



Features

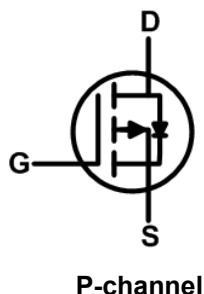
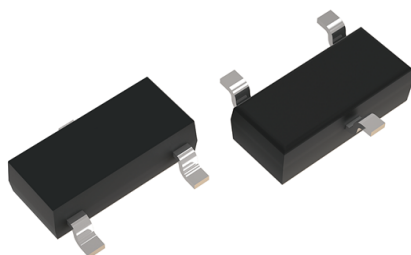
- Good stability and uniformity
- 100% avalanche tested
- Excellent package for good heat dissipation

Product Summary

VDS	-30	V
RDS(on), typ. @ VGS=-4.5 V	21	mΩ
ID	-9	A

Applications

- PWM Applications
- Load Switch
- Power Management
- General purpose applications



Maximum Ratings (T_J=25°C unless otherwise noted)

Symbol	Parameter	Value	Units
V _{DS}	Drain-Source Voltage	-30	V
I _D	Drain Current - Continuous (TC= 25°C)	-9	A
	Drain Current - Continuous (TC= 100°C)	-6*	A
I _{DM}	Drain Current - Pulsed (Note 1)	-36*	A
V _{GS}	Gate-Source Voltage	± 20	V
E _{AS}	Single Pulsed Avalanche Energy (Note 2)	97	mJ
P _D	Power Dissipation (TC = 25°C)	2.1	W
T _j , T _{stg}	Operating and Storage Temperature Range	-55 to +150	°C

* Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	Value	Units
R _{θJA}	Thermal Resistance, Junction-to-Ambient	58.89	°C/W

Electrical Characteristics TC = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D =-250 μA	-30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -30V, V _{GS} = 0 V			-1	μA
I _{GSS}	Gate Leakage Current	V _{GS} = ±20 V, V _{DS} = 0 V			±100	nA
On Characteristics						
V _{GS(TH)}	Gate Threshold voltage	V _{DS} = V _{GS} , I _D = -250 uA	-1.0	-1.5	-2.0	V
R _{DS(On)}	Drain-Source on-state resistance	V _{GS} = -10V, I _D =-5 A		14.5	20	mΩ
		V _{GS} = -4.5 V, I _D =-3 A		21	28	mΩ
g _{FS}	Forward Transconductance	V _{DS} = -5 V, I _D =-15A (Note 3)	15	20		S
Dynamic Characteristics						
C _{iss}	Input capacitance	V _{DS} =-15V, V _{GS} =0V, F=1.0Mhz		1203		pF
C _{oss}	Output capacitance			143		pF
C _{rss}	Reverse transfer capacitance			132		pF
Switching Characteristics						
t _{d(on)}	Turn On Delay Time	V _{DS} =-15V, I _D =-15A, V _{GS} =-10V, R _G =10hm (Note 3, 4)		5.6		ns
t _r	Rising Time			28		ns
t _{d(off)}	Turn Off Delay Time			52		ns
t _f	Fall Time			13.6		ns
Q _g	Total Gate Charge	V _{DS} =-15V, I _D =-15A, V _{GS} =-10V (Note 3, 4)		42		nC
Q _{gs}	Gate-Source Charge			6.1		nC
Q _{gd}	Gate-Drain Charge			9.2		nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current				-9	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current				-36	A
V _{SD}	Diode Forward Voltage	V _{GS} = 0 V, I _S = -30 A		-0.8	-1.2	V
I _{rr}	Reverse recovery Current	I _S = -15A, V _{GS} = 0 V, dI _F /dt = 100A/us		-0.25		A
T _{rr}	Reverse recovery time			14		Ns
Q _{rr}	Reverse recovery charge			2.0		nC

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $L = 0.5\text{ mH}, V_{DD} = -15\text{ V}, R_G = 25\text{ }\Omega$, Starting $T_J = 25^\circ\text{C}$
3. $I_{SD} \leq -15\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$
4. Pulse Test : Pulse width $\leq 300\text{ }\mu\text{s}$, Duty cycle $\leq 2\%$
5. Essentially independent of operating temperature

Typical Performance Characteristics

Fig.1 Power Dissipation Derating Curve

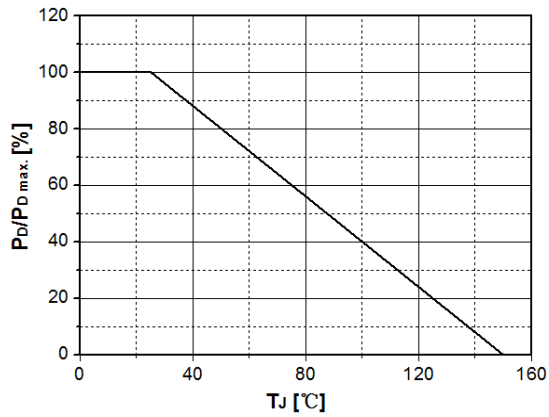


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

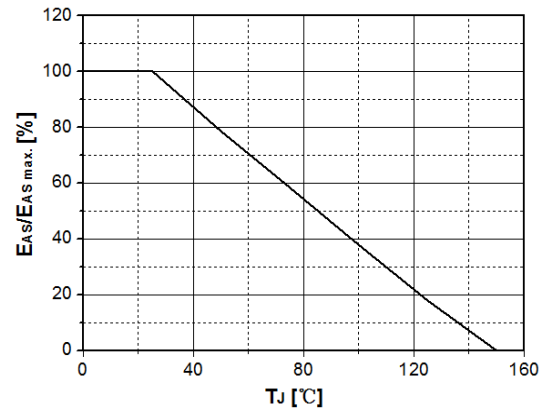


Fig.3 Typical Output Characteristics

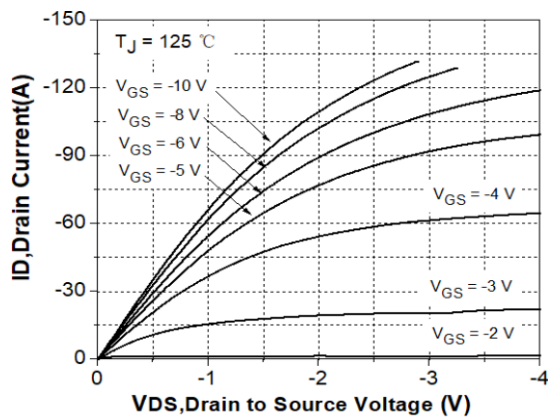


Fig. 4 Transconductance vs. Drain Current

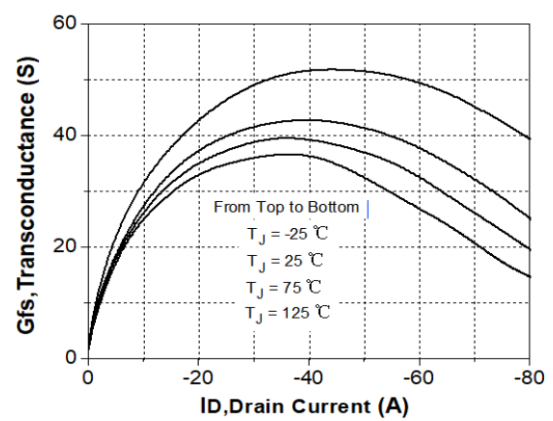


Fig.5 Typical Transfer Characteristics

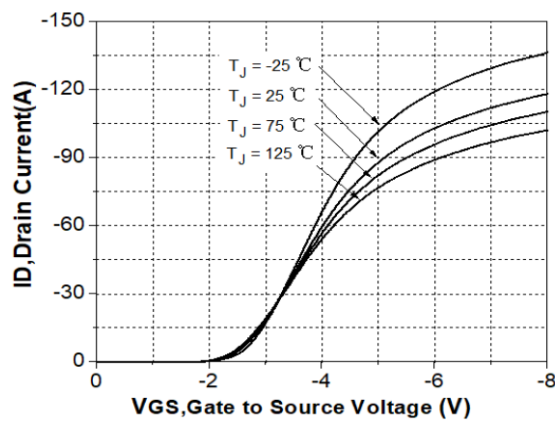


Fig.6 State Resistance vs. Drain Current

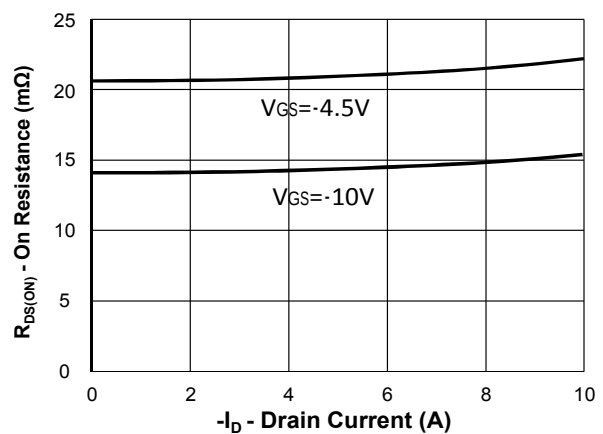


Fig.7 Typical Capacitance vs. Drain Source Voltage

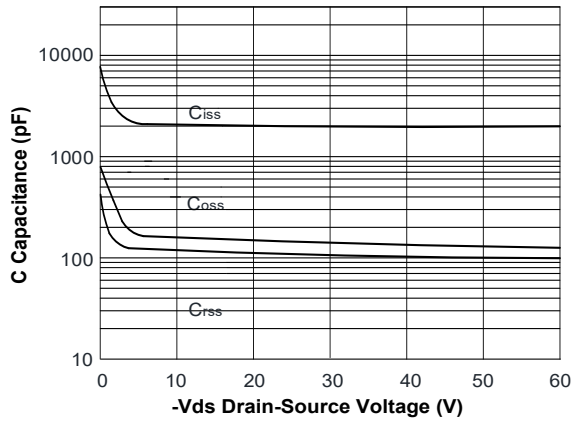


Fig.8 Dynamic Input Characteristics

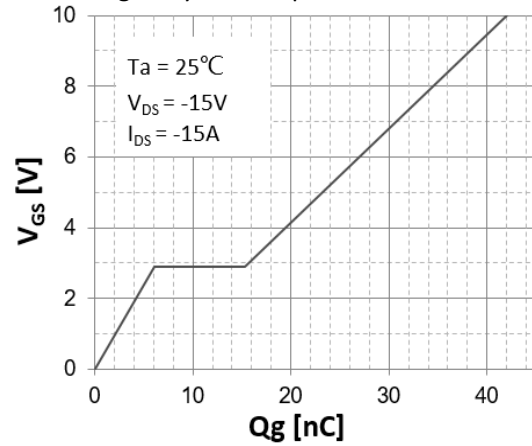


Fig.9 Breakdown Voltage vs. Junction Temperature

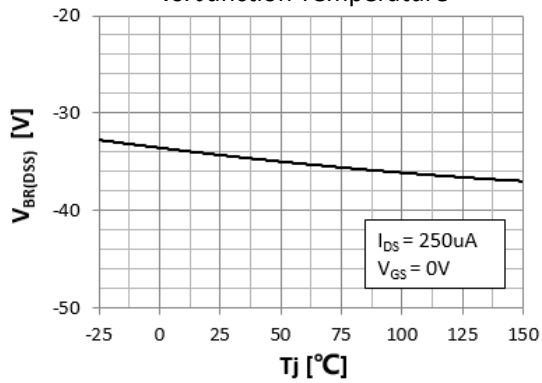


Fig. 10 Gate Threshold Voltage vs. Junction Temperature

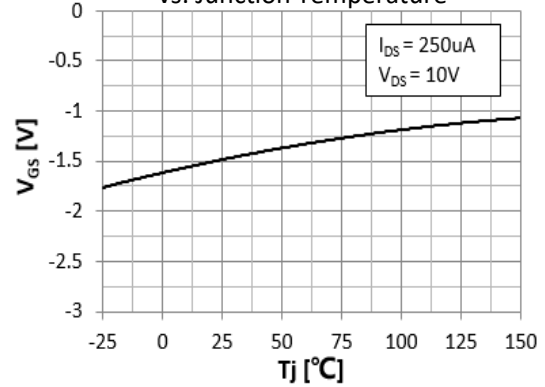


Fig.11 On-Resistance Variation vs. Junction Temperature

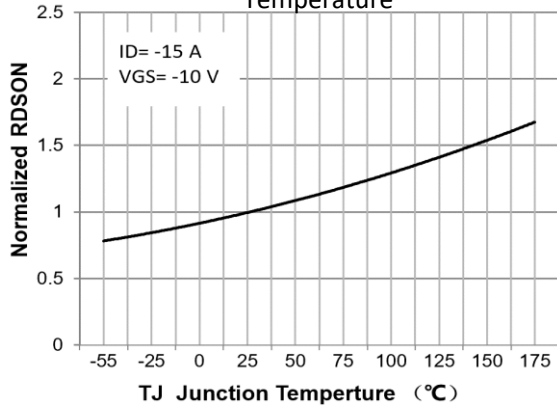


Fig.12 Maximum Drain Current vs. Case Temperature

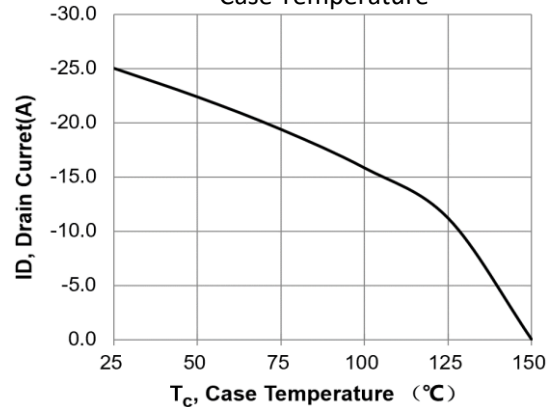


Fig.13 Body Diode Forward Voltage Vs Reverse Drain Current

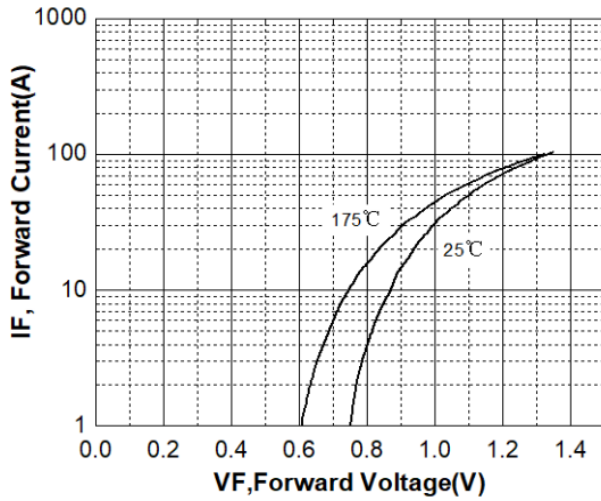


Fig.14 Safe Operating Area

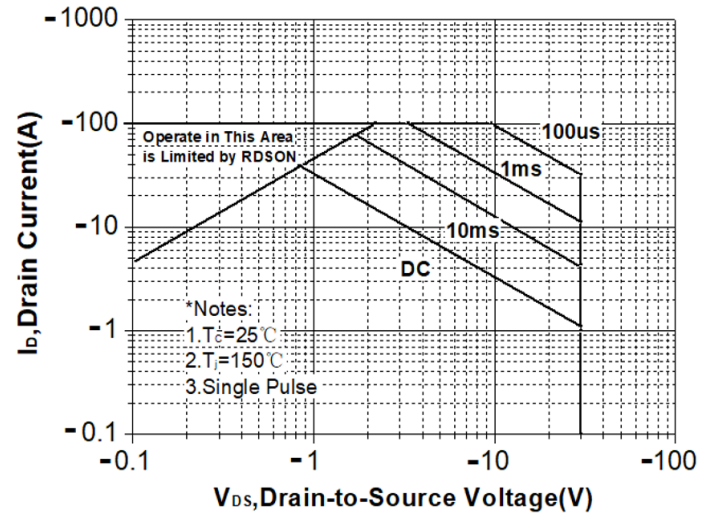
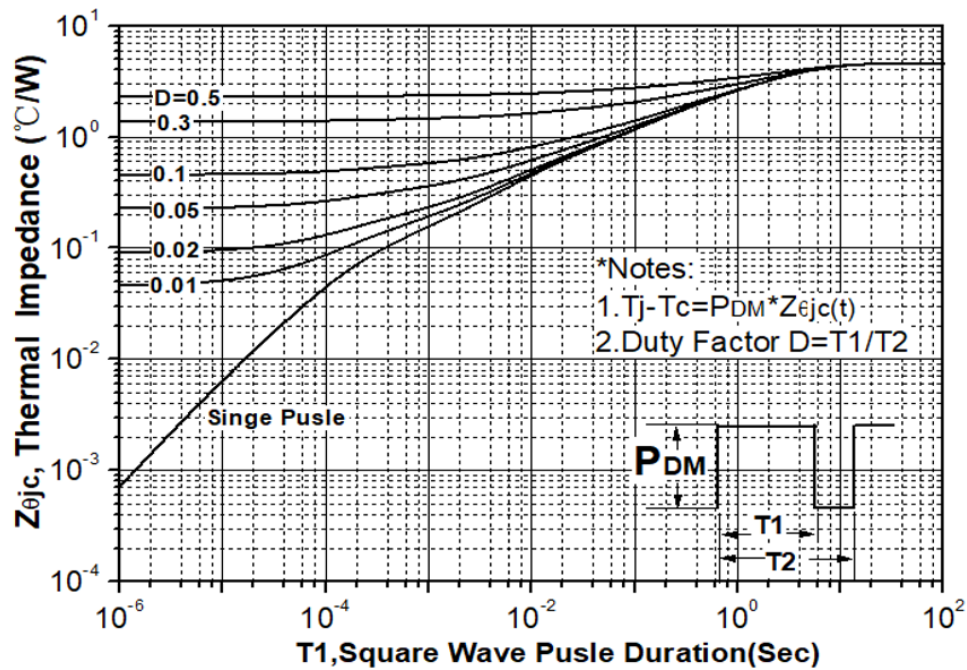
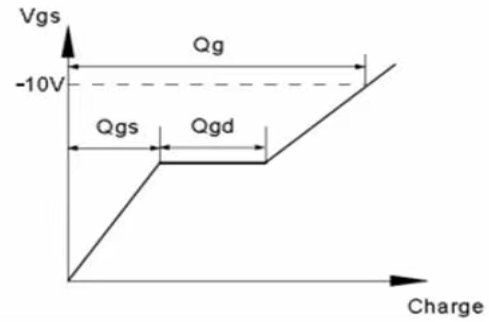
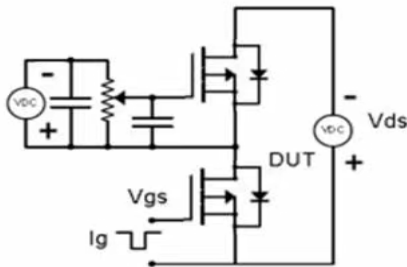


Fig. 15 Transient Thermal Response Curve

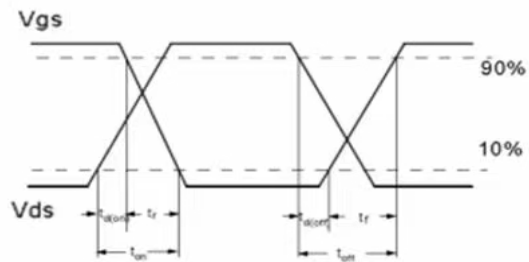
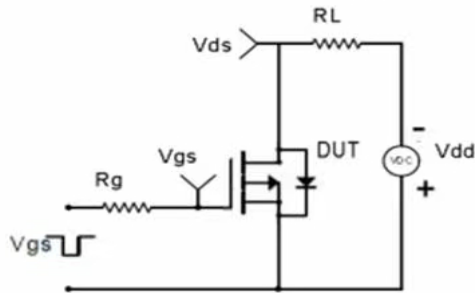


Test Circuit

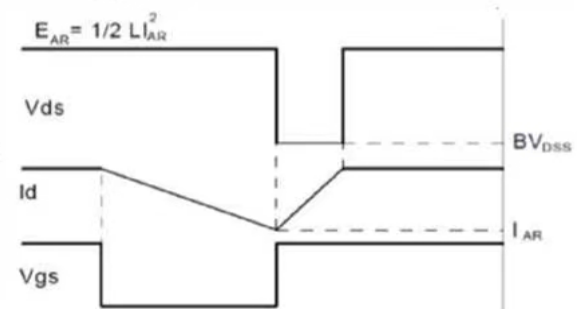
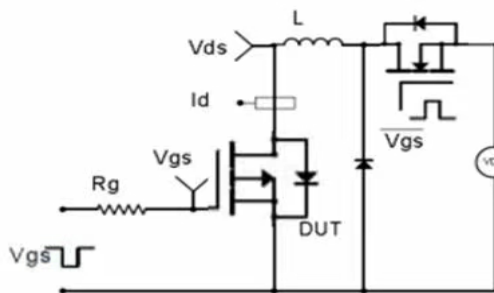
Gate Charge Test Circuit & Waveform



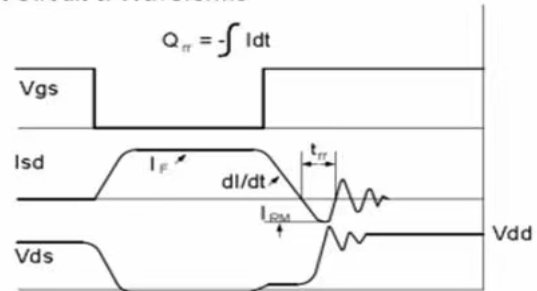
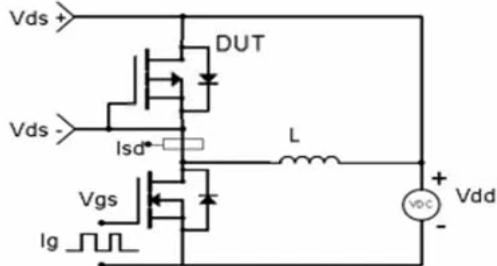
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

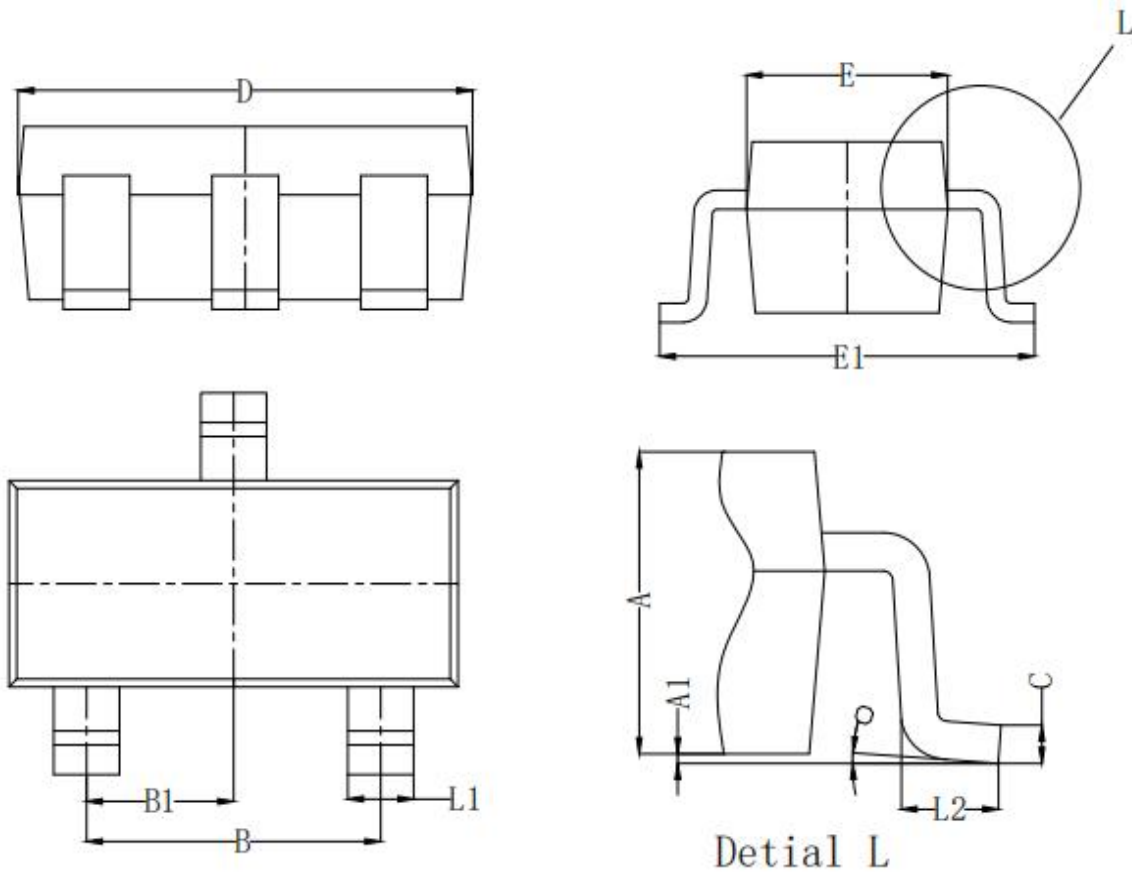


Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
JM3E30P09ZB-R	3007.	SOT23-3	Tape&Reel	3000/Reel

PACKAGE	MARKING
SOT23-3	3007. Lot Number

SOT-23-3L PACKAGE INFORMATION



Symbol	Dim in mm		
	最小值	中间值	最大值
A	1.050	1.100	1.150
A1	0.000	0.050	0.100
B	1.800	1.900	2.000
B1	0.950 TYP		
C	0.100	0.150	0.200
D	2.820	2.920	3.020
E	1.500	1.600	1.700
E1	2.650	2.800	2.950
L1	0.300	0.400	0.500
L2	0.300	0.450	0.600
o	0°	4°	8°

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