



PJM2301JPSA

P-Channel Enhancement Mode Power MOSFET

Product Summary

- $V_{DS} = -20V, I_D = -3.5A$
- $R_{DS(on)} < 56m\Omega @ V_{GS} = -4.5V$
- $R_{DS(on)} < 68m\Omega @ V_{GS} = -2.5V$

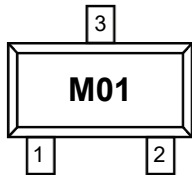
Features

- Advanced Trench Technology
- RoHS and Reach Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3
- Molding Compound Meets UL 94 V-0 Flammability Rating

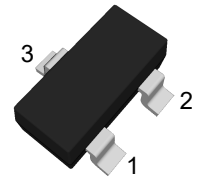
Application

- Load Switch
- PWM Applications
- Power Management

Marking Code



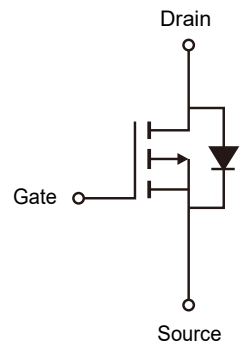
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(Top View)

Pin	Description
1	Gate
2	Source
3	Drain

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter		Symbol	Value	Unit
Drain-Source Voltage		$-V_{DS}$	20	V
Gate-Source Voltage		V_{GS}	± 12	V
Drain Current-Continuous	$T_A = 25^\circ C$	$-I_D$	3.5	A
	$T_A = 100^\circ C$		2.1	
Drain Current-Pulsed ^{Note1}		$-I_{DM}$	14	A
Maximum Power Dissipation		P_D	1.08	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Ambient ^{Note2}	$R_{\theta JA}$	116	°C/W
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Electrical Characteristics

(T_J=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	-V _{(BR)DSS}	V _{GS} =0V,I _D =-250μA	20	--	--	V
Zero Gate Voltage Drain Current	-I _{DSS}	V _{DS} =-20V,V _{GS} =0V	--	--	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V,V _{DS} =0V	--	--	±100	nA
Gate Threshold Voltage ^{Note3}	-V _{GS(th)}	V _{DS} =V _{GS} ,I _D =-250μA	0.4	0.65	1	V
Drain-Source On-Resistance ^{Note3}	R _{DS(on)}	V _{GS} =-4.5V,I _D =-2.8A	--	42	56	mΩ
		V _{GS} =-2.5V,I _D =-2A	--	52	68	mΩ
Forward Transconductance ^{Note3}	g _{FS}	V _{DS} =-5V,I _D =-1A	--	5.5	--	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-10V,V _{GS} =0V,f=1MHz	--	476	--	pF
Output Capacitance	C _{oss}		--	62	--	pF
Reverse Transfer Capacitance	C _{rss}		--	32	--	pF
Gate resistance	R _g	V _{GS} =0V,f=1MHz	--	107	--	Ω
Total Gate Charge	Q _g	V _{DS} =-10V,I _D =-2A, V _{GS} =-4.5V	--	12	--	nC
Gate-Source Charge	Q _{gs}		--	2.5	--	nC
Gate-Drain Charge	Q _{gd}		--	3	--	nC
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-10V, I _D =-2A, V _{GS} =-4.5V,R _{GEN} =3Ω	--	15	--	nS
Turn-on Rise Time	t _r		--	12	--	nS
Turn-off Delay Time	t _{d(off)}		--	30	--	nS
Turn-off Fall Time	t _f		--	15	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	-V _{SD}	V _{GS} =0V,I _S =-1.5A	--	--	1.2	V
Diode Forward Current ^{Note2}	-I _S		--	--	3.5	A
Reverse Recovery Time	trr	I _F =-2A,di/dt=100A/μS	--	25	--	nS
Reverse Recovery Charge	Qrr		--	12	--	nC

Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Surface mounted on 1inch² FR-4 board with 2OZ copper
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Test Circuit

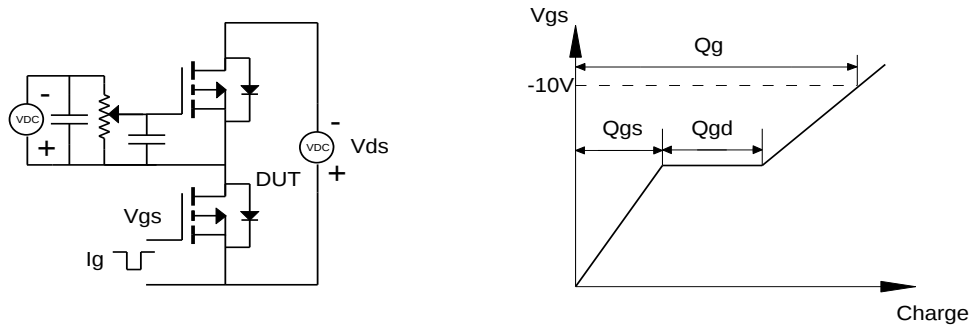


Figure 1: Gate Charge Test Circuit & Waveform

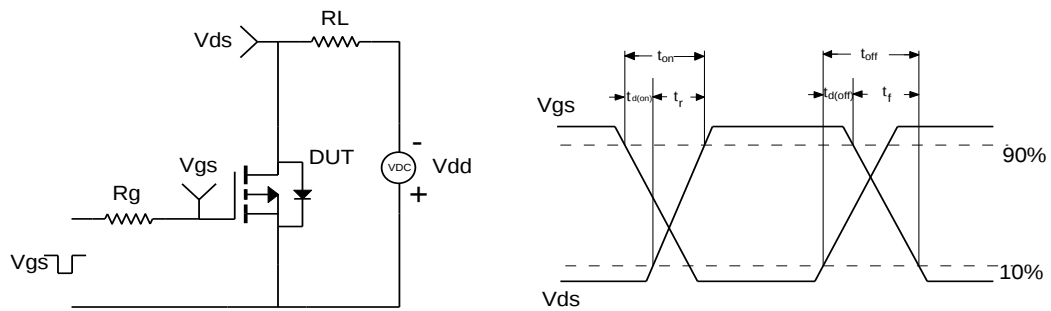


Figure 2: Resistive Switching Test Circuit & Waveform

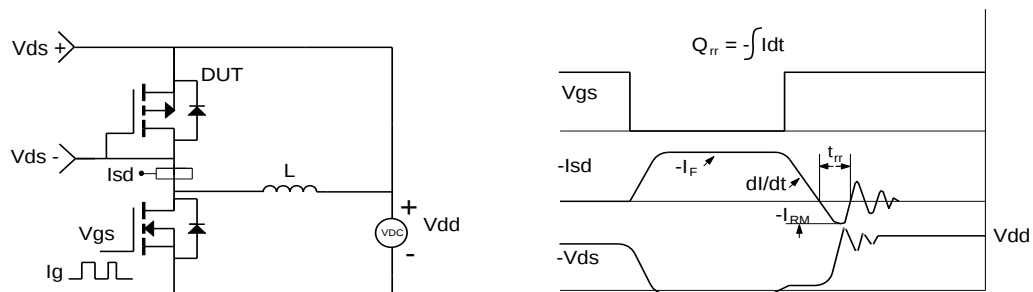


Figure 3: Diode Recovery Test Circuit & Waveform

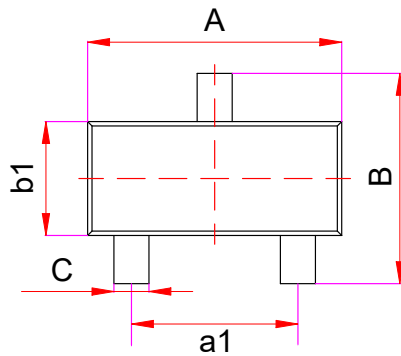


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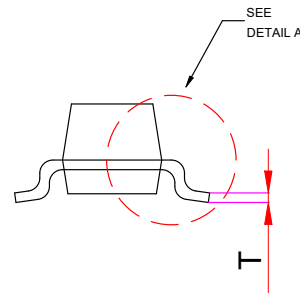
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Package Outline

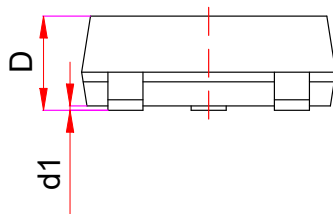
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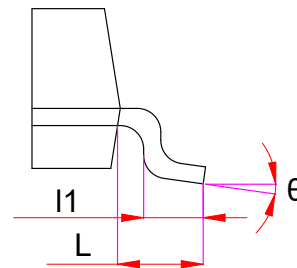
TOP VIEW



SIDE VIEW



SIDE VIEW

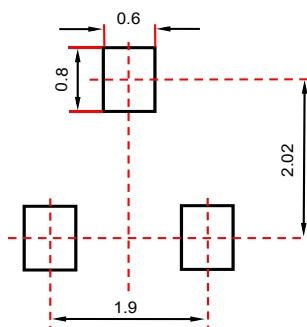


DETAIL A

Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	2.800	2.900	3.000	0.110	0.114	0.118
B	2.250	2.400	2.550	0.089	0.094	0.100
a1	1.800	1.900	2.000	0.071	0.075	0.079
b1	1.200	1.300	1.400	0.047	0.051	0.055
C	0.300	0.400	0.500	0.012	0.016	0.020
D	0.900	1.025	1.150	0.035	0.040	0.045
d1	0.000	0.050	0.100	0.000	0.002	0.004
L	0.550 REF			0.022 REF		
l1	0.300	-	0.500	0.012	-	0.020
T	0.080	0.115	0.150	0.003	0.005	0.006
θ	0°	-	8°	0°	-	8°

Suggested Pad Layout

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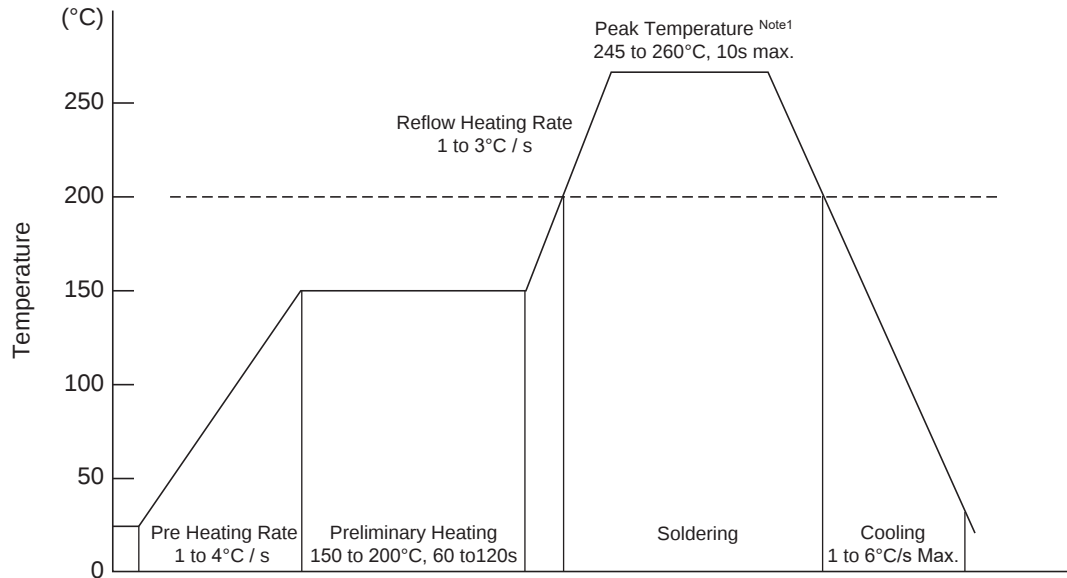
Note:

1. Package Body Sizes Exclude Mold Flash and Gate Burrs
2. Controlling Dimension: In millimeters
3. General Tolerance: $\pm 0.05\text{mm}$
4. The Pad Layout is for reference purposes only



Conditions of Soldering and Storage

◆ Recommended condition of Reflow Soldering(Pb-Free Solder)



Recommended peak temperature is over 245°C. If peak temperature is below 245°C, you may adjust the following parameters:

- Time length of peak temperature (longer)
- Time length of soldering (longer)
- Thickness of solder paste (thicker)

Note1:

Maximum thermal excursion allowed during the reflow assembly is as follow:

- Temperature: 255°C~260°C
- Duration at peak soak : 30 seconds
- Number of reflow: 3
- **Conditions of hand soldering** ^{Note2}

- Temperature: 320±10°C
- Time: 3s max.
- Times: one time

Note2: Not recommended for mass production, an engineering project, or re-work, it is allowed. It should be used with caution

● **Storage conditions**

● **Temperature**

5 to 30°C

● **Humidity**

≤ 60% RH

● **Floor Life**

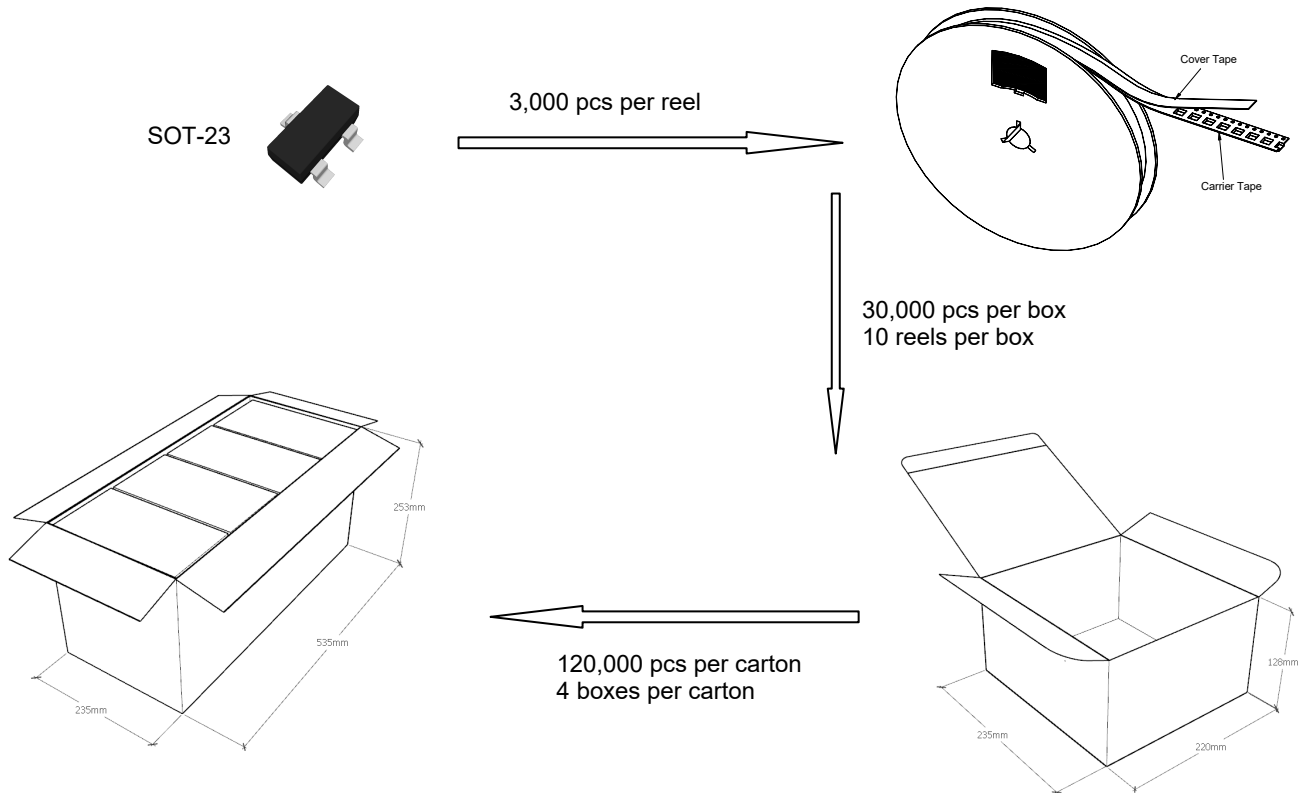
168 Hours

● **Recommended period**

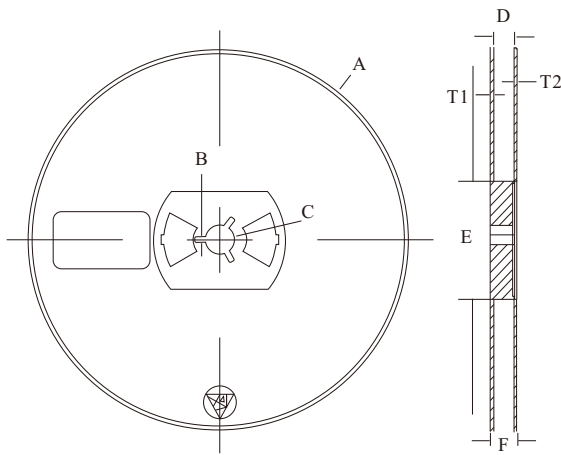
Five year after manufacturing(Depends on storage conditions)

Package Specifications

- The method of packaging



◆ Embossed tape and reel data



Reel (7")

Symbol	Value (unit: mm)
A	$\varnothing 177.8 \pm 1$
B	2.7 ± 0.2
C	$\varnothing 13.5 \pm 0.2$
E	$\varnothing 54.5 \pm 0.2$
F	12.3 ± 0.3
D	$9.6 +2/-0.3$
T1	1.0 ± 0.2
T2	1.2 ± 0.2

