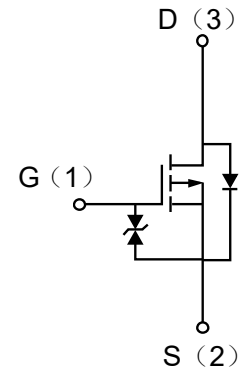


## Description

The enhancement mode MOS is extremely high density cell and low on-resistance.

MOSFET Product Summary		
V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
-20	0.03 @ V <sub>GS</sub> =-4.5V	-6



## Absolute maximum rating@25°C

Rating	Symbol	Value	Units
Drain-Source Voltage	V <sub>DS</sub>	-20	V
Gate-Source Voltage	V <sub>GS</sub>	±10	V
Drain Current Continuous (Note 1)	I <sub>D</sub>	-6	A
Pulsed Drain Current (Note 2)	I <sub>DM</sub>	-30	A
Total Power Dissipation(Note 1)	P <sub>D</sub>	1.8	W
Avalanche Current(Note 3)	I <sub>AS</sub>	10.3	A
Avalanche Energy(Note 3)	E <sub>AS</sub>	26.7	mJ
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

## Thermal resistance

Parameter	Symbol	Typ.	Units
Maximum Junction-to-Ambient (Note 1)	R <sub>θJA</sub>	70	°C/W

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D = -250\mu A, V_{GS} = 0V$	-20	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -20V, V_{GS} = 0V$	-	-	-1.0	$\mu A$
Gate-to-Source Forward Leakage	$I_{GSS}$	$V_{GS} = \pm 10V, V_{DS} = 0V$	-	-	$\pm 10$	$\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.65	-1.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = -4.5V, I_D = -4A$	-	0.03	0.043	$\Omega$
		$V_{GS} = -2.5V, I_D = -4A$	-	0.038	0.06	$\Omega$
Forward Trans conductance	$g_{FS}$	$V_{DS} = -5V, I_D = -4A$	8	-	-	S
Total Gate Charge	$Q_g$	$I_D = -4A, V_{DS} = -10V, V_{GS} = -4.5V$	-	17	-	nC
Gate-to-Source Charge	$Q_{gs}$		-	1.2	-	
Gate-to-Drain(Miller) Charge	$Q_{gd}$		-	4.3	-	
Input Capacitance	$C_{ISS}$	$V_{GS} = 0V, V_{DS} = -10V, f = 1MHz$	-	1150	-	pF
Output Capacitance	$C_{OSS}$		-	120	-	pF
Reverse Transfer Capacitance	$C_{RSS}$		-	85	-	pF
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10V, V_{GS} = -4.5V, R_L = 2.5\Omega, R_{GEN} = 3\Omega$	-	9.3	-	ns
Rise Time	$t_r$		-	15	-	
Turn-Off Delay Time	$t_{d(off)}$		-	80	-	
Fall Time	$t_f$		-	25	-	
Diode Forward Voltage (Note 4)	$V_{SD}$	$V_{GS} = 0V, I_S = -1A$	-	-	-1.2	V
Diode Forward Current (Note 5)	$I_S$		-	-	-2.2	A

Note:

1. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout,  $R_{don(Tj,max)} = 50m\Omega$ . The value in any given application depends on the user's specific board design. The maximum current rating is package limited.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. This single-pulse measurement was taken under the following condition [L=500uH,  $V_{GS} = -10V, V_{DS} = -20V$ ]while it's value is limited by  $T_{j,Max} = 150^\circ C$
4. Pulse Test Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
5. Surface Mounted on FR4 Board,  $t \leq 10sec$ .

Typical Characteristics

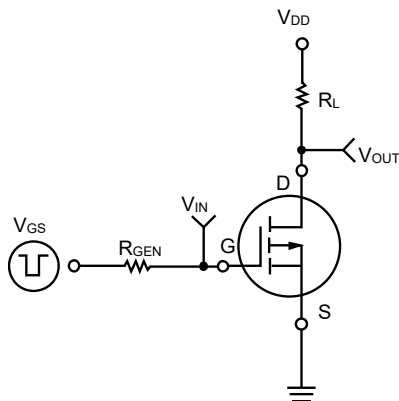


Figure 1. Switching Test Circuit

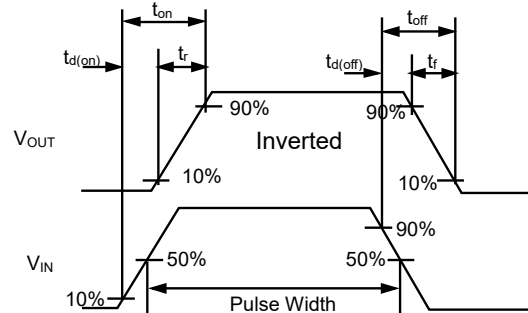


Figure 2. Switching Waveforms

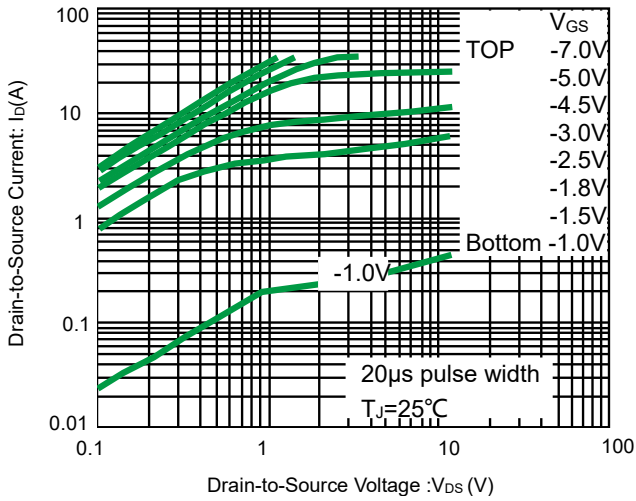


Fig 3. Typical output characteristics

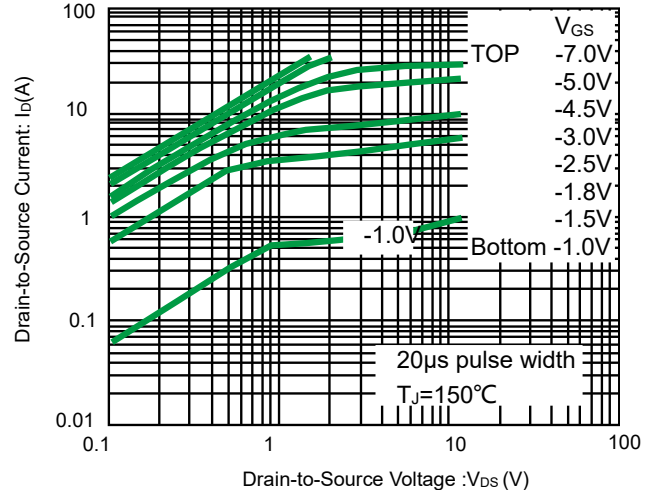


Fig 4. Typical output characteristics

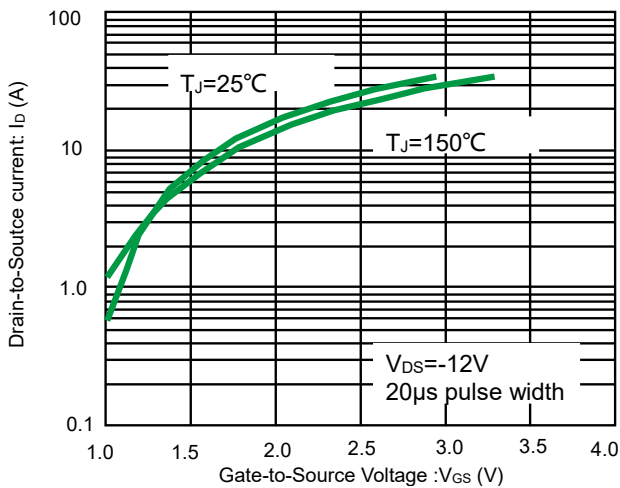


Fig 5. Typical transfer characteristics

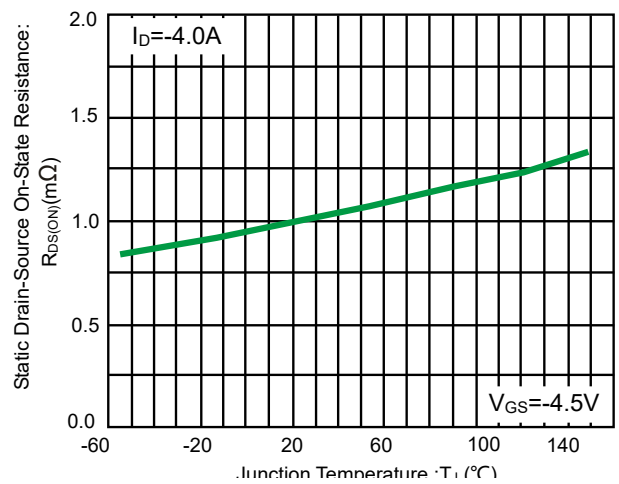


Fig 6. Normalized On-Resistance vs, Temperature

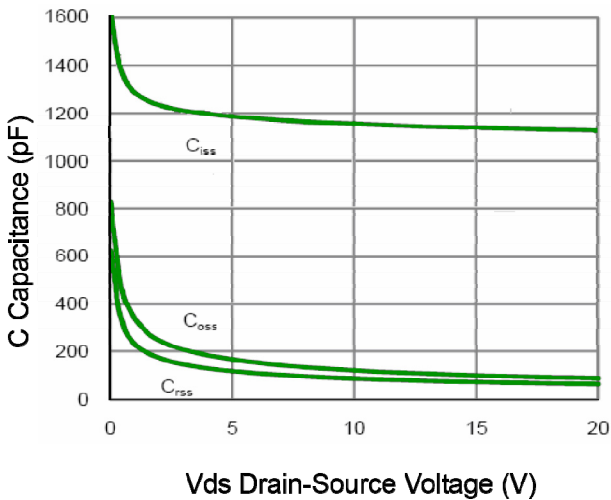


Fig 7. Typical Capacitance vs. Drain-to-Source voltage

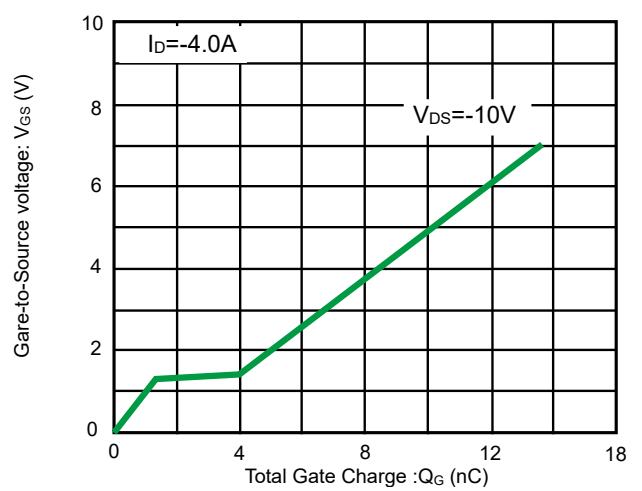


Fig 8. Typical Gate Charge vs. Gate-to-Source voltage

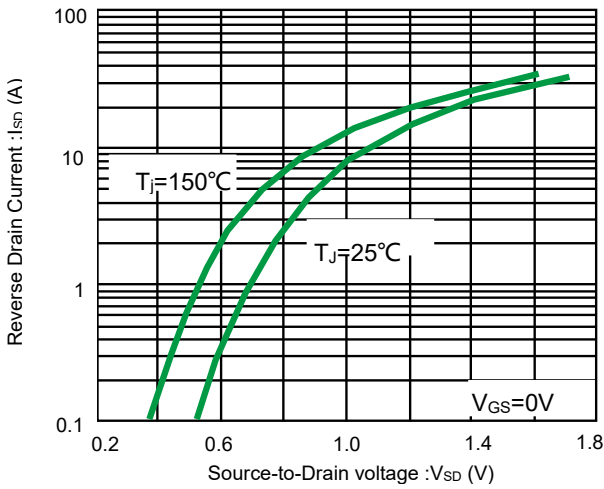


Fig 9. Typical Source-Drain Diode Forward Voltage

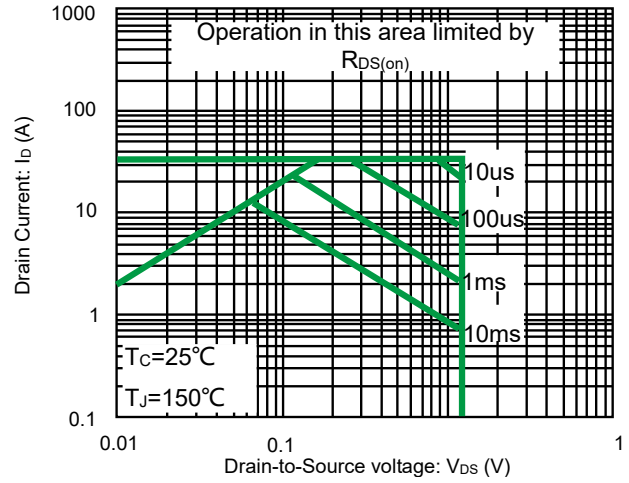


Fig 10. Maximum Safe Operating Area

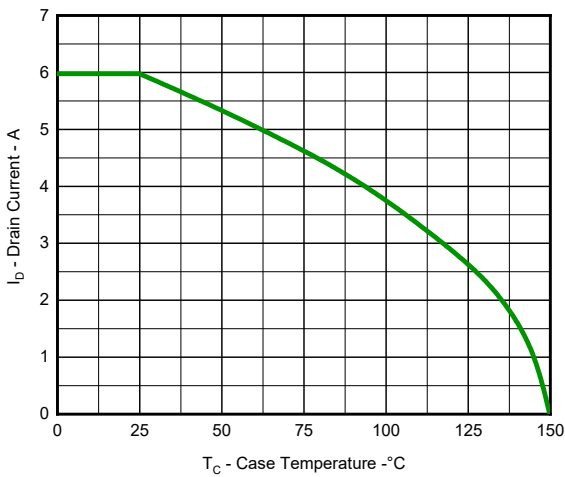


Fig 11. Maximum Drain Current vs. Case Temperature

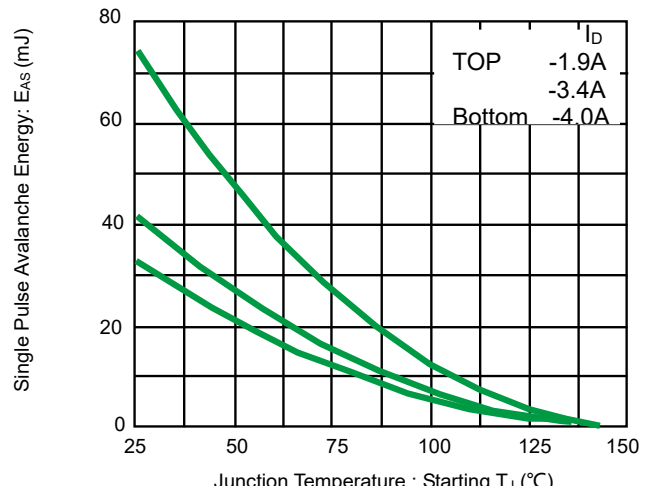


Fig 12. Maximum Avalanche Energy vs. Drain Current

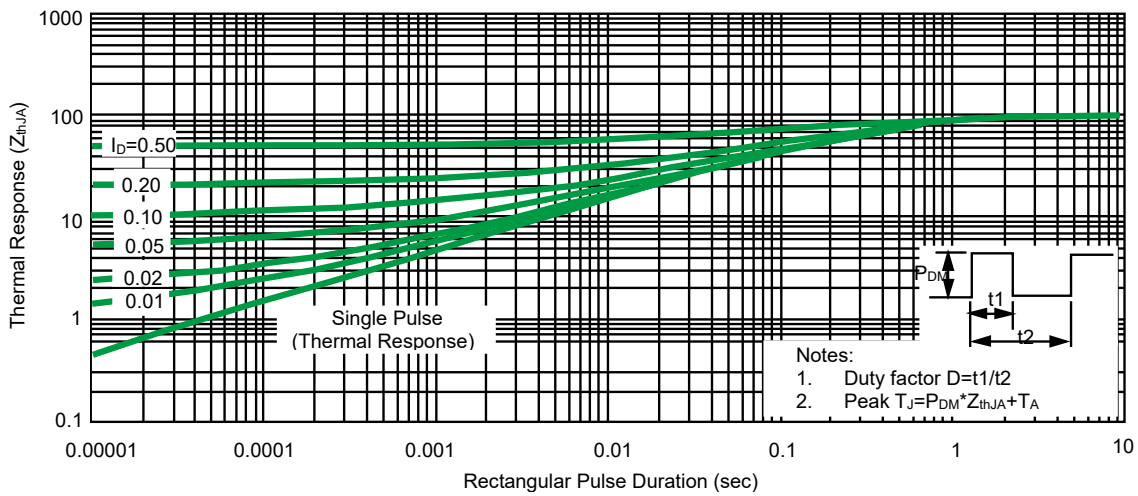


Fig 13. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

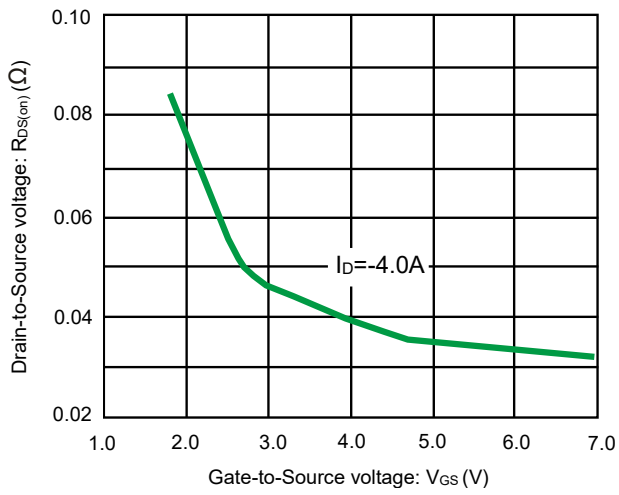


Fig 14. Typical On-Resistance vs. Gate Voltage

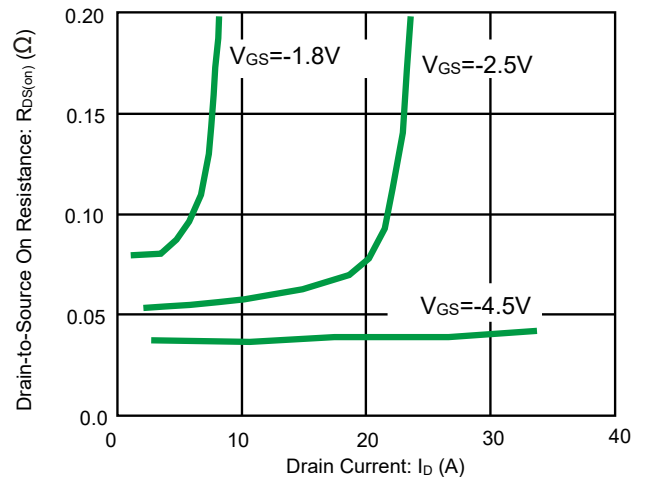


Fig 15. Typical On-Resistance vs. Drain Current

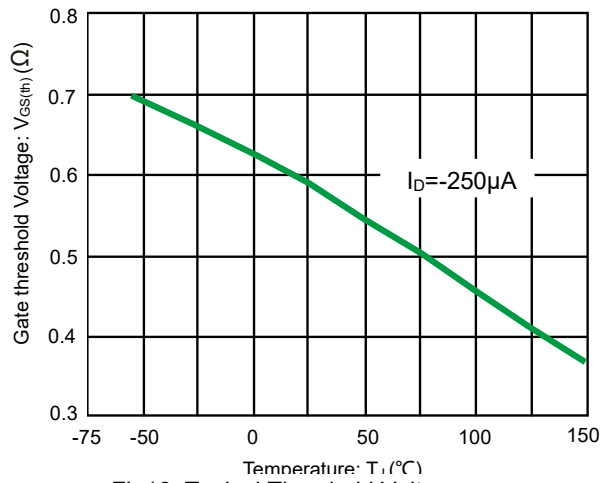
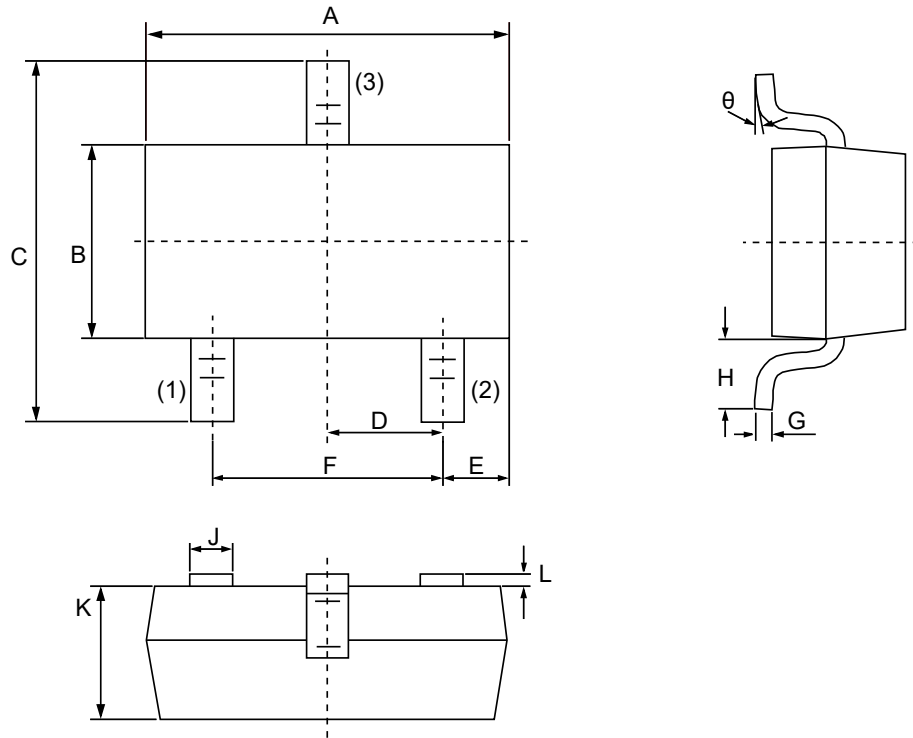
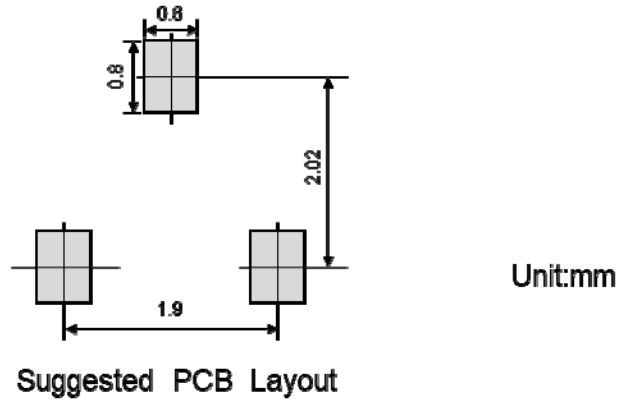


Fig16. Typical Threshold Voltage vs. Junction Temperature

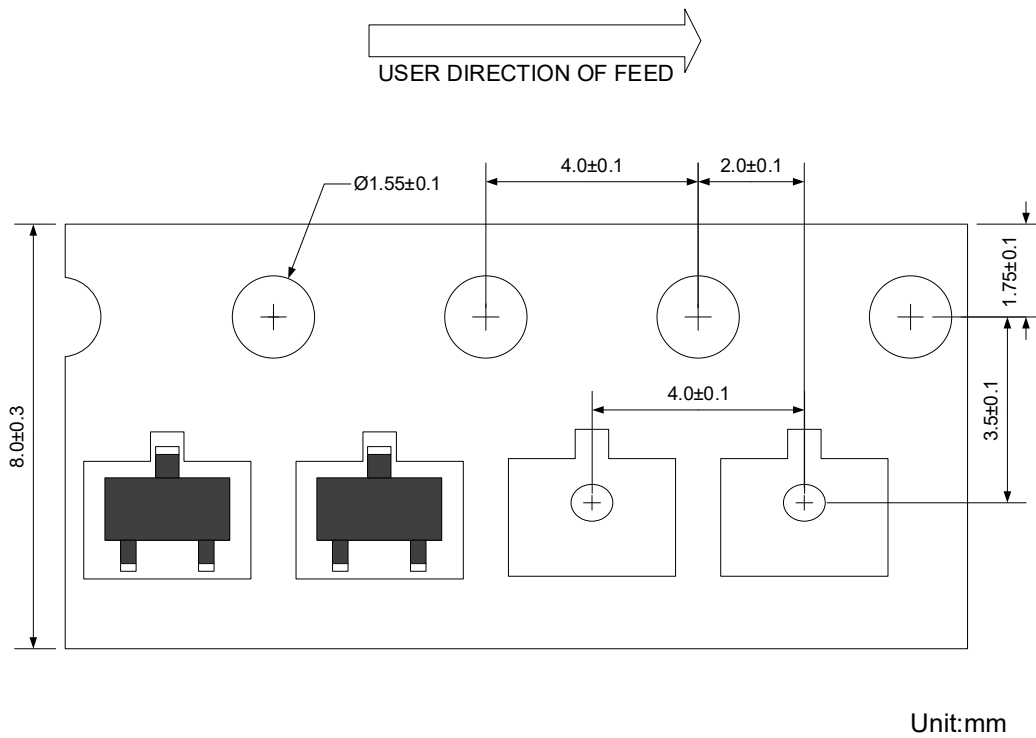
Product dimension(SOT-23)



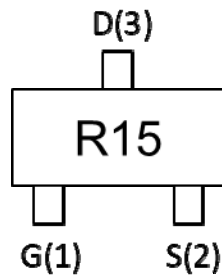
Dim	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	2.80	3.00	0.1102	0.1197
B	1.20	1.40	0.0472	0.0551
C	2.10	2.50	0.0830	0.0984
D	0.89	1.02	0.0350	0.0401
E	0.45	0.60	0.0177	0.0236
F	1.78	2.04	0.0701	0.0807
G	0.085	0.177	0.0034	0.0070
H	0.45	0.60	0.0180	0.0236
J	0.37	0.50	0.0150	0.0200
K	0.89	1.11	0.0350	0.0440
L	0.013	0.100	0.0005	0.0040
$\theta$	0°	10°	0°	10°



**Load with information**



**Marking information**



**Ordering information**

Device	Package	Reel	Shipping
PPMT3415R	SOT-23	7"	3000 / Tape & Reel