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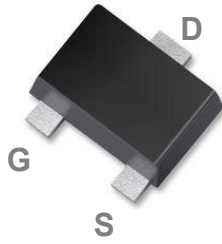


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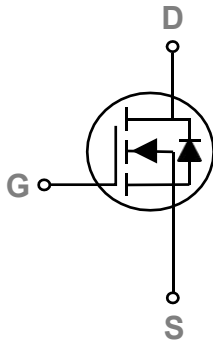


PLED

Product data sheet



SOT-723



Features

- 60V, 200mA, $R_{DS(ON)} = 1.7\Omega @ V_{GS} = 10V$
- Fast switching
- Green Device Available

Applications

- Notebook
- Smartphone
- Battery Protection
- Hand-held Instruments

| | | |
|-------|-------|-------|
| BVDSS | RDSON | ID |
| 60V | 1.7Ω | 200mA |

Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Rating | Units |
|-----------|---|------------|----------------------|
| V_{DS} | Drain-Source Voltage | 60 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| I_D | Drain Current – Continuous ($T_A=25^\circ\text{C}$) | 200 | mA |
| | Drain Current – Continuous ($T_A=70^\circ\text{C}$) | 160 | mA |
| I_{DM} | Drain Current – Pulsed ¹ | 800 | mA |
| P_D | Power Dissipation ($T_A=25^\circ\text{C}$) | 156 | mW |
| | Power Dissipation – Derate above 25°C | 1.25 | mW/ $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ\text{C}$ |

Thermal Characteristics

| Symbol | Parameter | Typ. | Max. | Unit |
|-----------------|--|------|------|---------------------------|
| $R_{\theta JA}$ | Thermal Resistance Junction to ambient | --- | 800 | $^\circ\text{C}/\text{W}$ |

Electrical Characteristics (T_J=25 °C, unless otherwise noted)
Off Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------|--------------------------------|--|------|------|------|------|
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V , I _D =250uA | 60 | --- | --- | V |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =60V , V _{GS} =0V , T _J =25°C | --- | --- | 10 | nA |
| | | V _{DS} =48V , V _{GS} =0V , T _J =125°C | --- | --- | 100 | nA |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±20V , V _{DS} =0V | --- | --- | ±100 | nA |

On Characteristics

| | | | | | | |
|---------------------|-----------------------------------|--|-----|-----|-----|---|
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} =10V , I _D =0.15A | --- | 1.6 | 3 | Ω |
| | | V _{GS} =4.5V , I _D =0.1A | --- | 1.7 | 4 | |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250uA | 1.0 | 2 | 3.0 | V |
| g _{fs} | Forward Transconductance | V _{DS} =10V , I _D =0.1A | --- | 0.3 | --- | S |

Dynamic and switching Characteristics

| | | | | | |
|---------------------|-------------------------------------|--|-----|-----|----|
| Q _g | Total Gate Charge ^{2, 3} | V _{DS} =30V , V _{GS} =10V , I _D =0.1A | --- | 2 | nC |
| Q _{gs} | Gate-Source Charge ^{2, 3} | | --- | 0.9 | |
| Q _{gd} | Gate-Drain Charge ^{2, 3} | | --- | 0.4 | |
| T _{d(on)} | Turn-On Delay Time ^{2, 3} | V _{DD} =30V , V _{GS} =10V , R _G =6Ω I _D =0.1A | --- | 3 | ns |
| T _r | Rise Time ^{2, 3} | | --- | 5 | |
| T _{d(off)} | Turn-Off Delay Time ^{2, 3} | | --- | 14 | |
| T _f | Fall Time ^{2, 3} | | --- | 9 | |
| C _{iss} | Input Capacitance | V _{DS} =30V , V _{GS} =0V , F=1MHz | --- | 25 | pF |
| C _{oss} | Output Capacitance | | --- | 15 | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 6.8 | |

Drain-Source Diode Characteristics and Maximum Ratings

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|---------------------------|---|------|------|------|------|
| I _S | Continuous Source Current | V _G =V _D =0V , Force Current | --- | --- | 200 | mA |
| I _{SM} | Pulsed Source Current | | --- | --- | 400 | mA |
| V _{SD} | Diode Forward Voltage | V _{GS} =0V , I _S =0.1A , T _J =25°C | --- | --- | 1 | V |
| T _{rr} | Reverse Recovery Time | V _R =50V , I _S =0.1A , | | 18 | | ns |
| Q _{rr} | Reverse Recovery Charge | dI/dt=100A/μs , T _J =25°C | | 6 | | nC |

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.

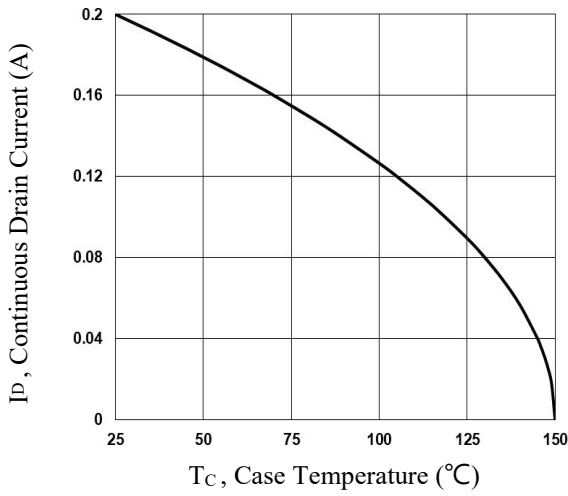


Fig.1 Continuous Drain Current vs. T_C

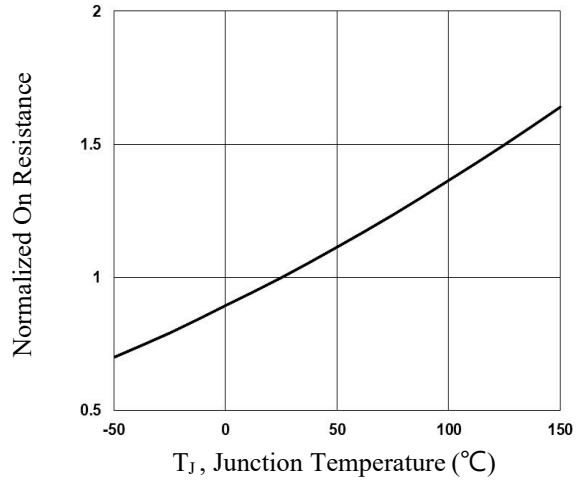


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

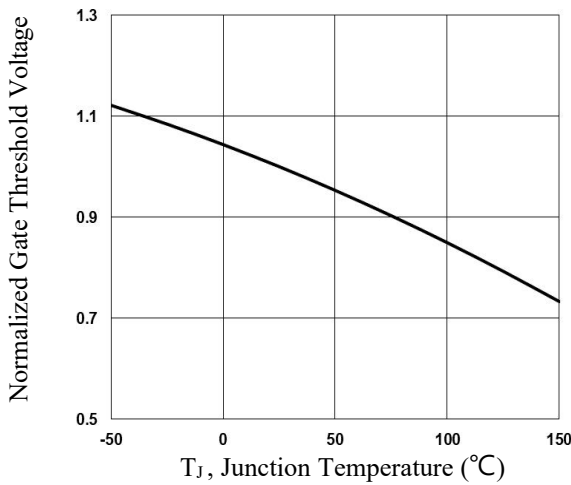


Fig.3 Normalized V_{th} vs. T_J

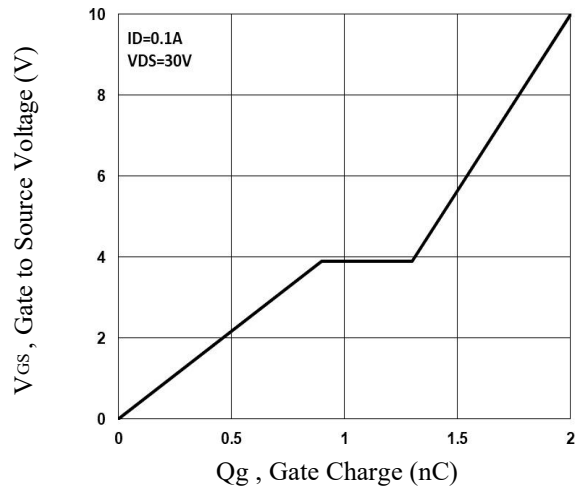


Fig.4 Gate Charge Waveform

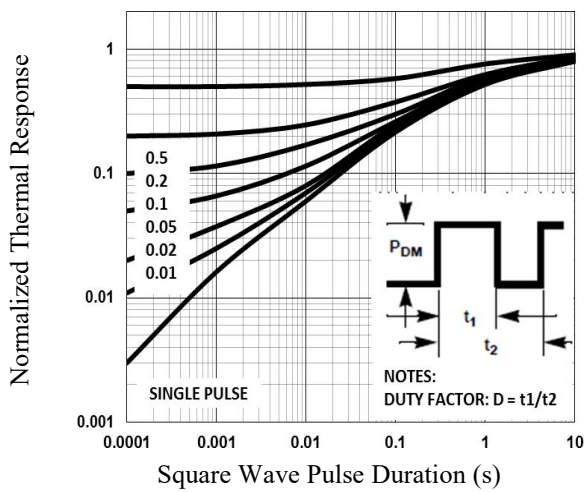


Fig.5 Normalized Transient Response

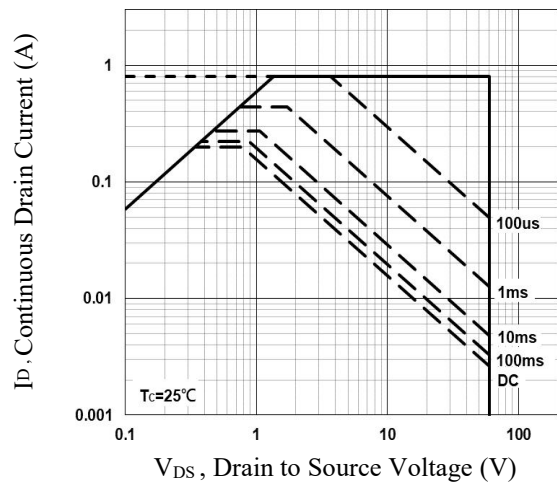


Fig.6 Maximum Safe Operation Area

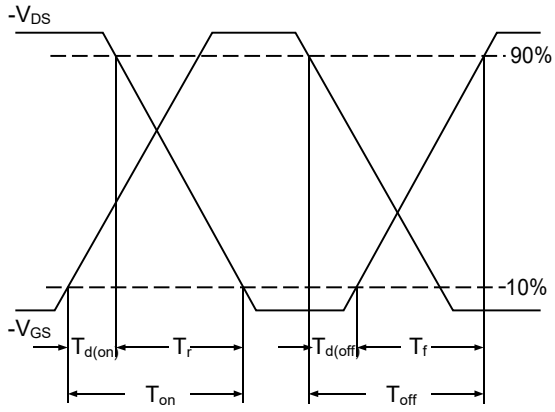


Fig.7 Switching Time Waveform

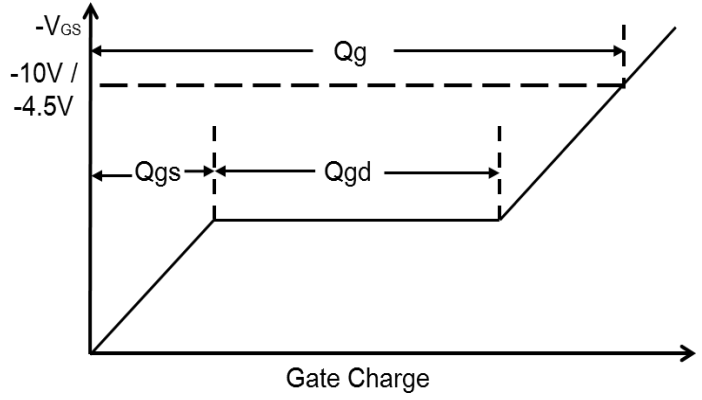
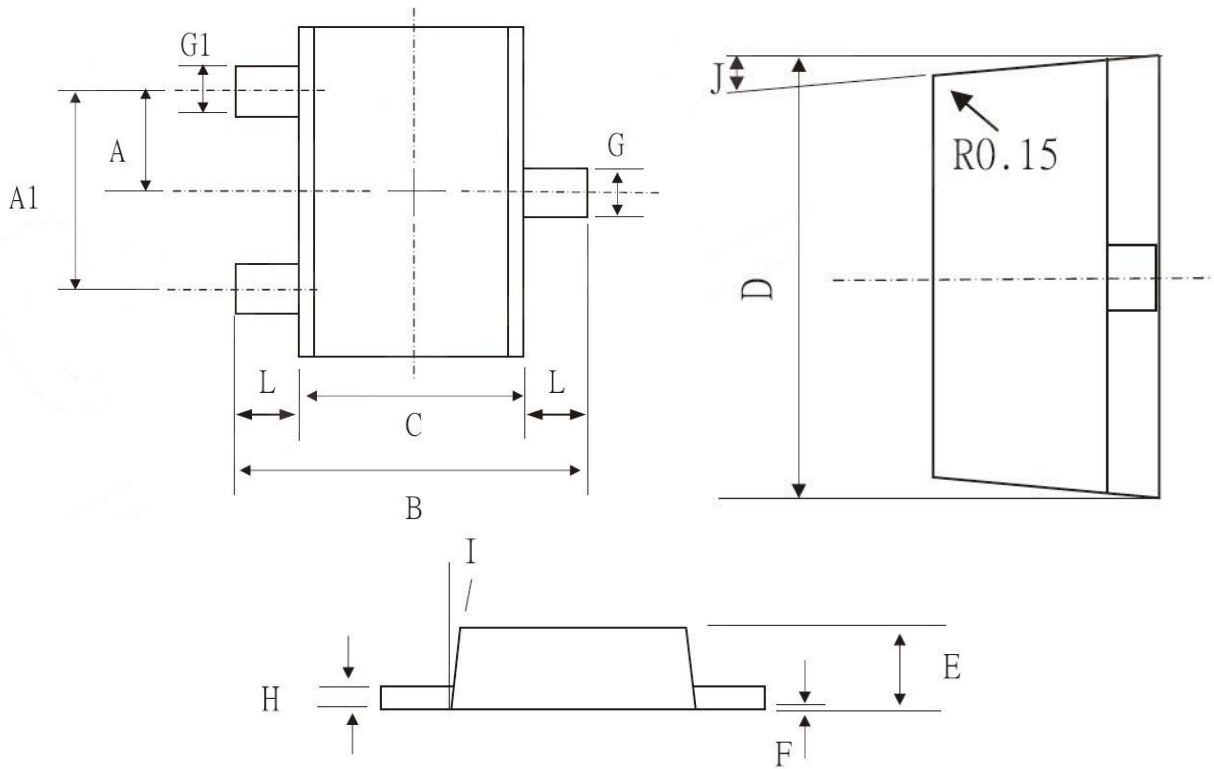


Fig.8 Gate Charge Waveform

SOT-723 PACKAGE INFORMATION



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | MAX | MIN | MAX | MIN |
| A | 0.4BSC | | 0.016BSC | |
| A1 | 0.8BSC | | 0.031BSC | |
| B | 1.250 | 1.150 | 0.049 | 0.045 |
| C | 0.850 | 0.750 | 0.033 | 0.030 |
| D | 1.250 | 1.150 | 0.049 | 0.045 |
| E | 0.390 | 0.370 | 0.015 | 0.015 |
| F | 0.050 | 0.000 | 0.002 | 0.000 |
| G | 0.270 | 0.220 | 0.011 | 0.009 |
| G1 | 0.220 | 0.170 | 0.009 | 0.007 |
| H | 0.110 | 0.009 | 0.004 | 0.000 |
| I | 13° | 9° | 13° | 9° |
| L | 0.250 | 0.150 | 0.010 | 0.006 |
| J | 11° | 7° | 11° | 7° |

REEL SPECIFICATION

| P/N | PKG | QTY |
|----------|---------|------|
| 2N7002KM | SOT-723 | 8000 |

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