

GENERAL FEATURES

- $V_{DS} = -30V$ $I_D = -60A$
- $R_{DS(ON)} < 11 m\Omega @ V_{GS}=10V$

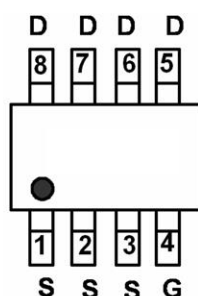
Application

- Load/Power Switching
- Interfacing Switching
- Logic Level Shift

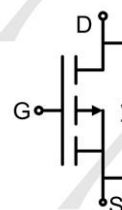
Package and Pin Configuration



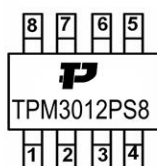
SOP-8 top view



Circuit diagram



Marking:



Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise noted)

| Symbol | Parameter | Rating | | Units |
|--------------------------|---|------------|--------------|-------------|
| | | 10s | Steady State | |
| V_{DS} | Drain-Source Voltage | -30 | | V |
| V_{GS} | Gate-Source Voltage | ± 20 | | V |
| $I_D @ T_C=25^{\circ}C$ | Continuous Drain Current, $V_{GS} @ -10V^1$ | -15 | | A |
| $I_D @ T_C=100^{\circ}C$ | Continuous Drain Current, $V_{GS} @ -10V^1$ | -12 | | A |
| $I_D @ T_A=25^{\circ}C$ | Continuous Drain Current, $V_{GS} @ -10V^1$ | -14.3 | -9 | A |
| $I_D @ T_A=70^{\circ}C$ | Continuous Drain Current, $V_{GS} @ -10V^1$ | -11.4 | -7.2 | A |
| IDM | Pulsed Drain Current ² | -130 | | A |
| EAS | Single Pulse Avalanche Energy ³ | 125 | | mJ |
| IAS | Avalanche Current | -50 | | A |
| $P_D @ T_C=25^{\circ}C$ | Total Power Dissipation ⁴ | 37 | | W |
| $P_D @ T_A=25^{\circ}C$ | Total Power Dissipation ⁴ | 4.2 | 1.67 | W |
| TSTG | Storage Temperature Range | -55 to 150 | | $^{\circ}C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | | $^{\circ}C$ |

Electrical Characteristics (T_A=25°C unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|--|---|------|---------|------|-------|
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =-250μA | -30 | --- | --- | V |
| ΔBV _{DSS} /ΔT _J | BVDSS Temperature Coefficient | Reference to 25°C, I _D =-1mA | --- | -0.0232 | --- | V/°C |
| R _{DS(ON)} | Static Drain-Source On-Resistance ² | V _{GS} =-10V, I _D =-10A | --- | --- | 11 | mΩ |
| | | V _{GS} =-4.5V, I _D =-8A | --- | --- | 20 | |
| V _{GS(th)} | Gate Threshold Voltage | | -1.2 | --- | -2.5 | V |
| ΔV _{GS(th)} | V _{GS(th)} Temperature Coefficient | V _{GS} =V _{DS} , I _D =-250μA | --- | 4.6 | --- | mV/°C |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =-24V, V _{GS} =0V, T _J =25°C | --- | --- | -1 | μA |
| | | V _{DS} =-24V, V _{GS} =0V, T _J =55°C | --- | --- | -5 | |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±20V, V _{DS} =0V | --- | --- | ±100 | nA |
| g _{fs} | Forward Transconductance | V _{DS} =-5V, I _D =-30A | --- | 30 | --- | S |
| R _g | Gate Resistance | V _{DS} =0V, V _{GS} =0V, f=1MHz | --- | 9 | --- | Ω |
| Q _g | Total Gate Charge (-4.5V) | | --- | 22 | --- | nC |
| Q _{gs} | Gate-Source Charge | V _{DS} =-15V, V _{GS} =-4.5V, I _D =-15A | --- | 8.7 | --- | |
| Q _{gd} | Gate-Drain Charge | | --- | 7.2 | --- | |
| T _{d(on)} | Turn-On Delay Time | | --- | 8 | --- | ns |
| T _r | Rise Time | V _{DD} =-15V, V _{GS} =-10V, R _G =3.3 | --- | 73.7 | --- | |
| T _{d(off)} | Turn-Off Delay Time | I _D =-15A | --- | 61.8 | --- | |
| T _f | Fall Time | | --- | 24.4 | --- | |
| C _{iss} | Input Capacitance | | --- | 2215 | --- | pF |
| C _{oss} | Output Capacitance | V _{DS} =-15V, V _{GS} =0V, f=1MHz | --- | 310 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 237 | --- | |
| I _S | Continuous Source Current ^{1,5} | V _G =V _D =0V, Force Current | --- | --- | -42 | A |
| I _{SM} | Pulsed Source Current ^{2,5} | | --- | --- | -130 | A |
| V _{SD} | Diode Forward Voltage ² | V _{GS} =0V, I _S =-1A, T _J =25°C | --- | --- | -1 | V |
| t _{rr} | Reverse Recovery Time | I _F =-15A, dI/dt=100A/μs, T _J =25°C | --- | 19 | --- | nS |
| Q _{rr} | Reverse Recovery Charge | | --- | 9 | --- | nC |

Typical Electrical and Thermal Characteristics

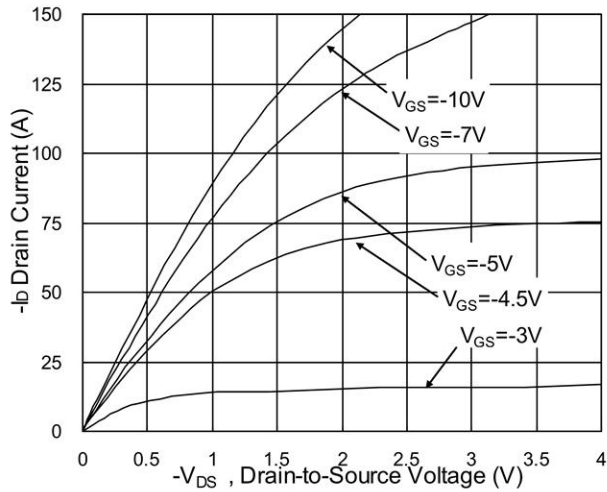


Fig.1 Typical Output Characteristics

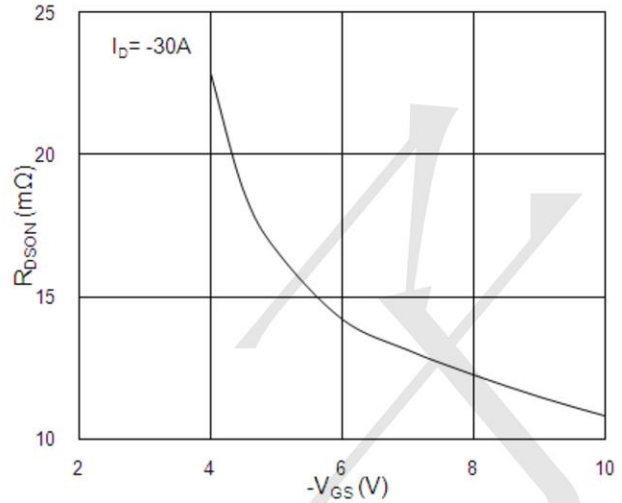


Fig.2 On-Resistance vs. G-S Voltage

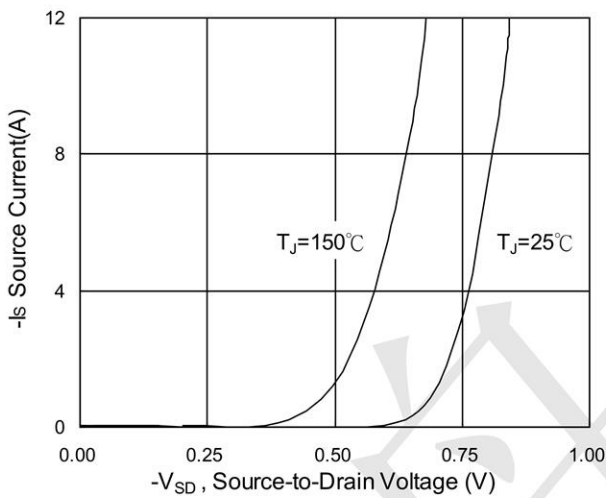


Fig.3 Forward Characteristics of Reverse

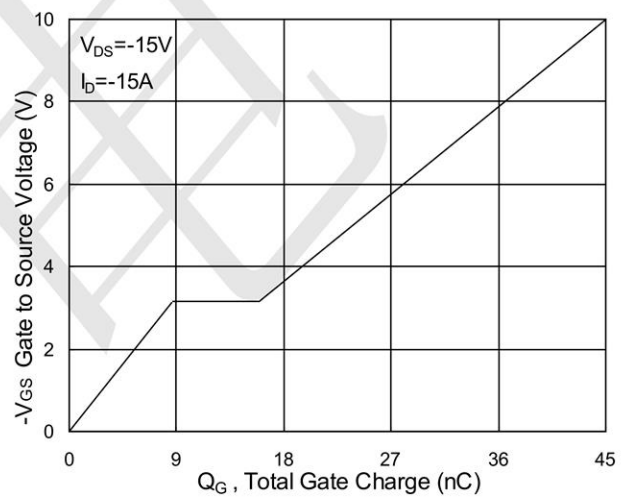


Fig.4 Gate-Charge Characteristics

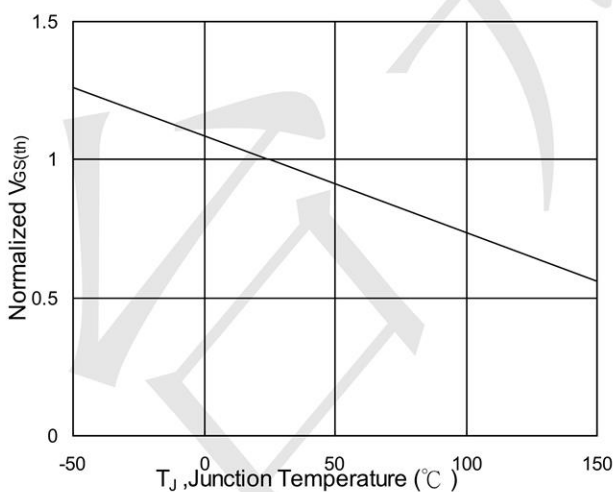


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

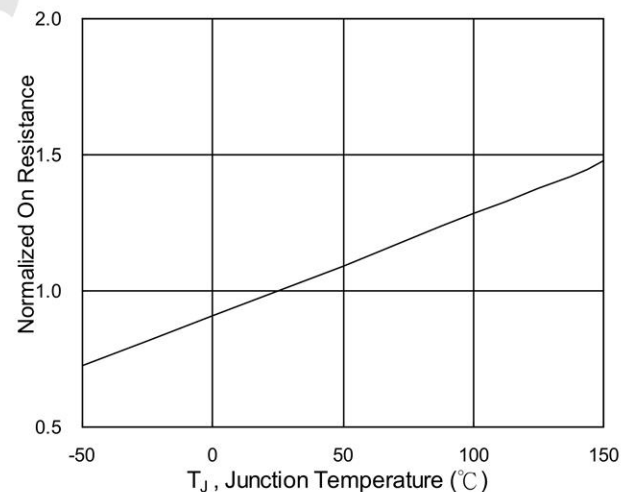


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

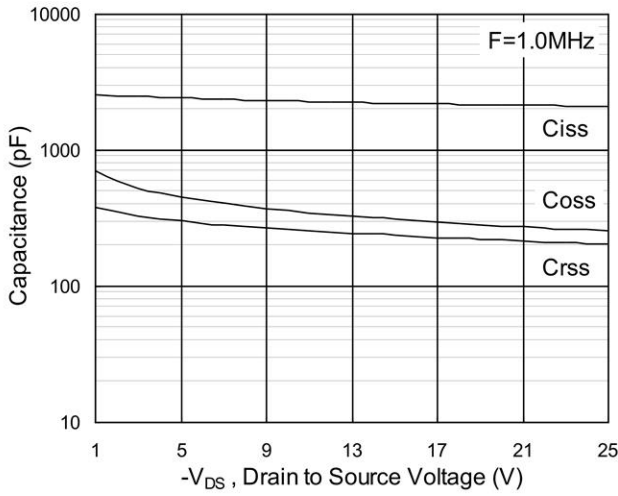


Fig.7 Capacitance

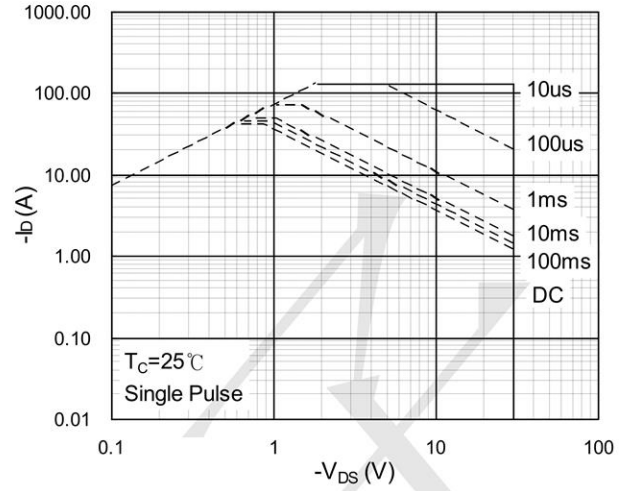


Fig.8 Safe Operating Area

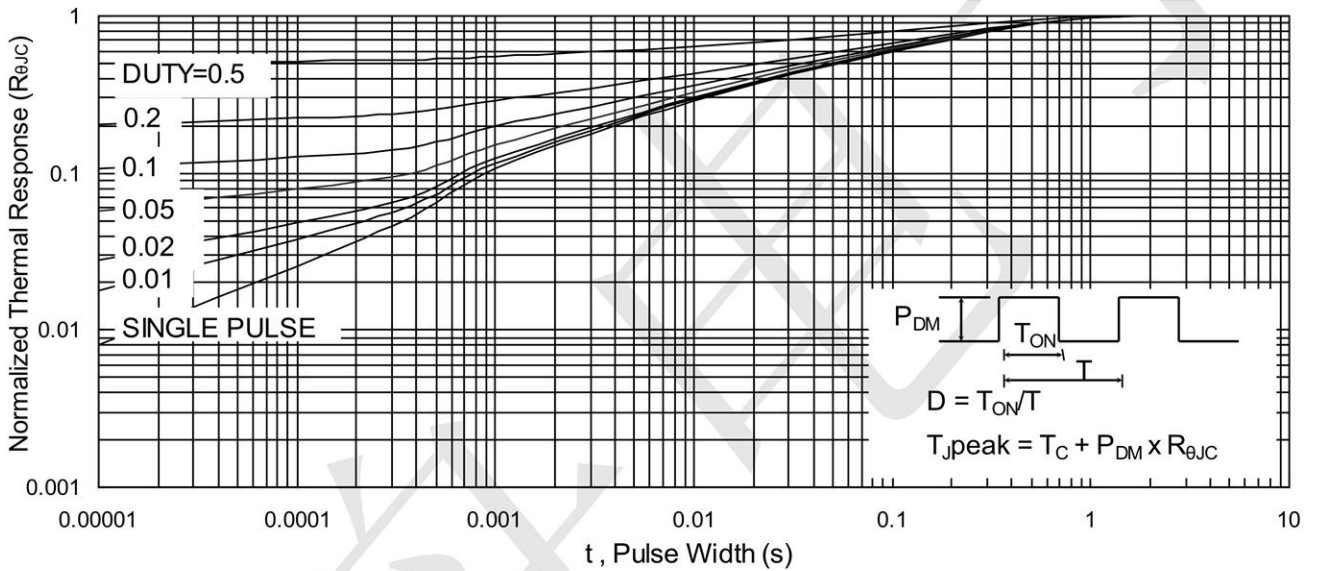


Fig.9 Normalized Maximum Transient Thermal Impedance

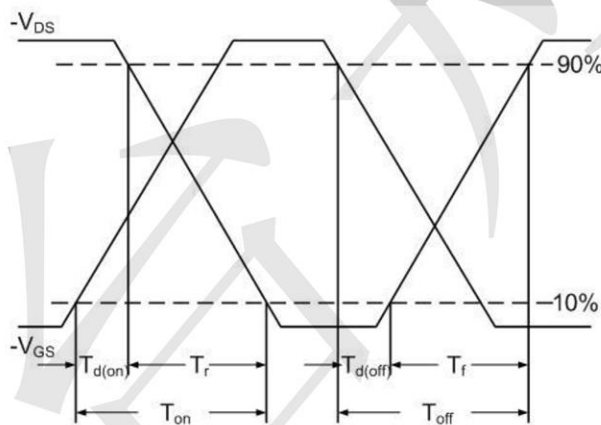


Fig.10 Switching Time Waveform

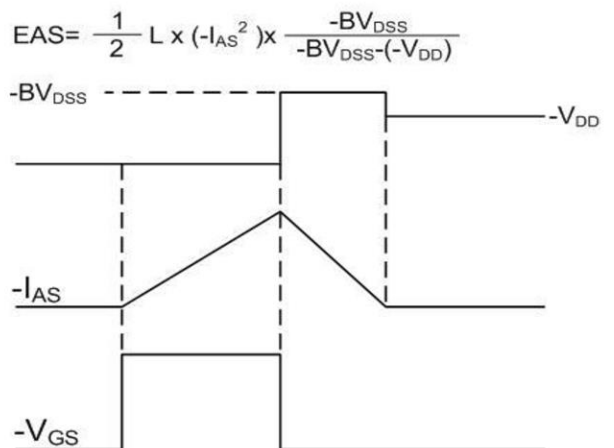
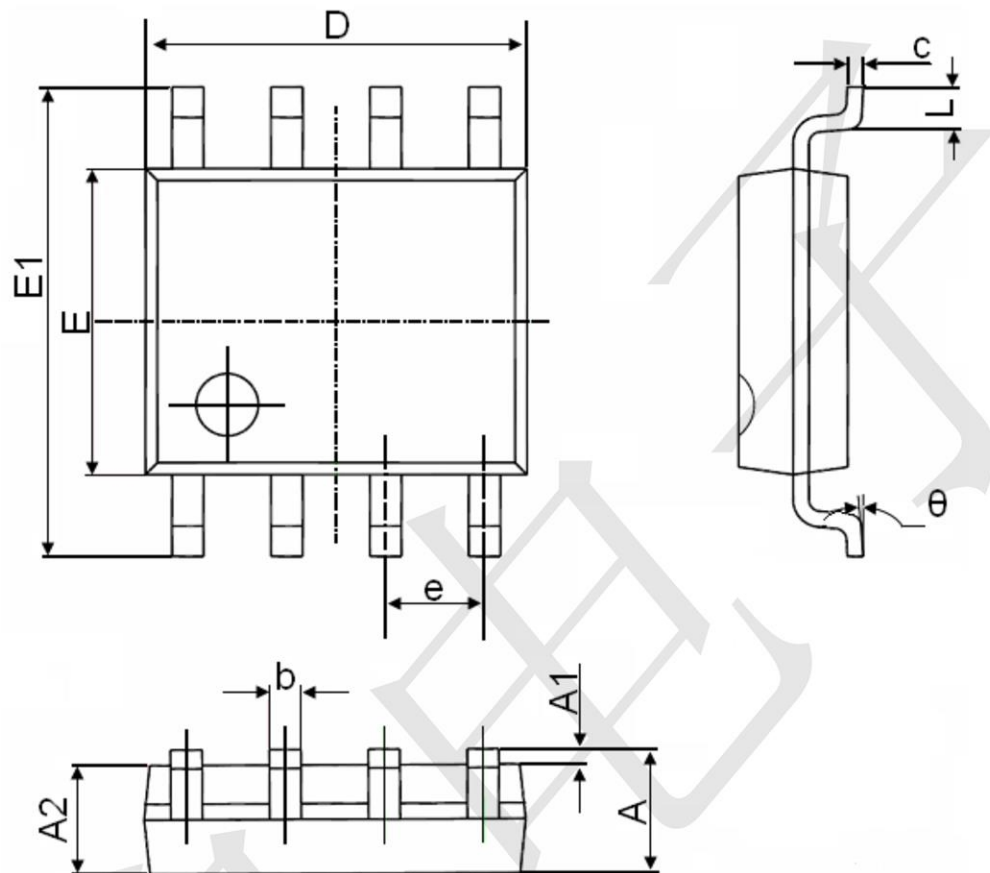


Fig.11 Unclamped Inductive Switching Waveform

SOP-8 Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.100 | 0.250 | 0.004 | 0.010 |
| A2 | 1.350 | 1.550 | 0.053 | 0.061 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.170 | 0.250 | 0.006 | 0.010 |
| D | 4.700 | 5.100 | 0.185 | 0.200 |
| E | 3.800 | 4.000 | 0.150 | 0.157 |
| E1 | 5.800 | 6.200 | 0.228 | 0.244 |
| e | 1.270(BSC) | | 0.050(BSC) | |
| L | 0.400 | 1.270 | 0.016 | 0.050 |
| θ | 0° | 8° | 0° | 8° |

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