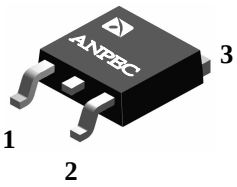
APM2522NU

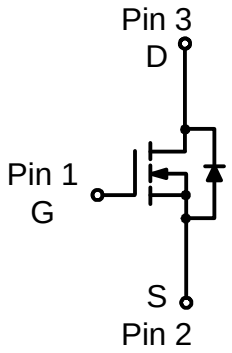
N-Channel Enhancement Mode MOSFET

Features

- 25V/30A,
  $R_{DS(ON)}$=15mΩ (typ.) @ V_{GS}=10V
  $R_{DS(ON)}$=22mΩ (typ.) @ V_{GS}=4.5V
- Super High Dense Cell Design
- Avalanche Rated
- Reliable and Rugged
- Lead Free Available (RoHS Compliant)

Pin Description





Applications

- Power Management in Desktop Computer or DC/DC Converters

Ordering and Marking Information

APM2522N □□-□□□ Lead Free Code Handling Code Temp. Range Package Code	Package Code U : TO-252 Operating Junction Temp. Range C : -55 to 150 °C Handling Code TU : Tube TR : Tape & Reel Lead Free Code L : Lead Free Device Blank : Original Device
APM2522N U : 	XXXXX - Date Code

Note: ANPEC lead-free products contain molding compounds and 100% matte tin plate termination finish; which are fully compliant with RoHS and compatible with both SnPb and lead-free soldiering operations. ANPEC lead-free products meet or exceed the lead-free requirements of IPC/JEDEC J STD-020C for MSL classification at lead-free peak reflow temperature.

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_A = 25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		25	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C=25°C	20	A
I_{DP}	300µs Pulse Drain Current Tested	T_C=25°C	100	A
		T_C=100°C	70	
Mounted on Large Heat Sink				
I_D	Continuous Drain Current	T_C=25°C	30*	A
		T_C=100°C	20	
P_D	Maximum Power Dissipation	T_C=25°C	50	W
		T_C=100°C	20	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		2.5	°C/W
Mounted on PCB of 1in^2 Pad Area				
I_D	Continuous Drain Current	T_A=25°C	9	A
		T_A=100°C	6	
P_D	Maximum Power Dissipation	T_A=25°C	2.5	W
		T_A=100°C	1	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		50	°C/W
Mounted on PCB of Minimum Footprint				
I_D	Continuous Drain Current	T_A=25°C	7	A
		T_A=100°C	4	
P_D	Maximum Power Dissipation	T_A=25°C	1.5	°C/W
		T_A=100°C	0.5	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		75	°C/W

Notes：

* Current limited by bond wire.

Electrical Characteristics (T_A = 25°C)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	25			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V			1	μA
		T_J=85°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1	1.5	2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ [a]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=20A		15	20	mΩ
		V_{GS}=4.5V, I_{DS}=10A		22	28	
Diode Characteristics						
V_{SD} [a]	Diode Forward Voltage	I_{SD}=10A, V_{GS}=0V		0.7	1.1	V
t_{rr}	Reverse Recovery Time	I_{SD}=10A, dI_{SD}/dt =100A/μs		50		ns
Q_{rr}	Reverse Recovery Charge			3		nC
Dynamic Characteristics [b]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		2		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz		825		pF
C_{oss}	Output Capacitance			125		
C_{rss}	Reverse Transfer Capacitance			85		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω		13	24	ns
t_r	Turn-on Rise Time			19	35	
$t_{d(OFF)}$	Turn-off Delay Time			31	57	
t_f	Turn-off Fall Time			5	10	
Gate Charge Characteristics [b]						
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_{DS}=20A		17	24	nC
Q_{gs}	Gate-Source Charge			2		
Q_{gd}	Gate-Drain Charge			5		

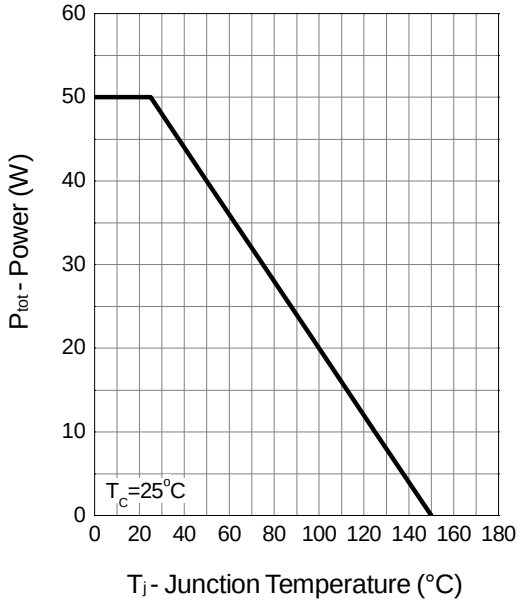
Notes:

a : Pulse test ; pulse width ≤300μs, duty cycle ≤ 2%.

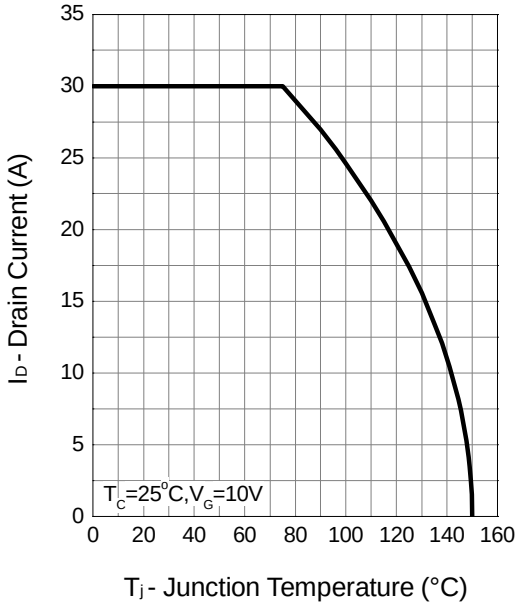
b : Guaranteed by design, not subject to production testing.

Typical Characteristics

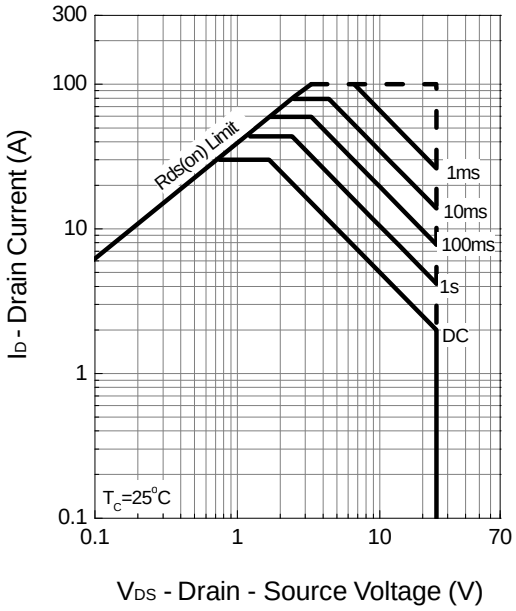
Power Dissipation



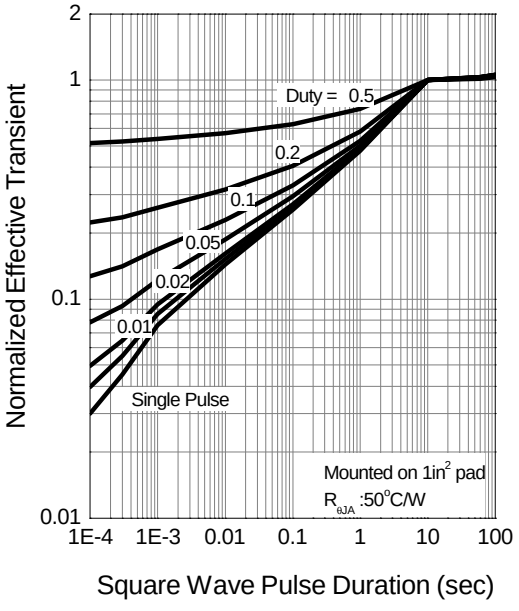
Drain Current



Safe Operation Area

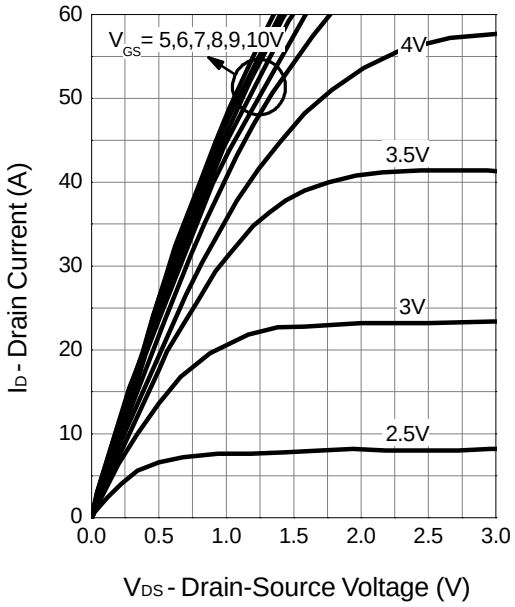


Thermal Transient Impedance

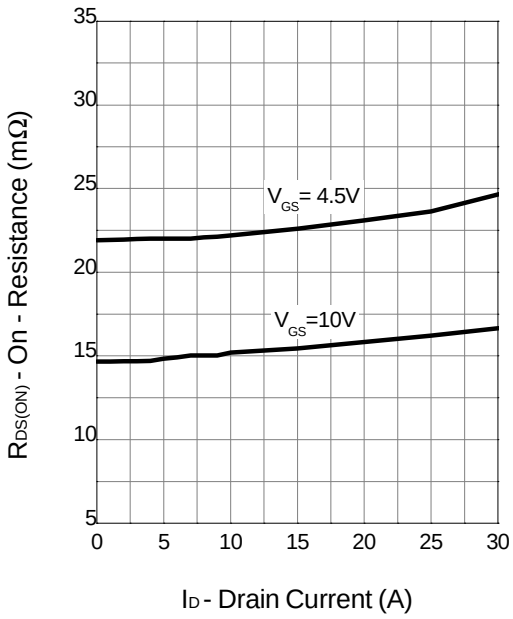


Typical Characteristics (Cont.)

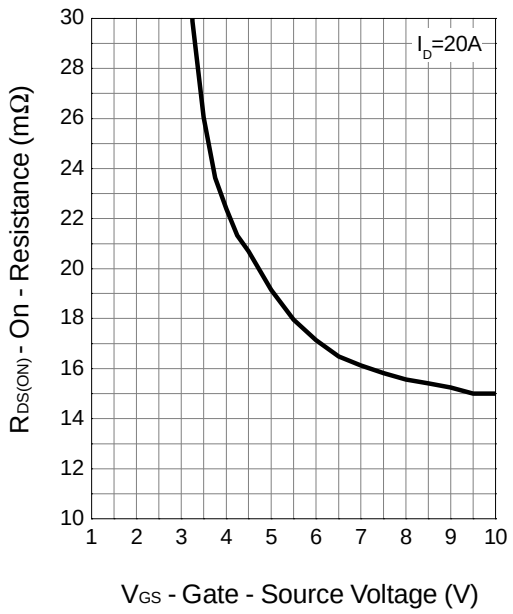
Output Characteristics



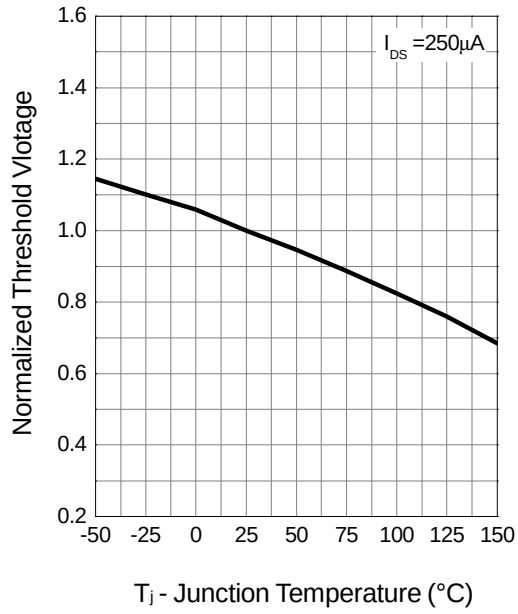
Drain-Source On Resistance



Drain-Source On Resistance

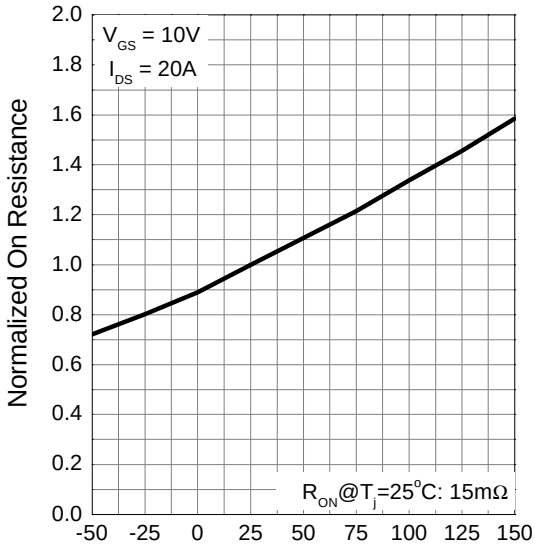


Gate Threshold Voltage

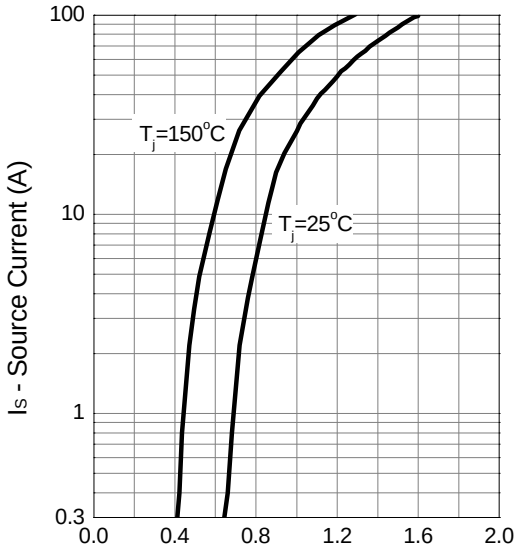


Typical Characteristics (Cont.)

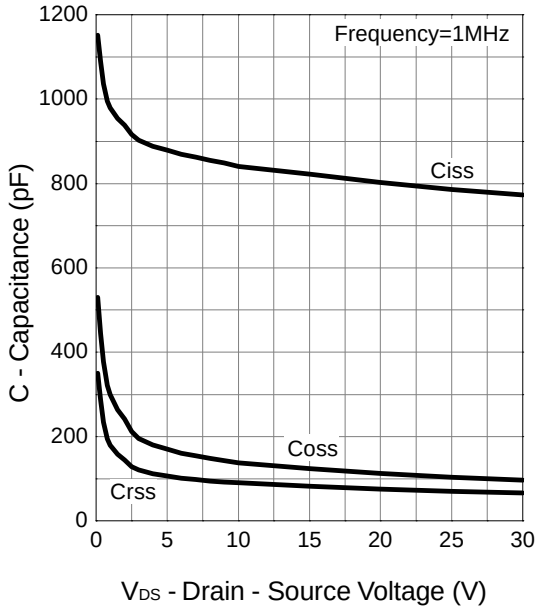
Drain-Source On Resistance



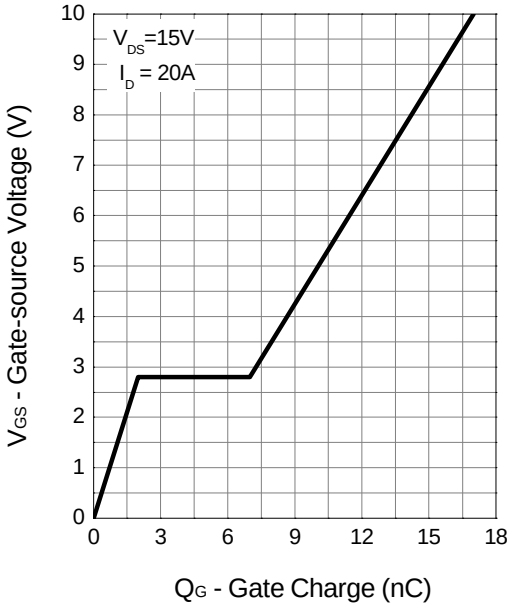
Source-Drain Diode Forward



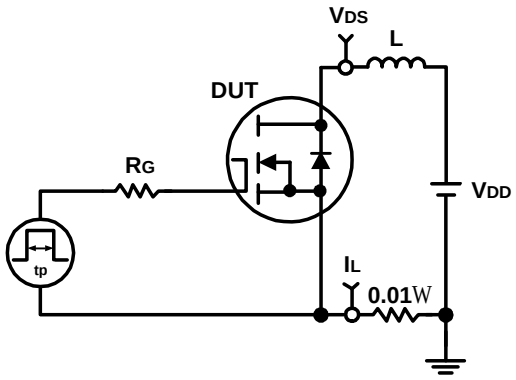
Capacitance

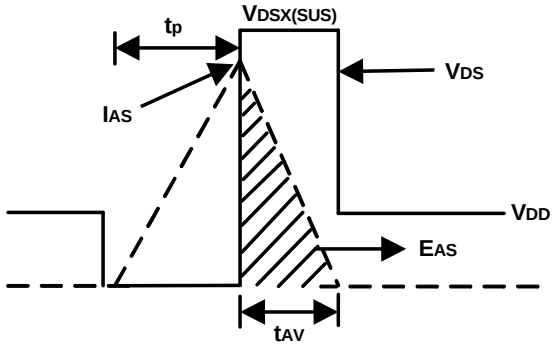


Gate Charge



Avalanche Test Circuit and Waveforms





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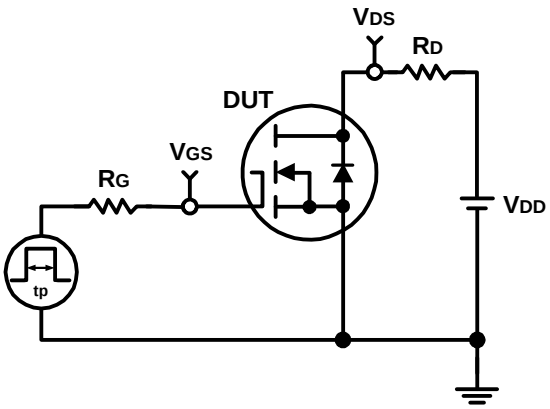
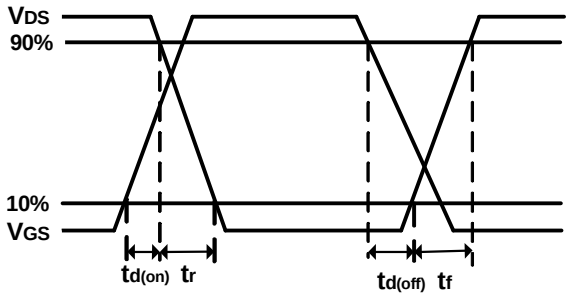
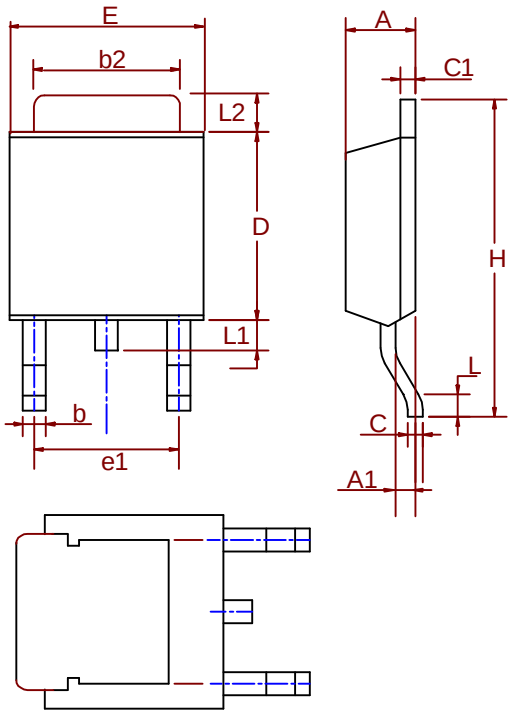




Packaging Information

TO-252 (Reference JEDEC Registration TO-252)

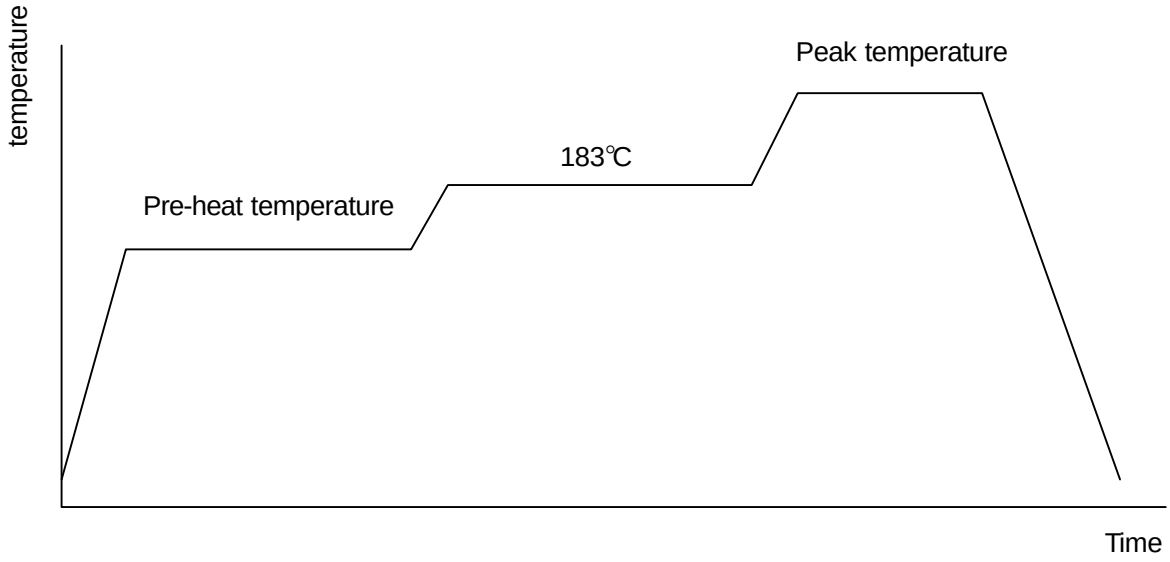


Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.18	2.39	0.086	0.094
A1	0.89	1.27	0.035	0.050
b	0.508	0.89	0.020	0.035
b2	5.207	5.461	0.205	0.215
C	0.46	0.58	0.018	0.023
C1	0.46	0.58	0.018	0.023
D	5.334	6.22	0.210	0.245
E	6.35	6.73	0.250	0.265
e1	3.96	5.18	0.156	0.204
H	9.398	10.41	0.370	0.410
L	0.51		0.020	
L1	0.64	1.02	0.025	0.040
L2	0.89	2.032	0.035	0.080

Physical Specifications

Terminal Material	Solder-Plated Copper (Solder Material : 90/10 or 63/37 SnPb)
Lead Solderability	Meets EIA Specification RSI86-91, ANSI/J-STD-002 Category 3.

Reflow Condition (IR/Convection or VPR Reflow)



Classification Reflow Profiles

	Convection or IR/ Convection	VPR
Average ramp-up rate (183°C to Peak)	3°C/ second max.	10°C /second max.
Preheat temperature (125 ±25°C)	120 seconds max.	
Temperature maintained above 183°C	60~150 seconds	
Time within 5°C of actual peak temperature	10~20 seconds	60 seconds
Peak temperature range	220 + 5/-0°C or 235 +5°C/-0°C	215~ 219 °C or 235 +5°C/-0°C
Ramp-down rate	6°C /second max.	10°C /second max.
Time 25°C to peak temperature	6 minutes max.	

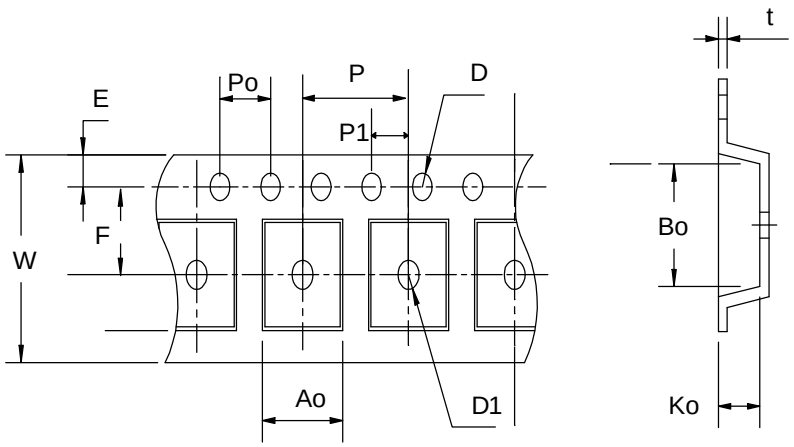
Classification Reflow Profiles

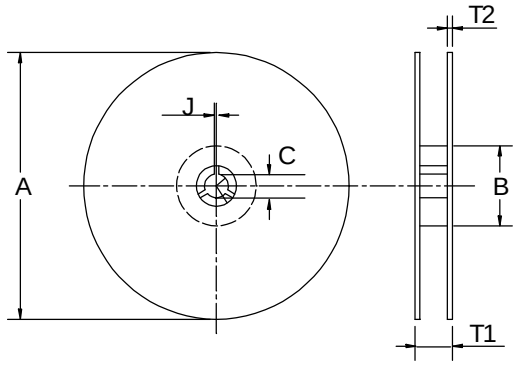
pkg. thickness ³ 2.5mm and all bags	pkg. thickness < 2.5mm and pkg. volume ³ 350mm³	pkg. thickness < 2.5mm and pkg. volume < 350mm³
Convection 220 +5/-0 ℃		Convection 235 +5/-0 ℃
VPR 215-219 ℃		VPR 235 +5/-0 ℃
IR/Convection 220 +5/-0 ℃		IR/Convection 220 +5/-0 ℃

Reliability test program

Test item	Method	Description
SOLDERABILITY	MIL-STD-883D-2003	245°C,5 SEC
HOLT	MIL-STD 883D-1005.7	1000 Hrs Bias @125°C
PCT	JESD-22-B, A102	168 Hrs, 100% RH, 121°C
TST	MIL-STD 883D-1011.9	-65°C ~ 150°C, 200 Cycles

Carrier Tape & Reel Dimensions





Application	A	B	C	J	T1	T2	W	P	E
TO-252	330±3	100±2	13±0.5	2±0.5	16.4+0.3 -0.2	2.5±0.5	16+0.3 16-0.1	8±0.1	1.75±0.1
	F	D	D1	Po	P1	Ao	Bo	Ko	t
	7.5±0.1	1.5±0.1	1.5±0.25	4.0±0.1	2.0±0.1	6.8±0.1	10.4±0.1	2.5±0.1	0.3±0.05

(mm)

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