



PJM09N20SC

N-Channel Enhancement Mode Power MOSFET

Product Summary

- $V_{DS} = 20V, I_D = 9A$
- $R_{DS(on)} < 13m\Omega @ V_{GS} = 4.5V$
- $R_{DS(on)} < 16m\Omega @ V_{GS} = 2.5V$

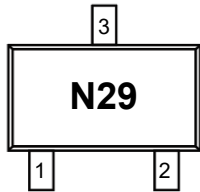
Features

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

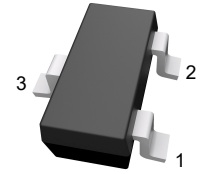
Application

- Load Switch
- PWM Applications
- Power Management

Marking Code



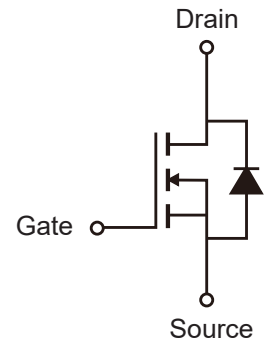
SOT-23-3



(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	9	A
	$T_A = 100^\circ C$		5.4	
Drain Current-Pulsed ^{Note1}		I_{DM}	36	A
Maximum Power Dissipation		P_D	1.6	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ C$

Thermal Characteristics

Thermal Resistance, Junction-to-Ambient ^{Note2}	$R_{\theta JA}$	78	$^\circ C/W$
--	-----------------	----	--------------



PJM09N20SC

N-Channel Enhancement Mode Power MOSFET

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	0.7	1.2	V
Drain-Source On-Resistance ^{Note3}	R _{DS(on)}	V _{GS} =4.5V, I _D =8A	--	9.8	13	mΩ
		V _{GS} =2.5V, I _D =6A	--	12	16	mΩ
Forward Transconductance ^{Note3}	g _{FS}	V _{DS} =5V, I _D =1A	--	7.5	--	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHz	--	1260	--	pF
Output Capacitance	C _{oss}		--	237	--	pF
Reverse Transfer Capacitance	C _{rss}		--	213	--	pF
Gate resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1MHz	--	1.9	--	Ω
Total Gate Charge	Q _g	V _{DS} =10V, I _D =4A, V _{GS} =4.5V	--	16	--	nC
Gate-Source Charge	Q _{gs}		--	3	--	nC
Gate-Drain Charge	Q _{gd}		--	5.5	--	nC
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =10V, I _D =4A, V _{GS} =4.5V, R _{GEN} =3Ω	--	10	--	nS
Turn-on Rise Time	t _r		--	30	--	nS
Turn-off Delay Time	t _{d(off)}		--	40	--	nS
Turn-off Fall Time	t _f		--	16	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	V _{SD}	V _{GS} =0V, I _S =5A	--	--	1.2	V
Diode Forward Current	I _S		--	--	9	A
Reverse Recovery Time	trr	I _F =5A, di/dt=100A/μS	--	7.5	--	nS
Reverse Recovery Charge	Qrr		--	1.6	--	nC

Note:

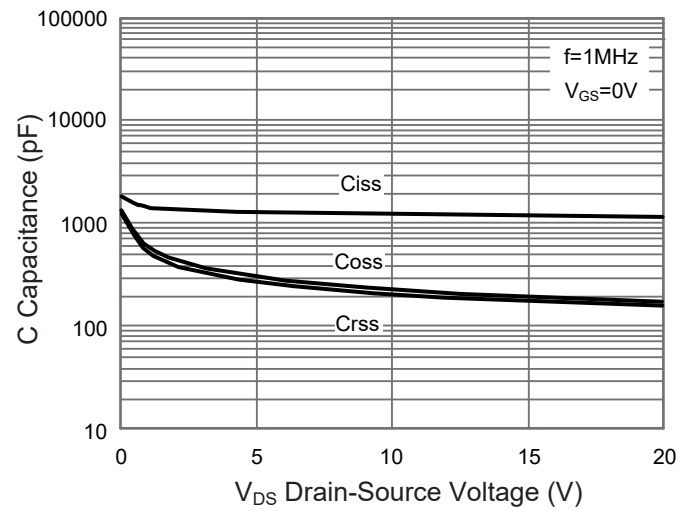
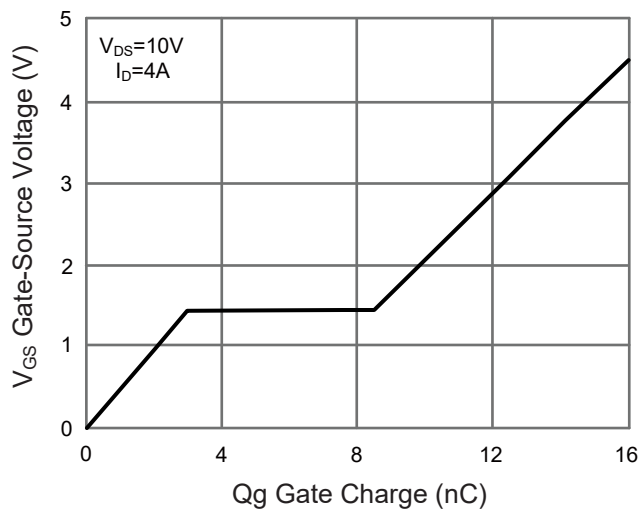
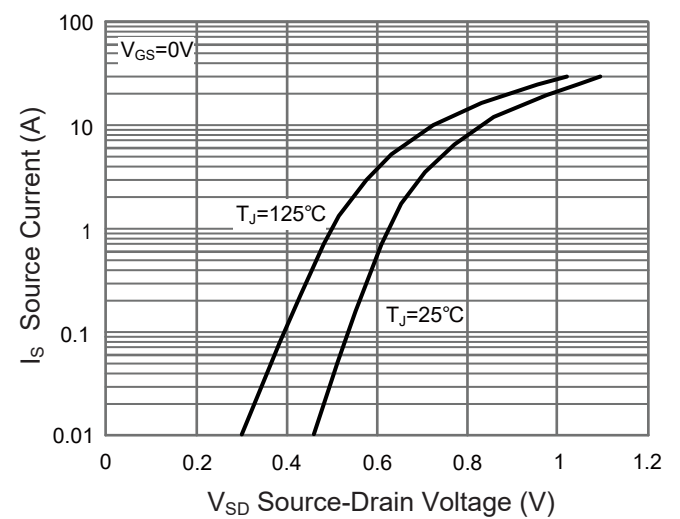
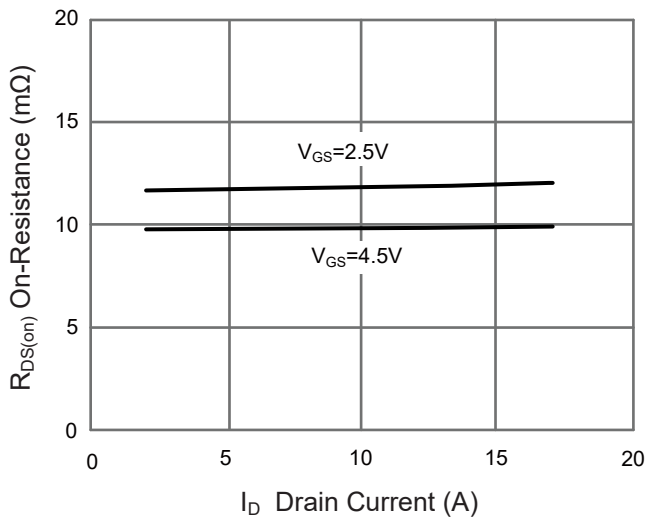
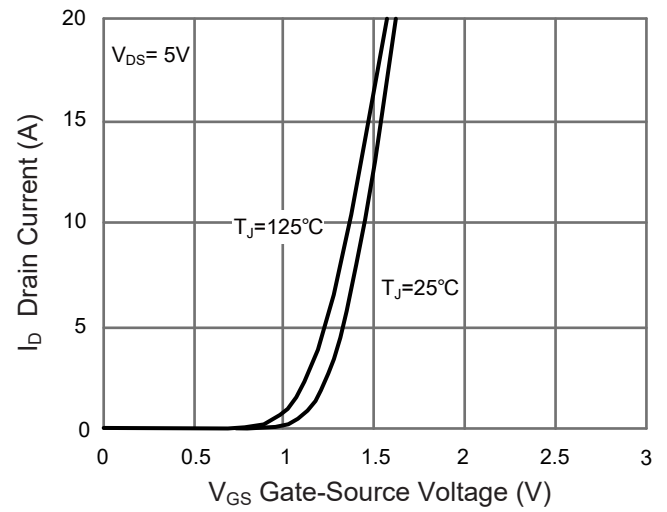
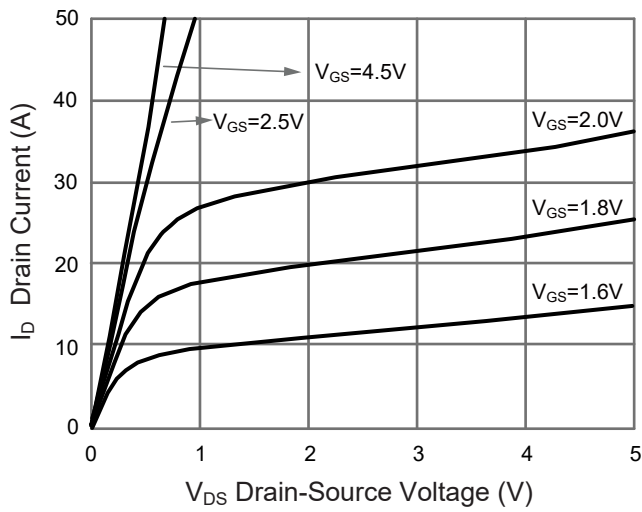
1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Surface mounted on 1inch² FR-4 board with 2OZ copper
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



PJM09N20SC

N-Channel Enhancement Mode Power MOSFET

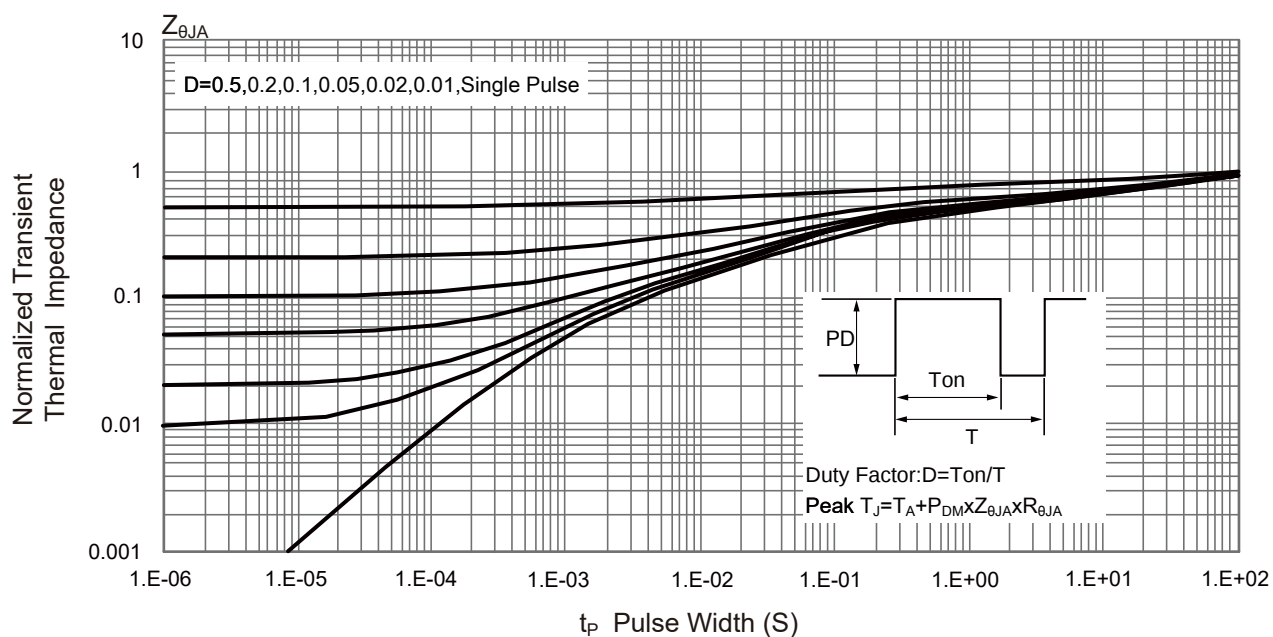
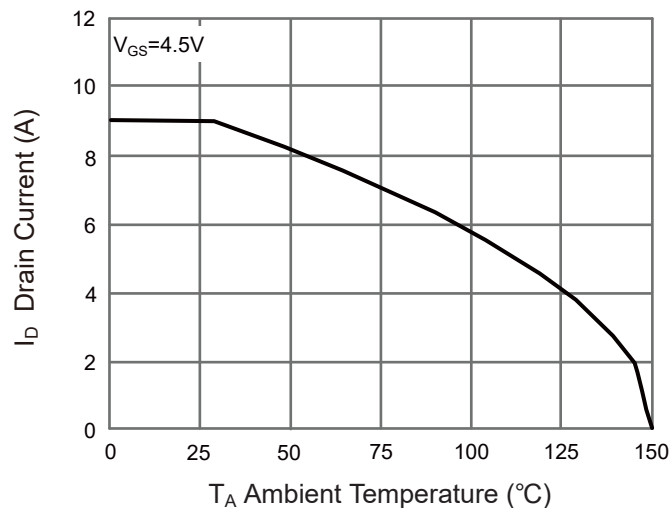
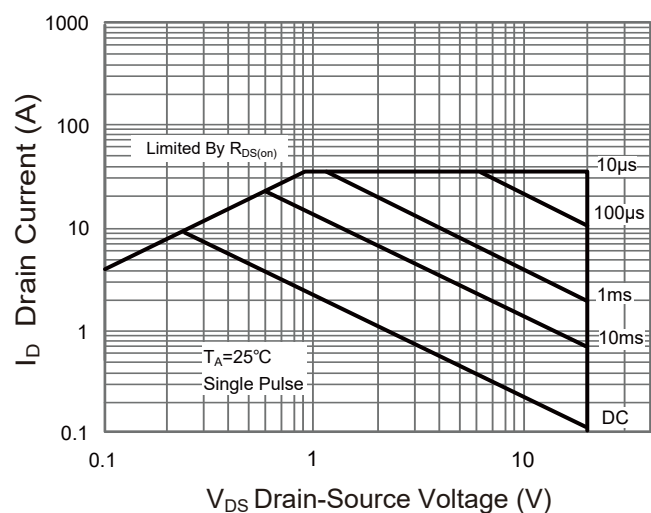
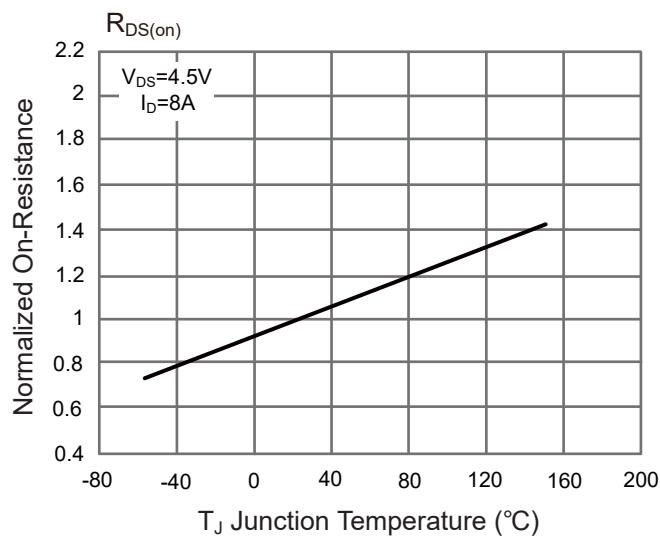
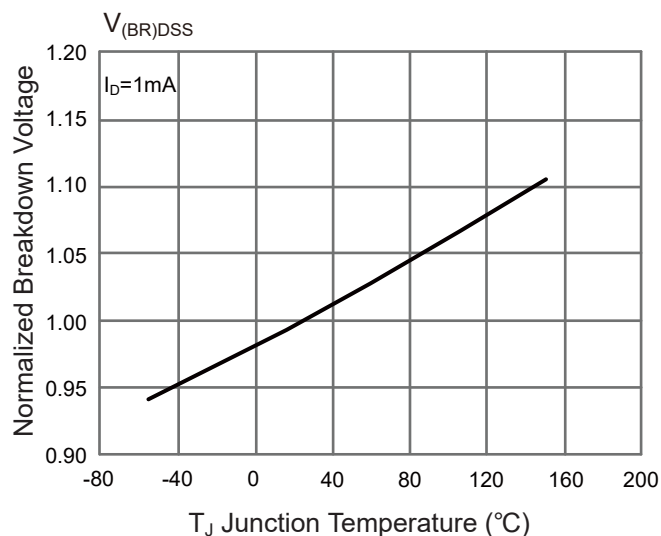
Typical Characteristic Curves





PJM09N20SC

N-Channel Enhancement Mode Power MOSFET



Test Circuit

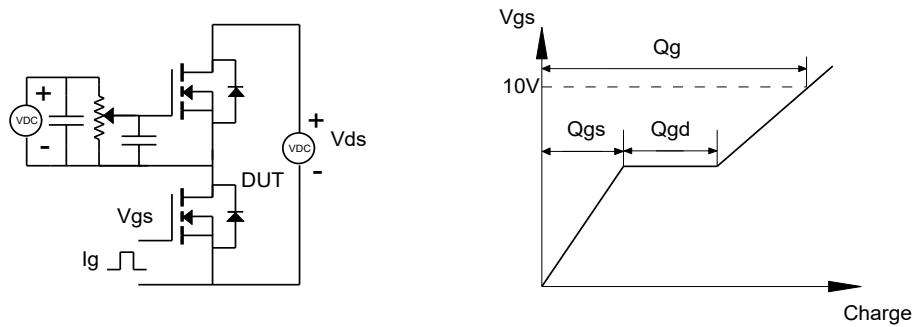


Figure 1: Gate Charge Test Circuit & Waveform

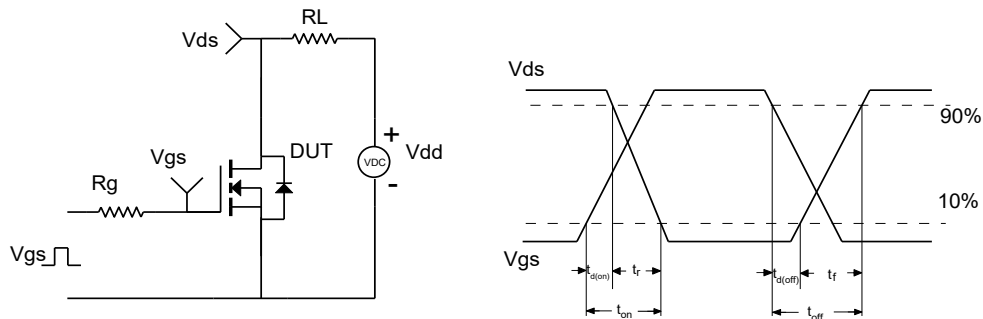


Figure 2: Resistive Switching Test Circuit & Waveform

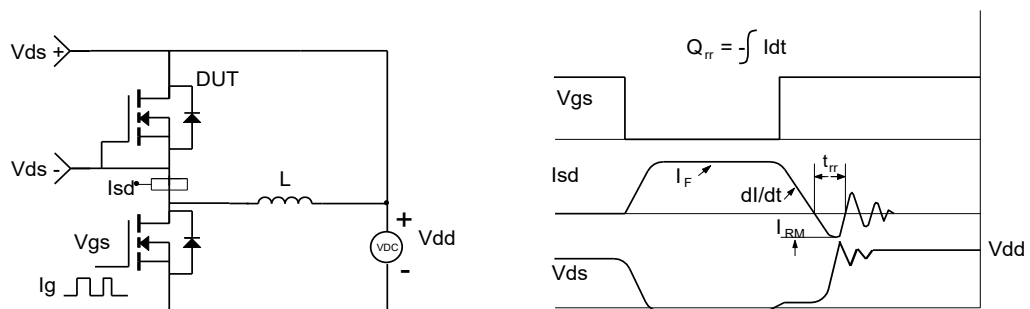


Figure 3: Diode Recovery Test Circuit & Waveform

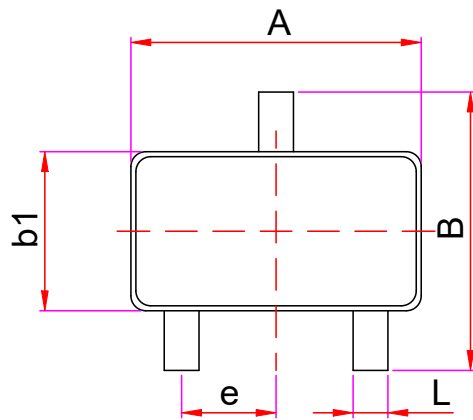


PJM09N20SC

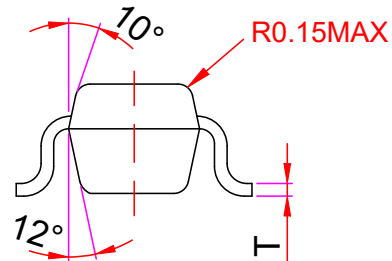
N-Channel Enhancement Mode Power MOSFET

Package Outline

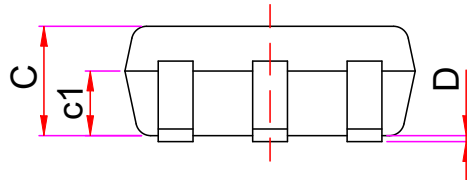
SOT-23-3



TOP VIEW



SIDE VIEW

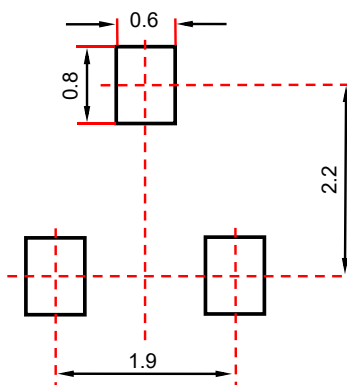


SIDE VIEW

Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	2.820	2.920	3.020	0.111	0.115	0.119
B	2.700	2.800	2.900	0.106	0.110	0.114
b1	1.500	1.600	1.700	0.059	0.063	0.067
L	0.300	0.350	0.400	0.012	0.014	0.016
C	1.000	1.100	1.200	0.039	0.043	0.047
c1	0.550	0.650	0.750	0.022	0.026	0.030
D	0.010	0.060	0.110	0.001	0.002	0.004
T	0.107	0.127	0.177	0.004	0.005	0.007
e	0.850	0.950	1.050	0.033	0.037	0.041

Suggested Pad Layout

SOT-23-3



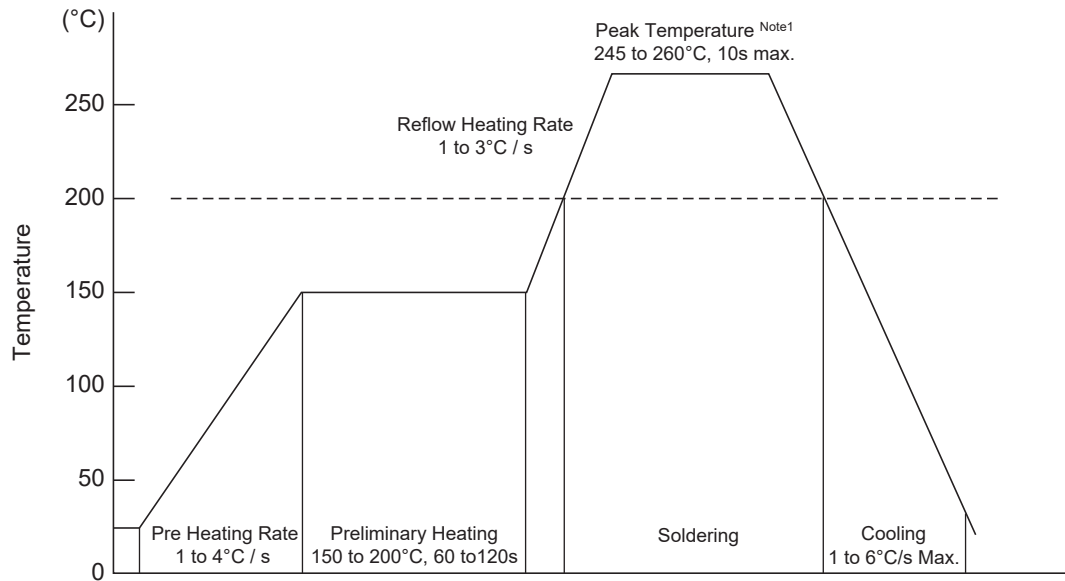
Note:

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

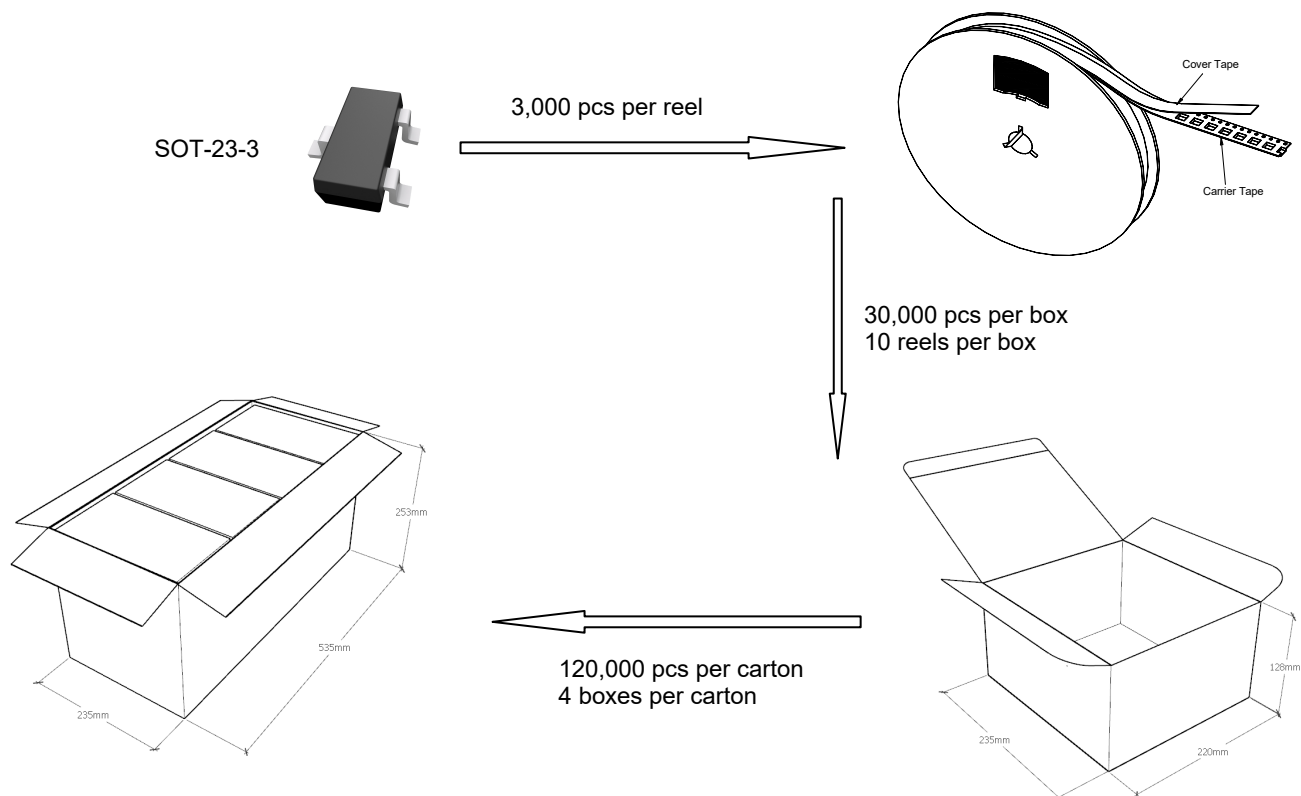
168 Hours

● Recommended period

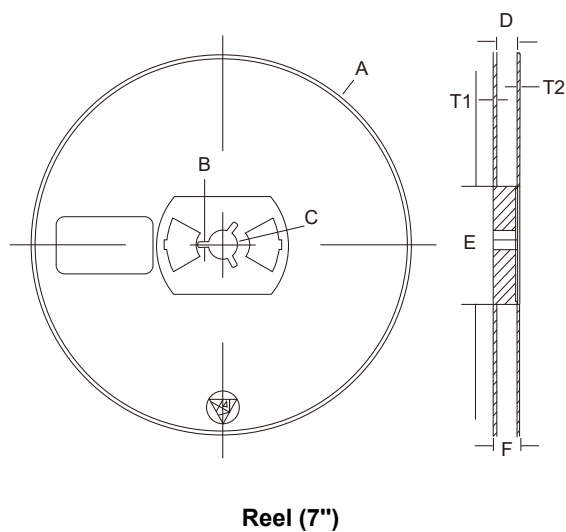
Five year after manufacturing(Depends on storage conditions)

Package Specifications

- The method of packaging



◆ Embossed tape and reel data



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



PJM09N20SC

N-Channel Enhancement Mode Power MOSFET

◆ Embossed tape data

