

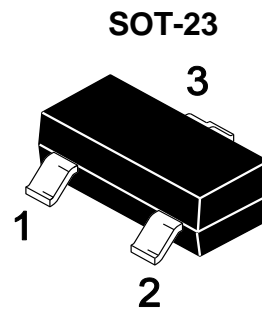


# PJM60H12MNSA

## N-Channel Depletion mode MOSFETS

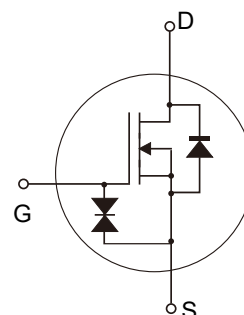
### Features

- ◆ Halogen and Antimony Free
- ◆ Depletion Mode
- ◆ ESD improved Capability



1.Gate 2.Source 3.Drain

**Marking: F501D**



### Absolute Maximum Ratings

( $T_C=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSX}$	600	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	0.03	A
Continuous Drain Current $T_C=70^{\circ}\text{C}$		0.024	
Pulsed Drain Current		$I_{DM}$	
Power Dissipation	$P_D$	0.5	W
Gate Source ESD (HBM-C=100pF, R=1.5k $\Omega$ )	$V_{ESD(G-S)}$	300	V
Junction Temperature	$T_J$	150	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to 150	$^{\circ}\text{C}$
<b>Thermal Characteristics</b>			
Parameter	Symbol	Typ.	Units
Maximum Junction-to-Ambient	$R_{\theta JA}$	250	$^{\circ}\text{C/W}$



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### Electrical Characteristics

(T<sub>C</sub>=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSX</sub>	V <sub>GS</sub> = -5V, I <sub>D</sub> = 250μA	600	-	-	V
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±10V	-	-	±100	nA
Off-state Drain to Source Current	I <sub>D(off)</sub>	V <sub>DS</sub> = 600V, V <sub>GS</sub> = -5V	-	-	0.1	μA
		V <sub>DS</sub> = 480V, V <sub>GS</sub> = -5V, T <sub>a</sub> = 125°C	-	-	10	μA
<b>ON Characteristics</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = 3V, I <sub>D</sub> = 8μA	-2.7	-1.8	-1	V
On-state drain current	I <sub>DSS</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 25V	12	-	-	mA
Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 3mA	-	350	700	Ω
		V <sub>GS</sub> = 10V, I <sub>D</sub> = 16mA	-	400	800	
<b>Dynamic Characteristics</b>						
Forward transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 50V, I <sub>D</sub> = 0.01A	8	17	-	mS
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = -5V, f = 1MHz	-	50	-	pF
Output Capacitance	C <sub>oss</sub>		-	4.53	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	1.08	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 300V, V <sub>GS</sub> = -5...7V R <sub>G</sub> = 6Ω, I <sub>D</sub> = 0.01A	-	9.9	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	55.8	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	56.4	-	
Turn-Off Fall Time	t <sub>f</sub>		-	136	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DD</sub> = 400V, V <sub>GS</sub> = -5V to 5V, I <sub>D</sub> = 0.01A	-	1.14	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	0.5	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	0.37	-	
<b>Drain-source Diode Characteristics</b>						
Diode Forward Current	I <sub>S</sub>	T <sub>a</sub> = 25°C	-	-	0.025	A
Pulse Diode Forward Current	I <sub>SM</sub>		-	-	0.1	A
Forward Diode Voltage	V <sub>SD</sub>	V <sub>GS</sub> = -5V, I <sub>F</sub> = 16mA	-	-	1.2	V
<b>Gate-source Zener diode</b>						
Gate-source breakdown voltage	V <sub>GSO</sub>	I <sub>GS</sub> = ±1mA (Open Drain)	20	-	-	V



Ratings And Characteristic Curves

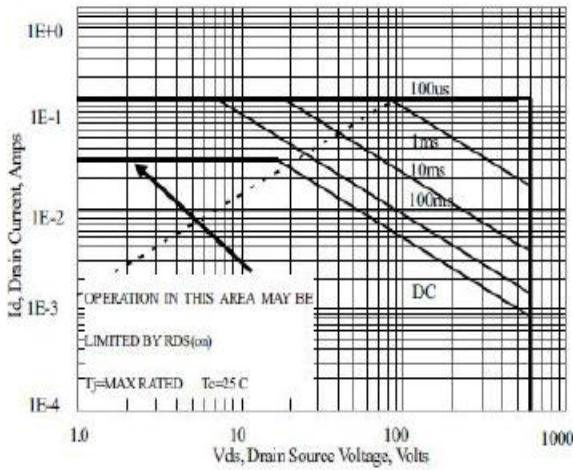


Figure 1 Maximum Forward Bias Safe Operating Area

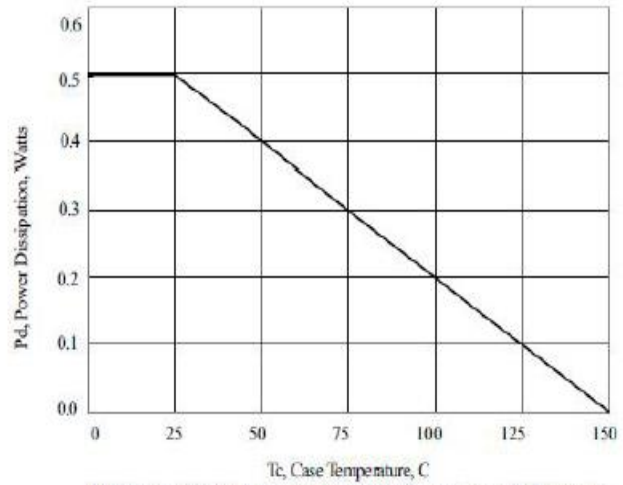


Figure 2 Maximum Power Dissipation vs Case Temperature

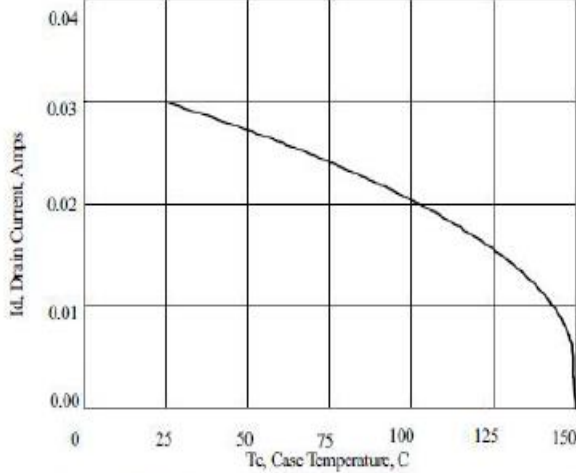


Figure 3 Maximum Continuous Drain Current vs Case Temperature

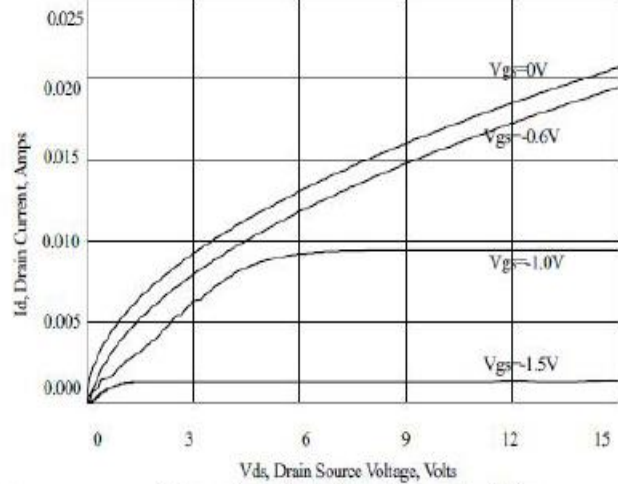


Figure 4 Typical Output Characteristics

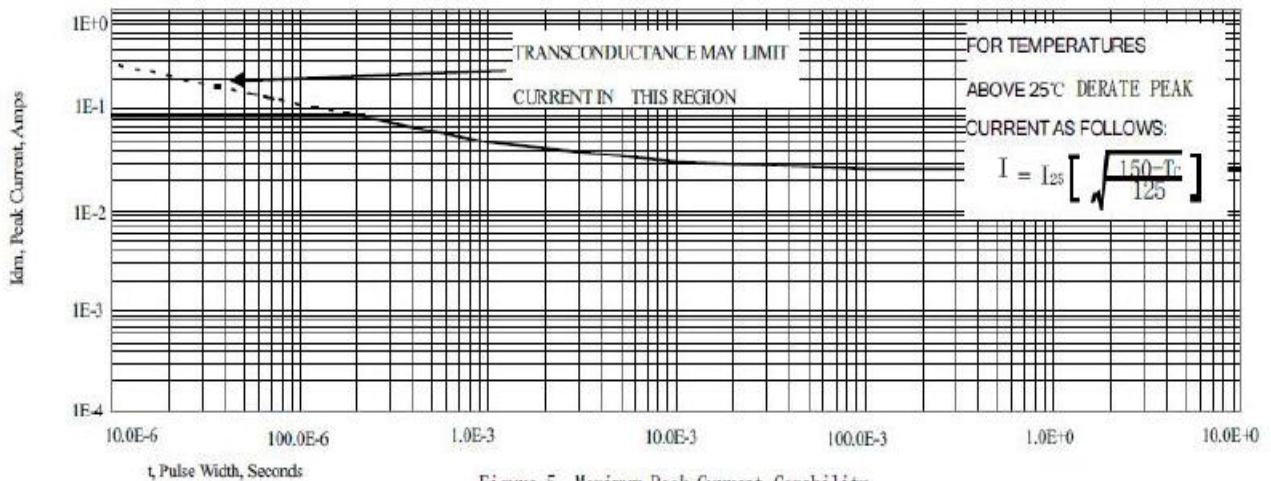


Figure 5 Maximum Peak Current Capability



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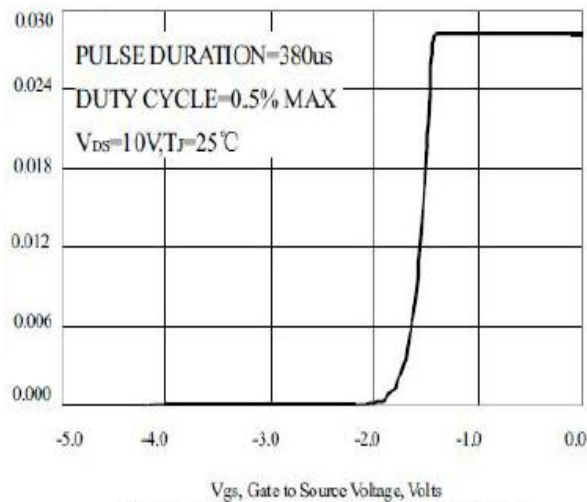


Figure 6 Typical Transfer Characteristics

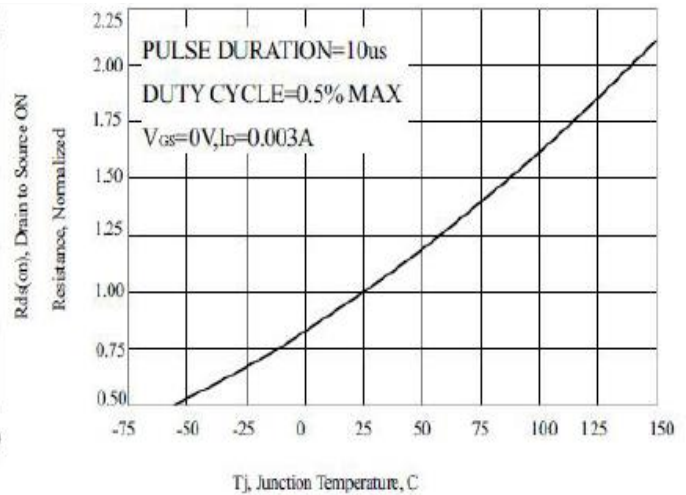


Figure 7 Typical Drain to Source ON Resistance vs Junction Temperature

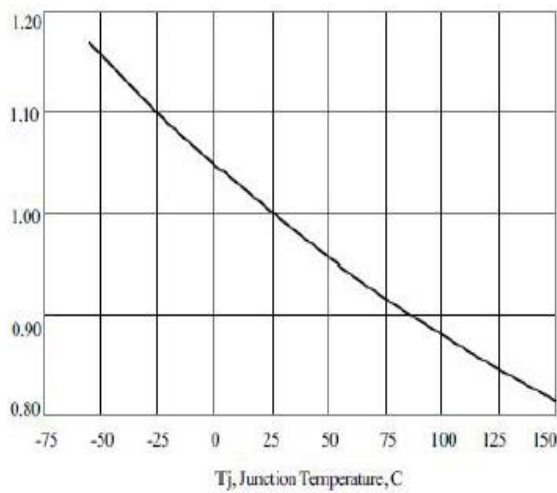


Figure 8 Typical Threshold Voltage vs Junction Temperature

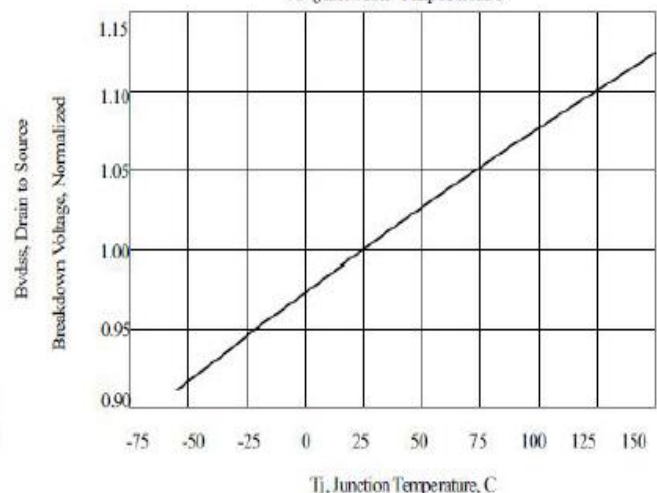


Figure 9 Typical Breakdown Voltage vs Junction Temperature

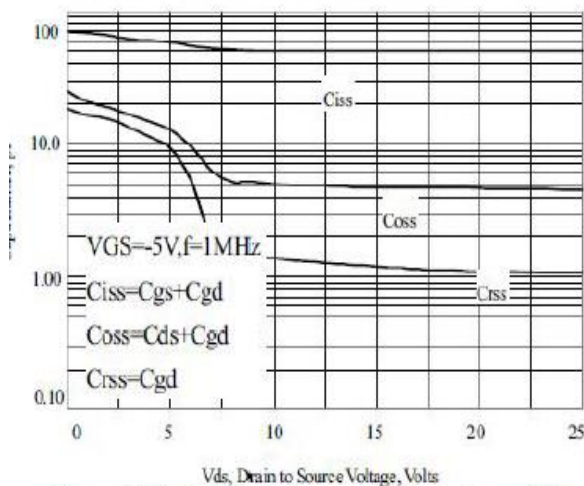


Figure 10 Typical Capacitance vs Drain to Source Voltage

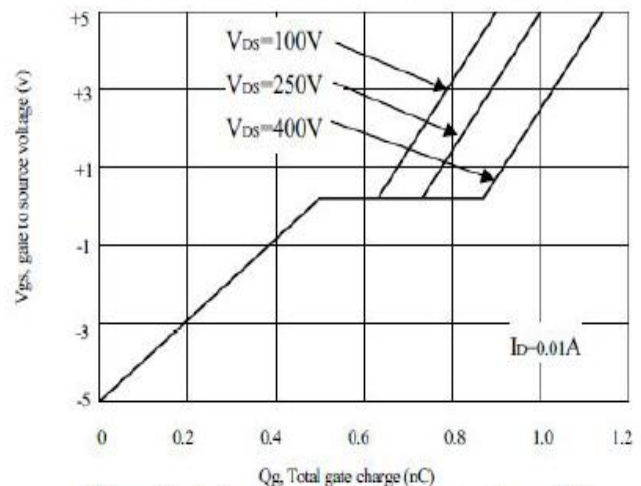


Figure 11 Typical Gate Charge vs Gate to Source Voltage



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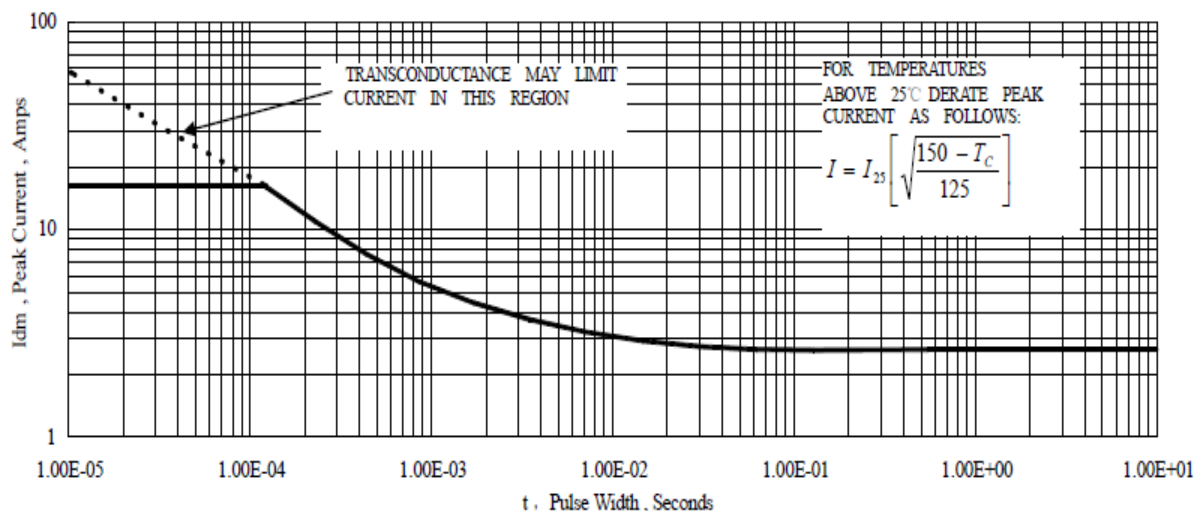


Figure 6 Maximum Peak Current Capability

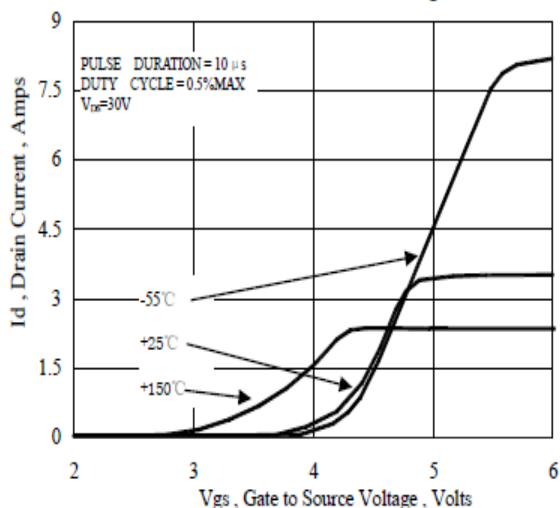


Figure 7 Typical Transfer Characteristics

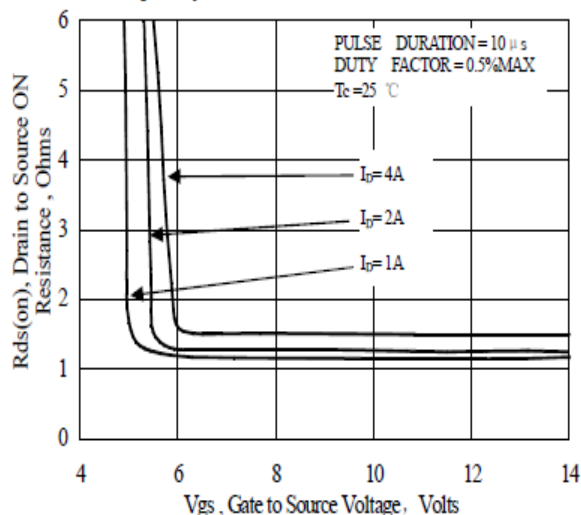


Figure 8 Typical Drain to Source ON Resistance vs Gate Voltage and Drain Current

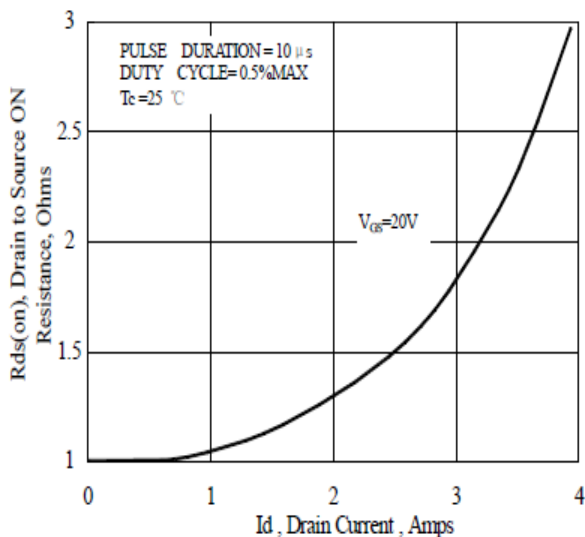


Figure 9 Typical Drain to Source ON Resistance vs Drain Current

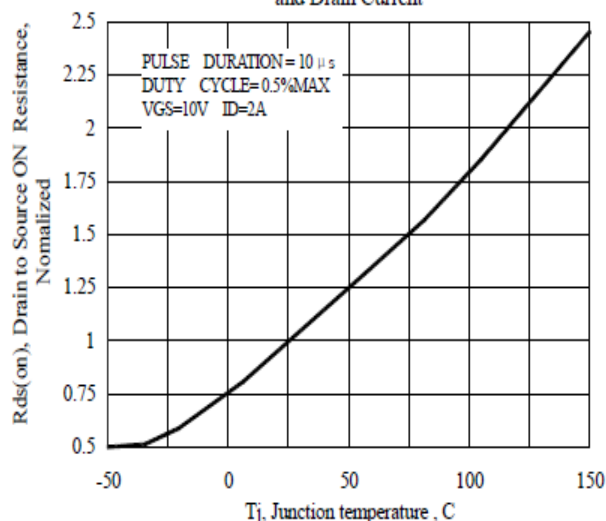


Figure 10 Typical Drain to Source on Resistance vs Junction Temperature

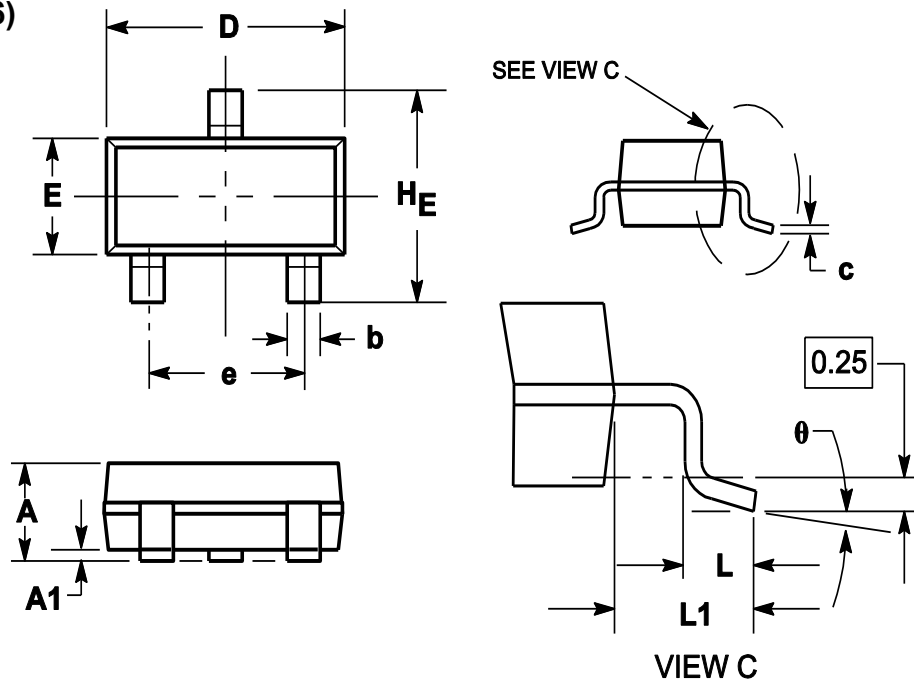


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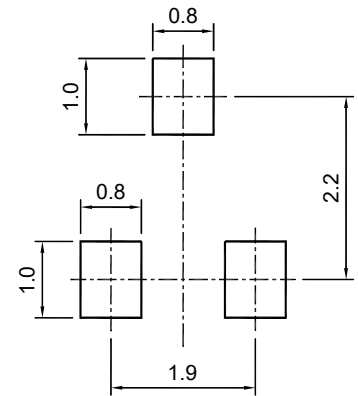
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### Package Outline

#### SOT-23 (TO-236)



Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.900	1.025	1.150
A1	0.000	0.050	0.100
b	0.300	0.400	0.500
c	0.080	0.115	0.150
D	2.800	2.900	3.000
E	1.200	1.300	1.400
HE	2.250	2.400	2.550
e	1.800	1.900	2.000
L1	0.550REF		
L	0.300		0.500
θ	0°		8°



SOT-23 (TO-236)

**Recommended soldering pad**

### Ordering Information

Device	Package	Shipping
PJM60H12MNSA	SOT-23	3000/Reel&Tape(7inch)