

Description

The MOSFET provide the best combination of fast switching, low on-resistance and cost-effectiveness.

MOSFET Product Summary

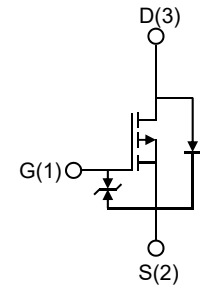
| $V_{DS}(V)$ | $R_{DS(on)}(\Omega)$ | $I_D(mA)$ |
|-------------|------------------------|-----------|
| -30 | 0.48@ $V_{GS} = -10V$ | -200 |
| | 0.68@ $V_{GS} = -4.5V$ | |
| | 0.75@ $V_{GS} = -4V$ | |

Feature

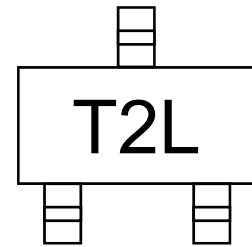
- Low On-resistance.
- Low Gate Threshold Voltage
- Fast Switching Speed
- Small Surface Mount Package
- ESD Protected Gate

Applications

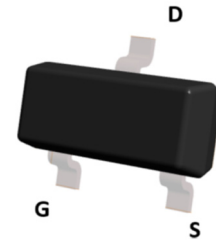
- Switching
- Power Management Functions



Schematic diagram



Marking (Top View)



SOT-523 (Top View)

Absolute maximum rating@25°C

| Rating | Symbol | Value | Units |
|--|-----------------------|----------|-------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ± 10 | V |
| Drain Current-Continuous | I_D | -200 | mA |
| Pulsed Drain Current | $I_{DP}^{(1)}$ | -400 | mA |
| Maximum Power Dissipation | $P_D^{(2)}$ | 150 | mW |
| Junction and Storage Temperature Range | T_J, T_{STG} | -55~+150 | °C |
| Thermal Resistance Junction-to-Ambient | $R_{\theta JA}^{(2)}$ | 833 | °C/W |

Notes:

1. $P_w \leq 10\mu s$, Duty cycle $\leq 1\%$
2. Each terminal mounted on a recommended land

Electrical characteristics per line@25°C (unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|--------------|--|------|------|----------|----------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS} = 0V, I_D = -1.0mA$ | -30 | - | - | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = -30V, V_{GS} = 0V$ | - | - | -1 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS} = \pm 10V, V_{DS} = 0V$ | - | - | ± 10 | μA |
| On Characteristics | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250\mu A$ | -0.5 | - | -1.5 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS} = -10V, I_D = -200mA$ | - | 0.48 | 1.0 | Ω |
| | | $V_{GS} = -4.5V, I_D = -150mA$ | - | 0.68 | 1.2 | |
| | | $V_{GS} = -4V, I_D = -150mA$ | - | 0.75 | 1.5 | |
| Forward Transfer Admittance | $ Y_{fs} $ | $V_{DS} = -10V, I_D = -150mA$ | 0.2 | - | - | s |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = -10V, V_{GS} = 0V,$ $f = 1.0MHz$ | - | 66 | - | pF |
| Output Capacitance | C_{oss} | | - | 17 | - | pF |
| Reverse Transfer Capacitance | C_{rss} | | - | 10 | - | pF |
| Switching Characteristics | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD} = -15V, I_D = 0.15A,$ $V_{GS} = -10V, R_L = 100\Omega,$ $R_G = 10\Omega$ | - | 3.9 | - | ns |
| Turn-on Rise Time | t_r | | - | 1.9 | - | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 12 | - | ns |
| Turn-Off Fall Time | t_f | | - | 3.2 | - | ns |
| Total Gate Charge | Q_g | $V_{DS} = -15V, I_D = -0.25A,$ $V_{GS} = 10V$ | - | 1.4 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 0.1 | - | nC |
| Gate-Drain Charge | Q_{gd} | | - | 0.2 | - | nC |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage | V_{SD} | $V_{GS} = 0V, I_S = -0.2A$ | - | - | -1.2 | V |

Typical Characteristics

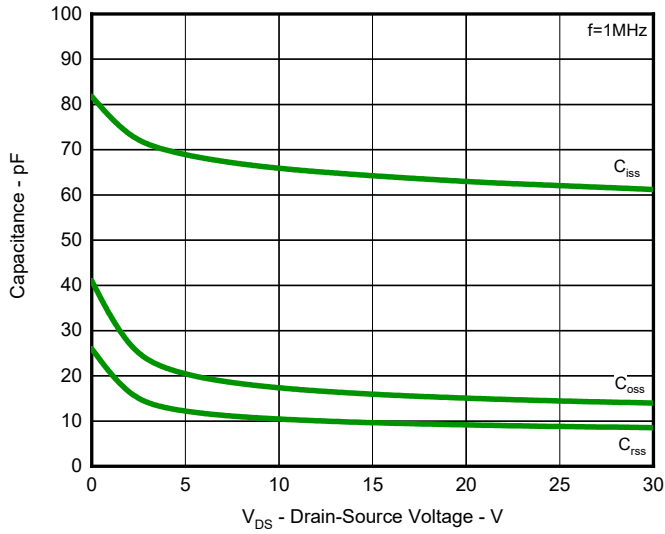


Fig.1 Capacitance vs. Drain-Source Voltage

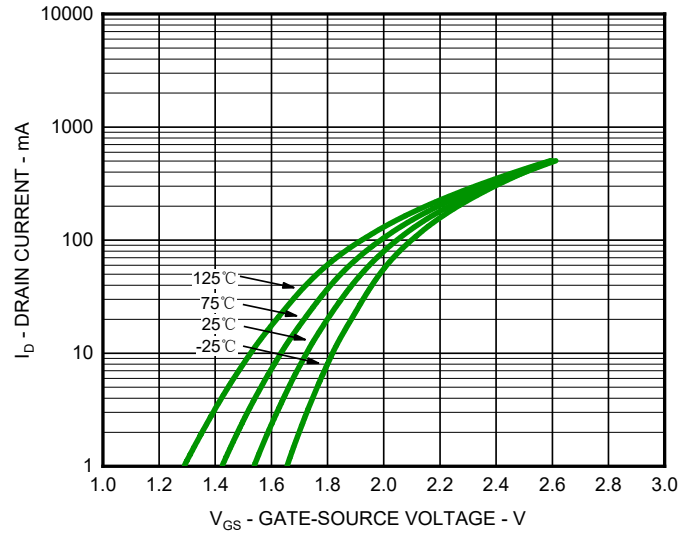


Fig.2 Typical Transfer Characteristics

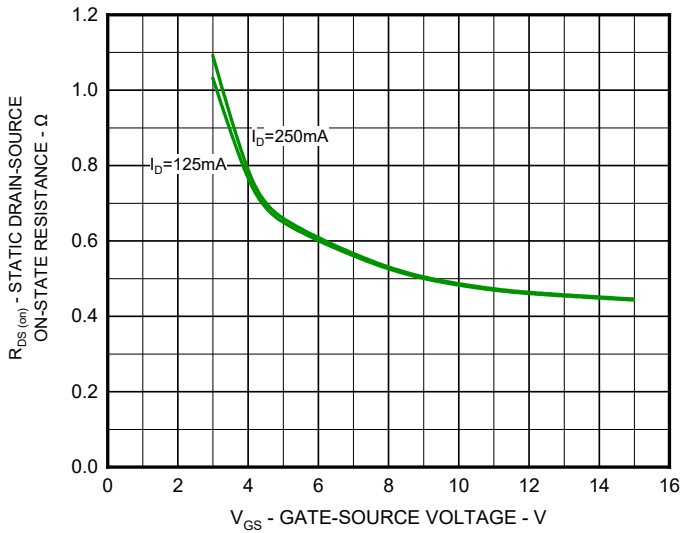


Fig.3 $R_{DS(on)}$ vs. V_{GS}

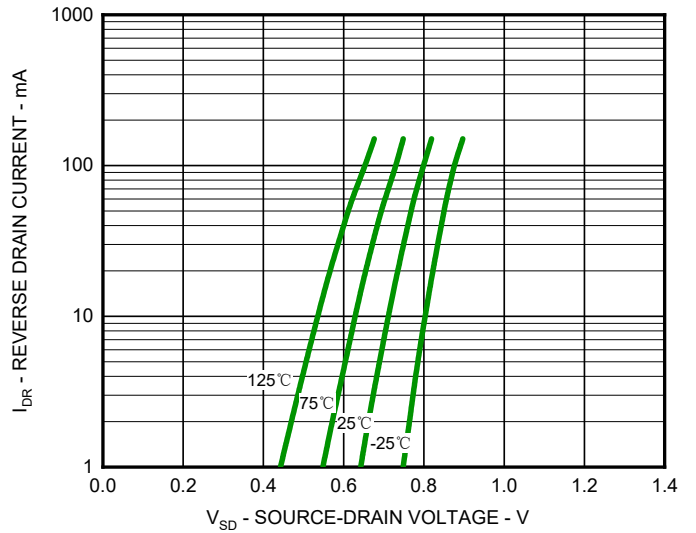


Fig.4 Reverse Drain Current vs. Source-Drain Voltage

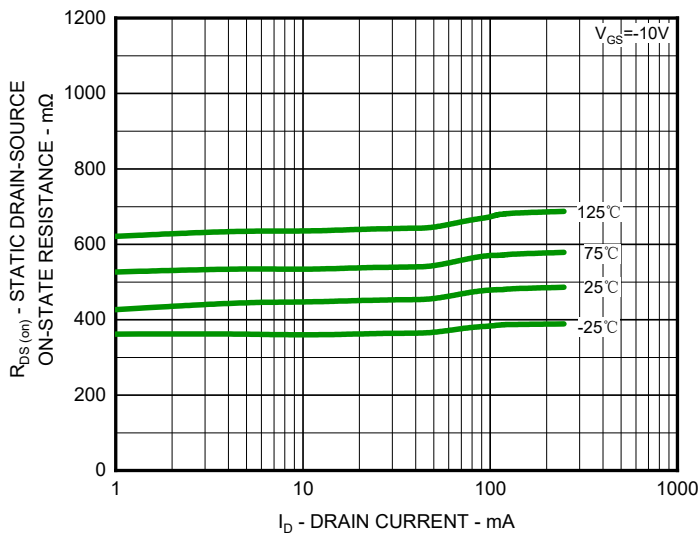


Fig.5 $R_{DS(on)}$ vs. I_D (I)

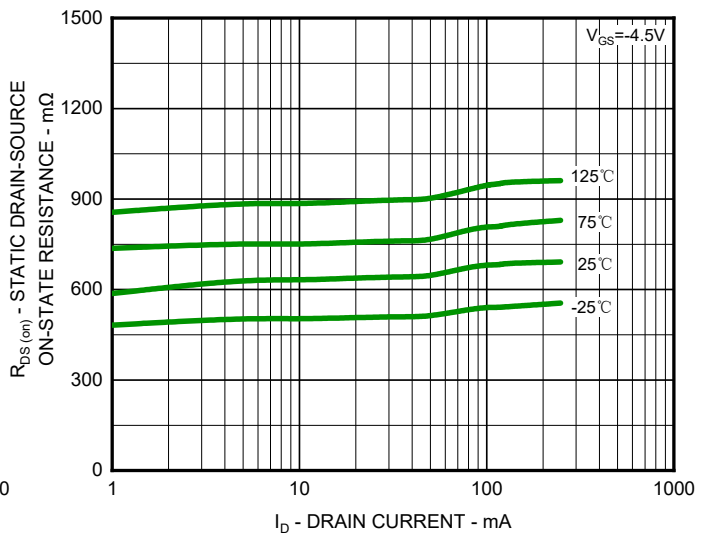


Fig.6 $R_{DS(on)}$ vs. I_D (II)

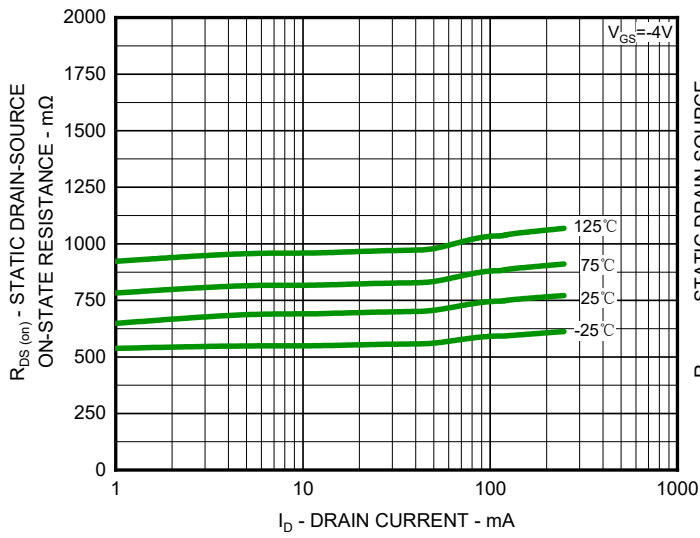


Fig.7 $R_{DS(ON)}$ vs. I_D (III)

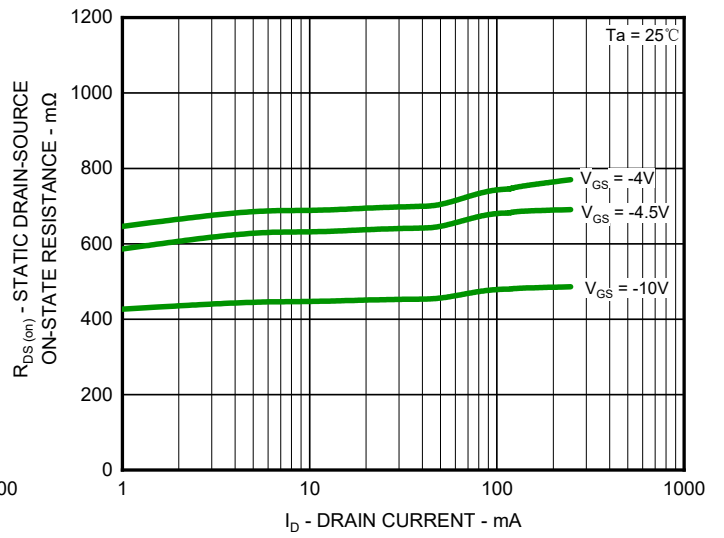
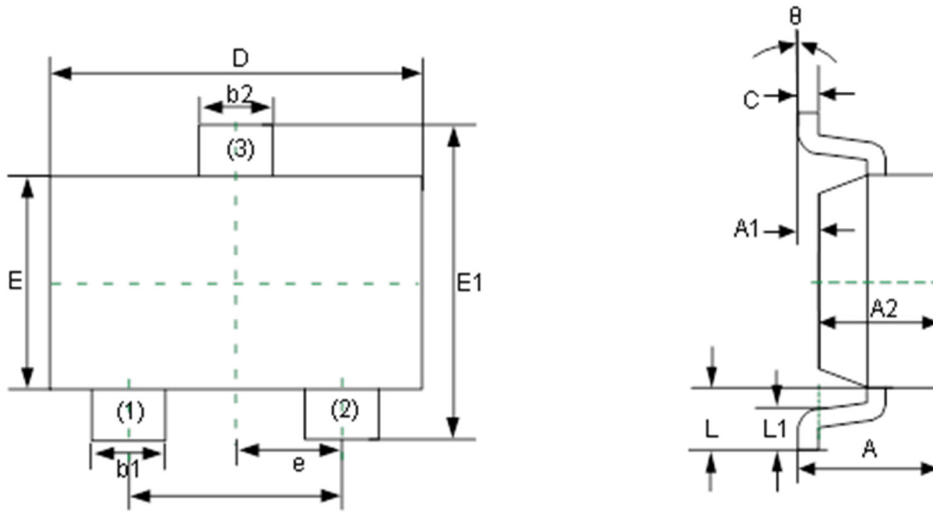
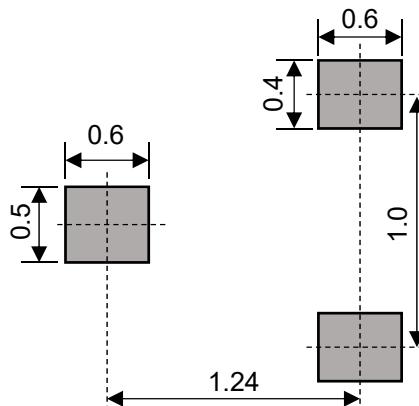


Fig.8 $R_{DS(ON)}$ vs. I_D (IV)

Product dimension (SOT-523)



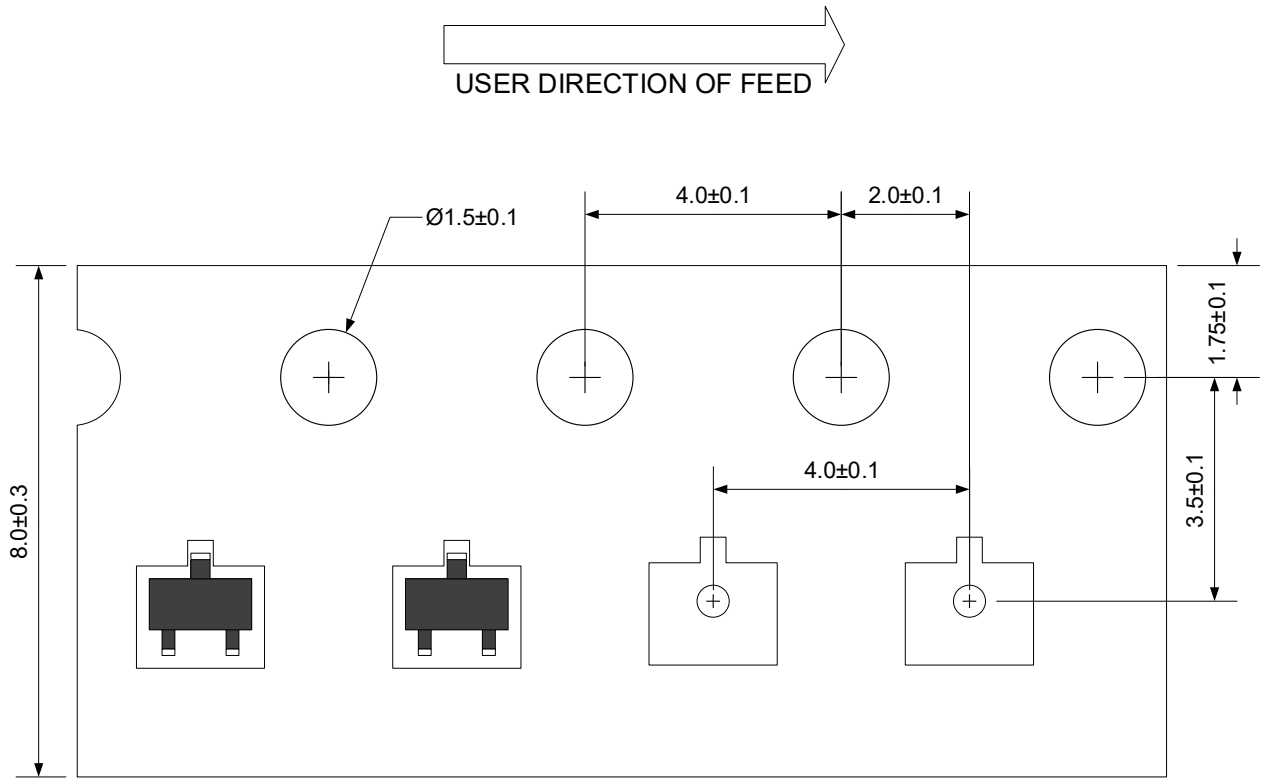
| Dim | Millimeters | | Inches | |
|-----|-------------|-------|------------|-------|
| | Min | Max | Min | Max |
| A | 0.700 | 0.900 | 0.028 | 0.035 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.700 | 0.800 | 0.028 | 0.031 |
| b1 | 0.150 | 0.250 | 0.006 | 0.010 |
| b2 | 0.250 | 0.350 | 0.010 | 0.014 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 0.700 | 0.900 | 0.028 | 0.035 |
| E1 | 1.450 | 1.750 | 0.057 | 0.069 |
| e | 0.500 Typ. | | 0.020 Typ. | |
| e1 | 0.900 | 1.100 | 0.035 | 0.043 |
| L | 0.400 Ref. | | 0.016 Ref. | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |



Unit:mm

Suggested PCB Layout

Load with information




Unit:mm

Ordering information

| Device | Package | Reel | Shipping |
|---------------|-------------------|------|--------------------|
| PPM523T30V02E | SOT-523 (Pb-Free) | 7" | 3000 / Tape & Reel |


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