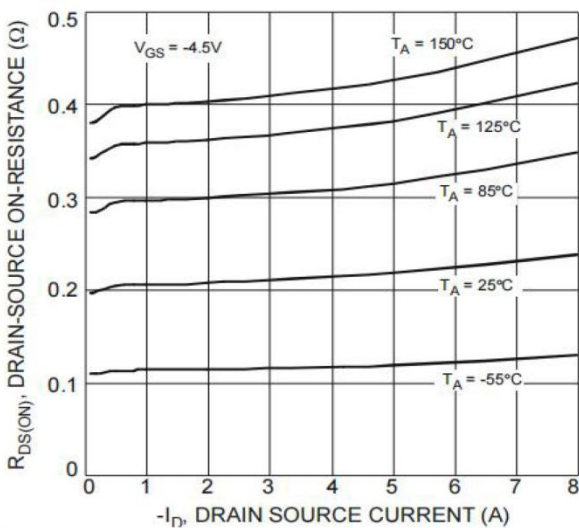
Transfer Characteristics



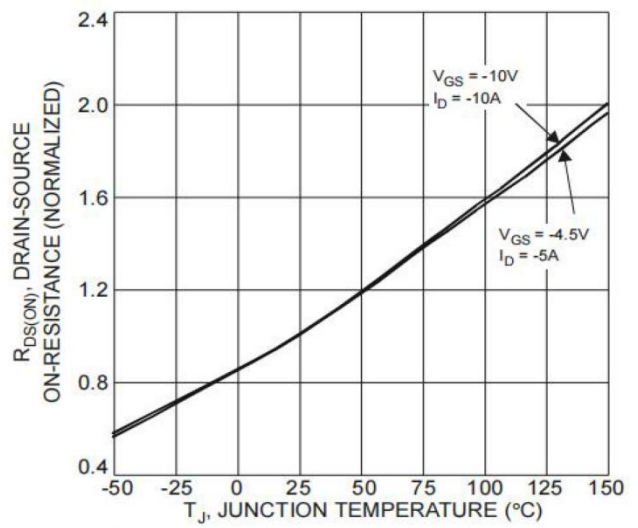
On-Resistance vs. Drain Current and Gate Voltage



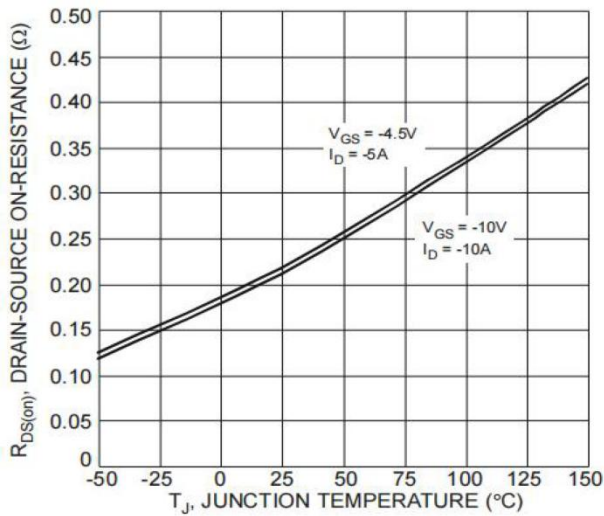
Drain-Source On-Resistance vs. Gate-Source Voltage



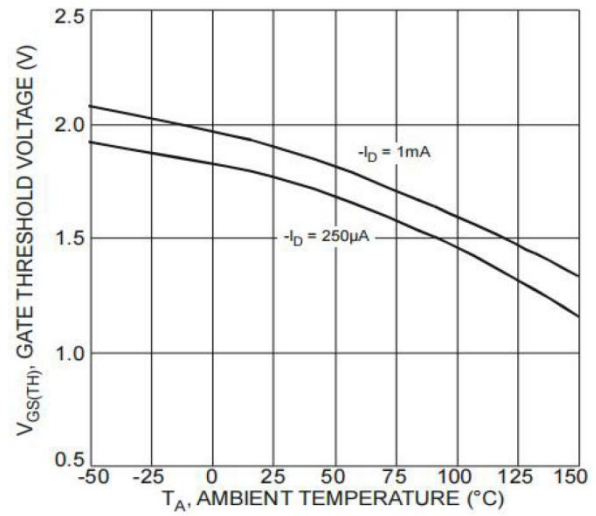
On-Resistance vs. Drain Current and Temperature



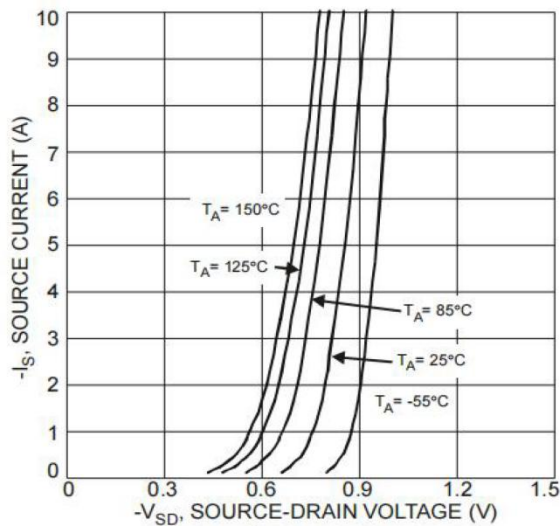
On-Resistance Variation with Temperature



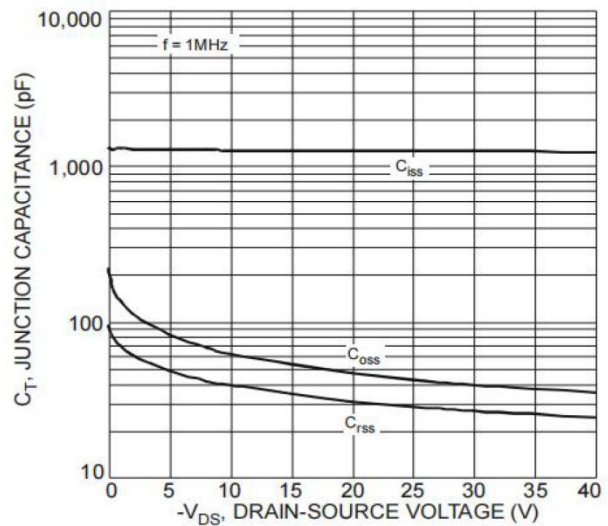
On-Resistance Variation with Temperature



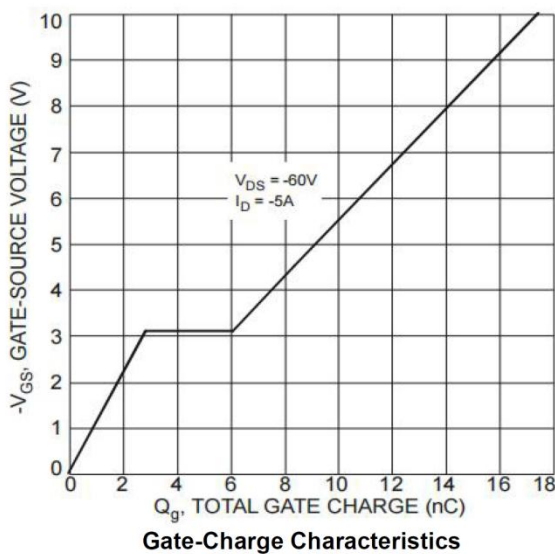
Gate Threshold Variation vs. Ambient Temperature



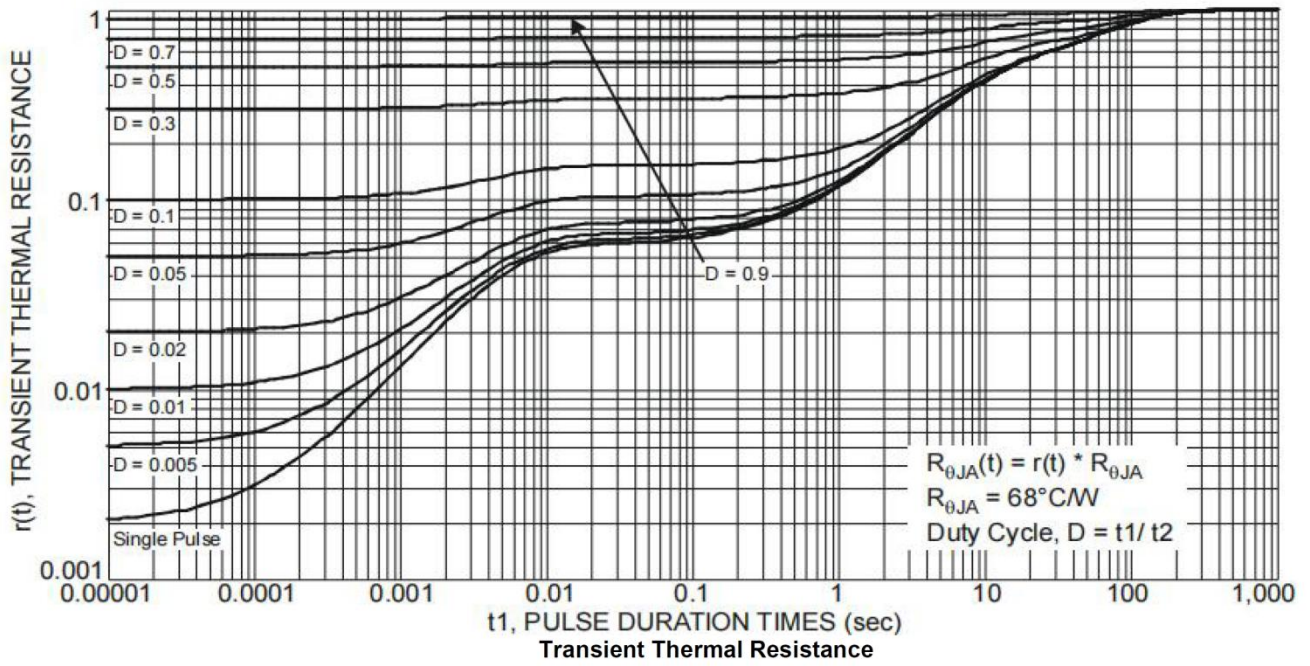
Diode Forward Voltage vs. Current



Typical Junction Capacitance

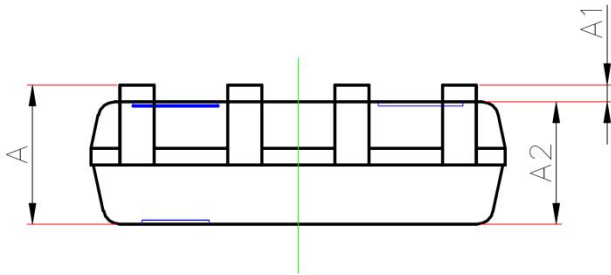
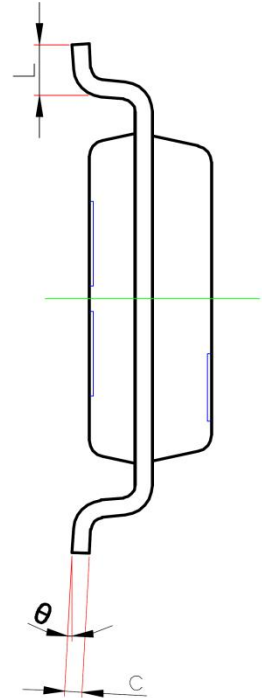
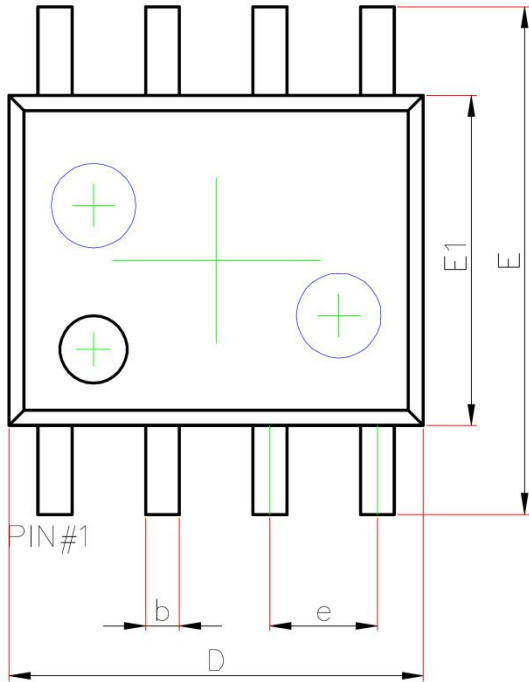


Gate-Charge Characteristics





SOP-8L Package Information



| Symbol | Dimensions In Millimeters | |
|--------|---------------------------|------|
| | Min. | Max. |
| A | 1.35 | 1.75 |
| A1 | 0.10 | 0.25 |
| A2 | 1.35 | 1.55 |
| b | 0.33 | 0.51 |
| c | 0.17 | 0.25 |
| D | 4.80 | 5.00 |
| e | 1.27 REF. | |
| E | 5.80 | 6.20 |
| E1 | 3.80 | 4.00 |
| L | 0.40 | 1.27 |
| θ | 0° | 8° |

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