

N-Channel 40-V_(D-S) MOSFET

| PRODUCT SUMMARY | | |
|-----------------------|-------------------------------|--------------------|
| B _{VDSS} (V) | R _{DS(on)} (mΩ)(MAX) | I _D (A) |
| 40 | 5.5@V _{GS} =10V | 18 |

SOP8 Pin Configuration



ABSOLUTE MAXIMUM RATINGS(T_C=25°C UNLESS OTHERWISE NOTED)

| Parameter | Symbol | Rating | Units |
|---|------------------|------------|-------|
| Drain-Source Voltage | V _{DS} | 40 | V |
| Gate-Source Voltage | V _{GS} | ±20 | V |
| Drain Current-Continuous(T _C =25°C) | I _D | 18 | A |
| Drain Current-Continuous(T _C =100°C) | | 10 | A |
| Drain Current-Pulsed ¹ | I _{DM} | 50 | A |
| Power Dissipation (T _C =25°C) | P _D | 18 | W |
| Power Dissipation-Derate above 25°C | | 0.59 | W/°C |
| Storage Temperature Range | T _{STG} | -55 to 150 | °C |
| Operating Junction Temperature Range | T _J | -55 to 150 | °C |

THERMAL CHARACTERISTICS

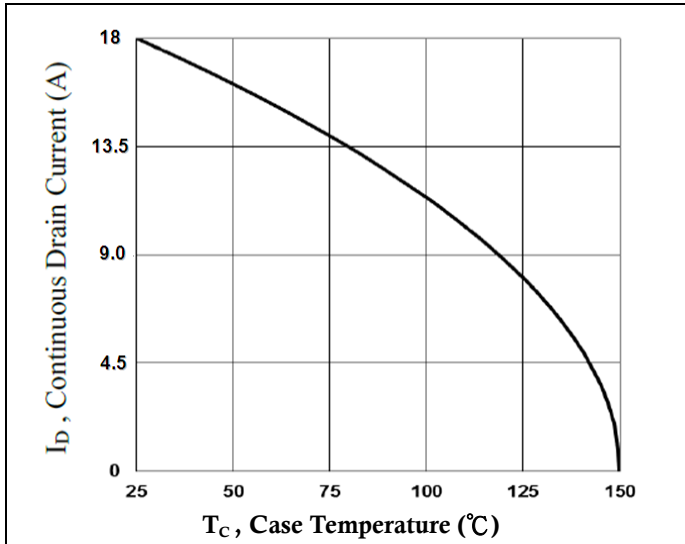
| Parameter | Symbol | Typ. | Max. | Unit |
|--|------------------|------|------|------|
| Thermal Resistance Junction to ambient | R _{θJA} | --- | 62 | °C/W |
| Thermal Resistance Junction to Case | R _{θJC} | --- | 1.7 | °C/W |

| ELECTRICAL CHARACTERISTICS (T _J =25°C UNLESS OTHERWISE NOTED) | | | | | | |
|--|-------------------------------------|--|------|------|------|-------|
| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =250uA | 40 | --- | --- | V |
| BV _{DSS} Temperature Coefficient | ΔBV _{DSS} /ΔT _J | Reference to 25°C, I _D =1mA | --- | 0.03 | --- | V/°C |
| Drain-Source Leakage Current | I _{DSS} | V _{GS} =0V, V _{DS} =40V, T _J =25°C | --- | --- | 1 | uA |
| | | V _{GS} =0V, V _{DS} =32V, T _J =85°C | --- | --- | 10 | uA |
| Gate-Source Leakage Current | I _{GSS} | V _{GS} =±20V, V _{DS} =0V | --- | --- | ±100 | nA |
| On Characteristics | | | | | | |
| Static Drain-Source On-Resistance | R _{DS(ON)} | V _{GS} =10V, I _D =18A | --- | 4.2 | 5.5 | mΩ |
| | | V _{GS} =4.5V, I _D =10A | --- | 5.3 | 7.0 | mΩ |
| Gate Threshold Voltage | V _{GS(th)} | V _{GS} =V _{DS} , I _D =250uA | 1.0 | 1.6 | 2.5 | V |
| V _{GS(th)} Temperature Coefficient | ΔV _{GS(th)} | | --- | -5.0 | --- | mV/°C |
| Forward Transconductance | g _{fs} | V _{DS} =10V, I _D =10A | --- | 16 | --- | S |
| Dynamic and Switching Characteristics | | | | | | |
| Total Gate Charge ^{2, 3} | Q _g | V _{GS} =4.5V, V _{DS} =32V, I _D =10A | --- | 25 | 50 | nC |
| Gate-Source Charge ^{2, 3} | Q _{gs} | | --- | 6.4 | 13 | |
| Gate-Drain Charge ^{2, 3} | Q _{gd} | | --- | 12.1 | 24 | |
| Turn-On Delay Time ^{2, 3} | T _{d(on)} | V _{GS} =10V, V _{DD} =20V, R _G =3.3Ω, I _D =1A | --- | 14.2 | 28 | ns |
| Rise Time ^{2, 3} | T _r | | --- | 18.3 | 36 | |
| Turn-Off Delay Time ^{2, 3} | T _{d(off)} | | --- | 38.8 | 76 | |
| Fall Time ^{2, 3} | T _f | | --- | 13.9 | 28 | |
| Input Capacitance | C _{iss} | V _{GS} =0V, V _{DS} =25V, F=1MHz | --- | 2410 | 3600 | pF |
| Output Capacitance | C _{oss} | | --- | 233 | 400 | |
| Reverse Transfer Capacitance | C _{rss} | | --- | 152 | 230 | |
| Gate resistance | R _g | V _{GS} =0V, V _{DS} =0V, F=1MHz | --- | 1.6 | 3.2 | Ω |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| Continuous Source Current | I _S | V _G =V _D =0V, Force Current | --- | --- | 18 | A |
| Pulsed Source Current | I _{SM} | | --- | --- | 50 | A |
| Diode Forward Voltage | V _{SD} | V _{GS} =0V, I _S =1A, T _J =25°C | --- | --- | 1.0 | V |

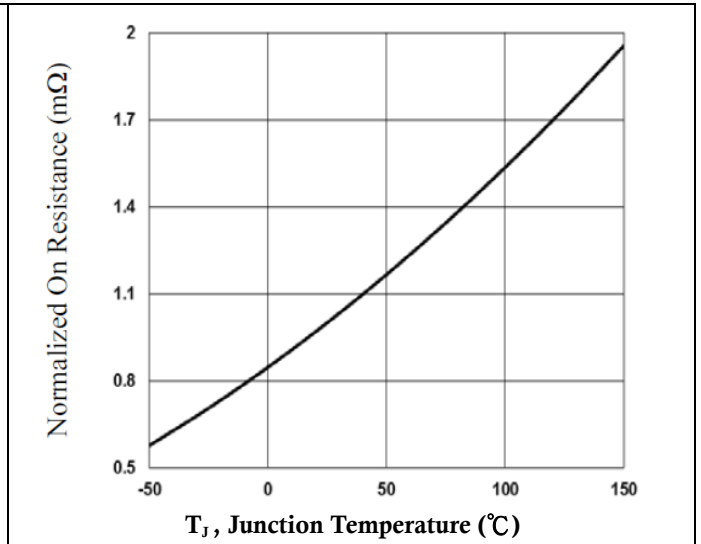
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

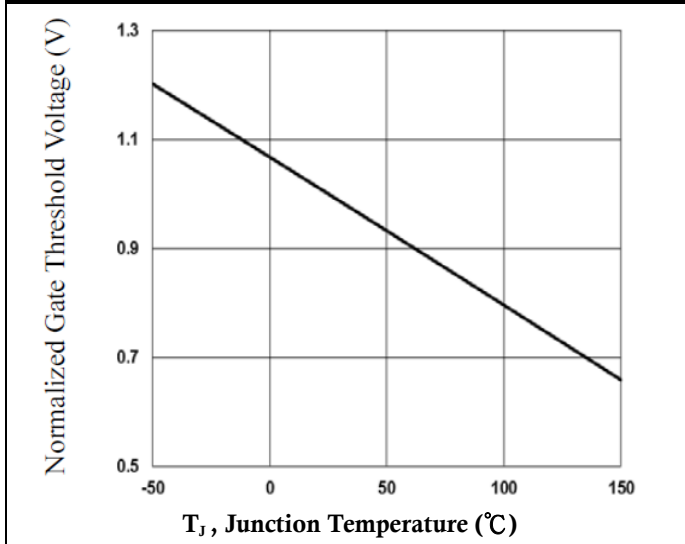
40V N-Channel MOSFETs



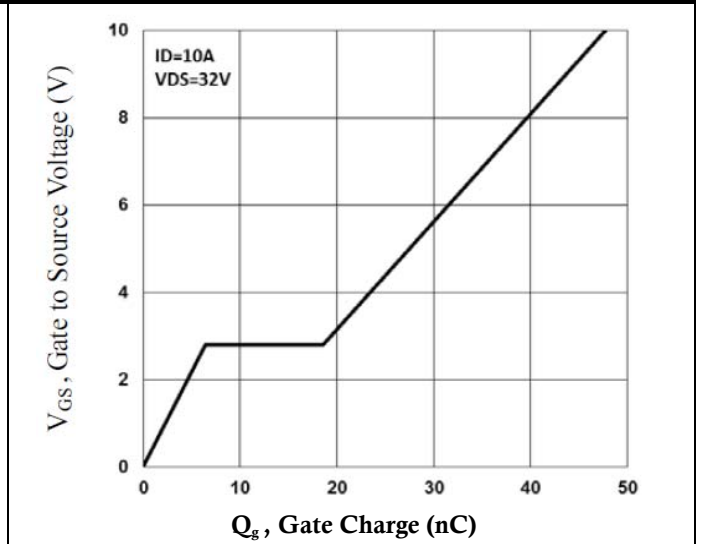
Continuous Drain Current vs. T_C



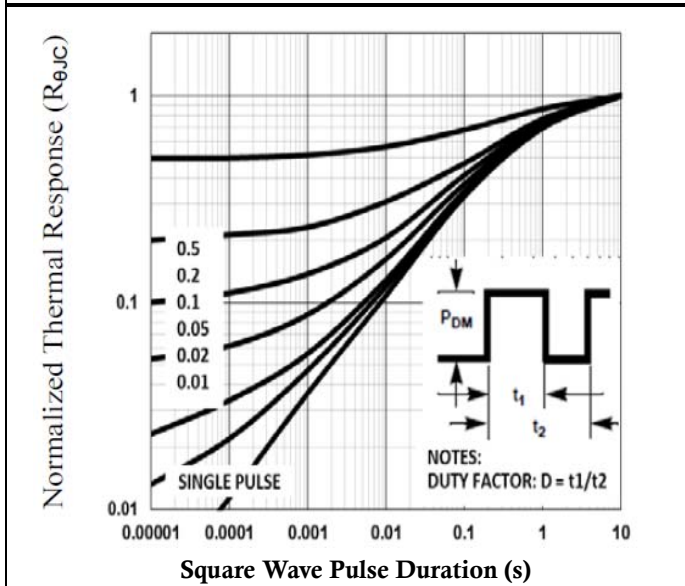
Normalized $R_{DS(ON)}$ vs. T_J



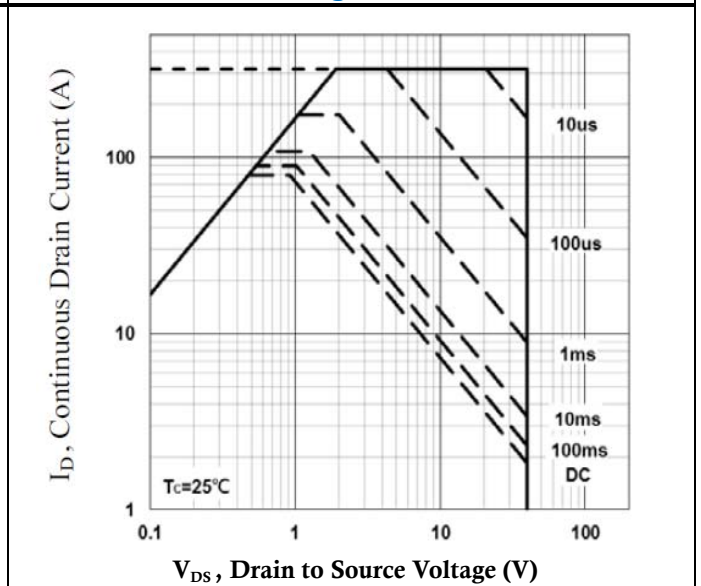
Normalized V_{th} vs. T_J



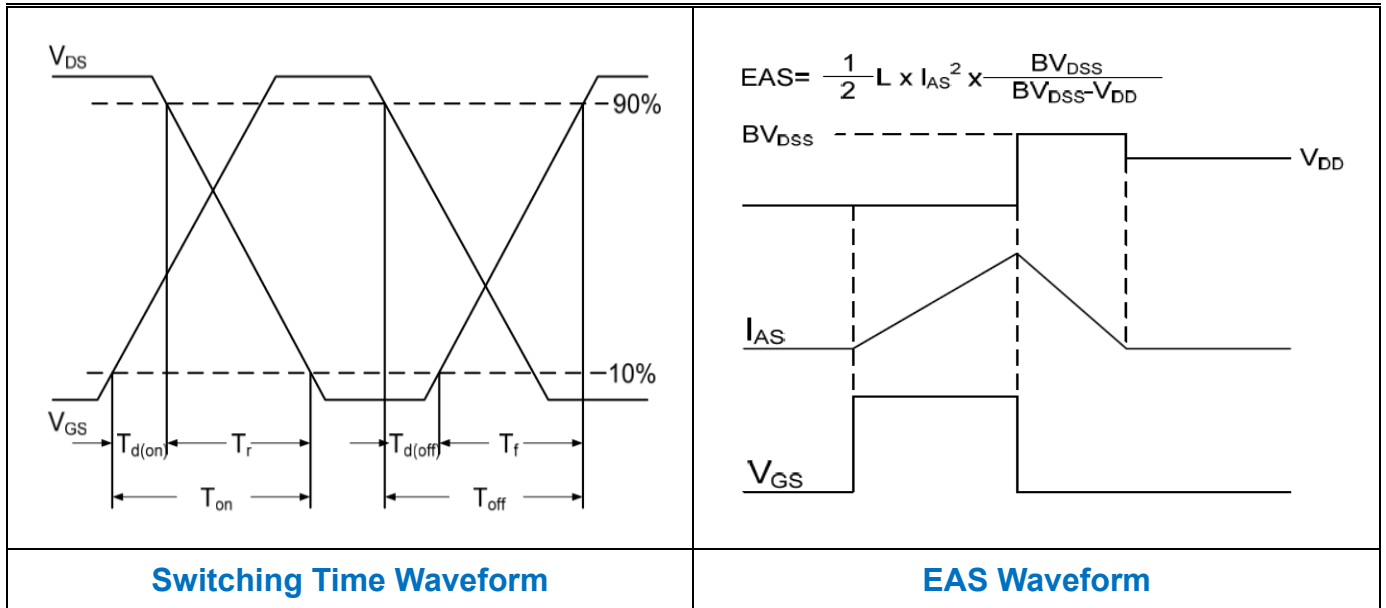
Gate Charge Waveform



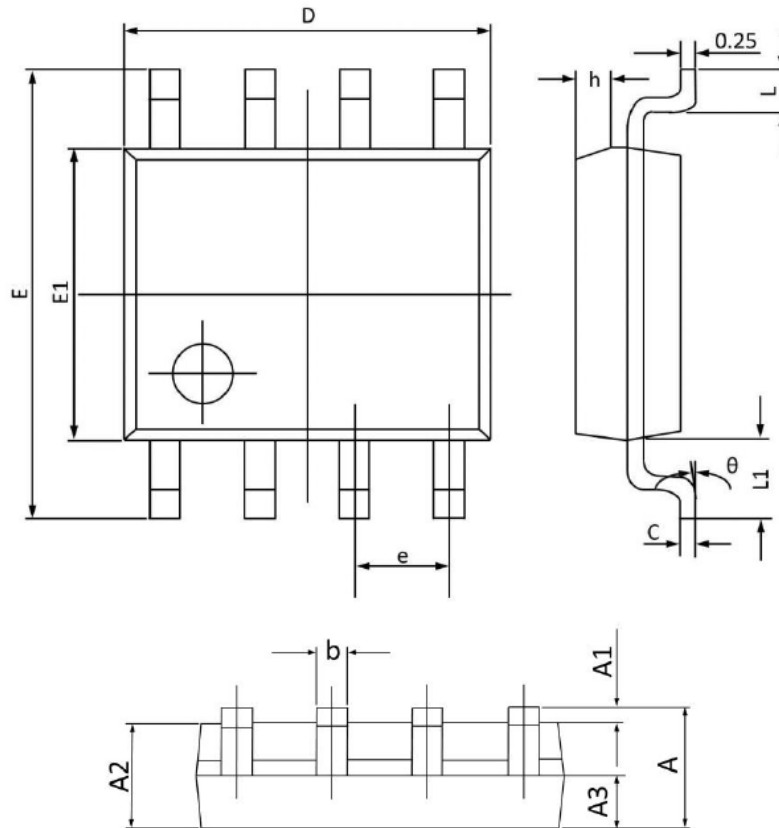
Normalized Transient Impedance



Maximum Safe Operation Area



SOP8 PACKAGE INFORMATION



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | MAX | MIN | MAX | MIN |
| A | 1.750 | 1.350 | 0.068 | 0.053 |
| A1 | 0.250 | 0.100 | 0.009 | 0.004 |
| A2 | 1.500 | 1.300 | 0.059 | 0.052 |
| A3 | 0.700 | 0.600 | 0.027 | 0.024 |
| b | 0.480 | 0.390 | 0.018 | 0.016 |
| c | 0.260 | 0.210 | 0.010 | 0.009 |
| D | 5.100 | 4.700 | 0.200 | 0.186 |
| E | 6.200 | 5.800 | 0.244 | 0.229 |
| E1 | 4.100 | 3.700 | 0.161 | 0.146 |
| e | 1.270(BSC) | | 0.050(BSC) | |
| h | 0.500 | 0.250 | 0.019 | 0.010 |
| L | 0.800 | 0.500 | 0.031 | 0.019 |
| L1 | 1.050(BSC) | | 0.041(BSC) | |
| θ | 8° | 0° | 8° | 0° |