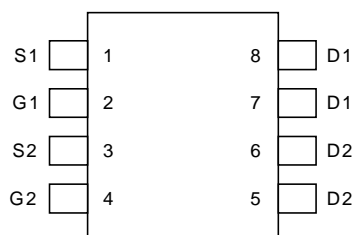


## P-Channel Enhancement Mode MOSFET

## Features

- 30V/-6.1A,  $R_{DS(ON)} = 24m\Omega(\text{typ.}) @ V_{GS} = -10V$   
 $R_{DS(ON)} = 30m\Omega(\text{typ.}) @ V_{GS} = -4.5V$
- Super High Density Cell Design
- Reliable and Rugged
- SO-8 Package

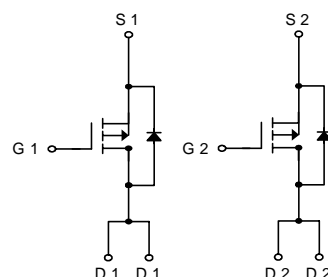
## Pin Description



SO – 8

## Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems



P-Channel MOSFET

## Ordering and Marking Information

APM4925 <span style="border: 1px solid black; padding: 2px;">□□-□□</span> <div style="margin-left: 40px;"> <span style="border: 1px solid black; padding: 2px;">□□</span> Handling Code  <span style="border: 1px solid black; padding: 2px;">□□</span> Temp. Range  <span style="border: 1px solid black; padding: 2px;">□□</span> Package Code         </div>	Package Code K : SO-8 Operation Junction Temp. Range C : -55 to 150°C Handling Code TU : Tube TR : Tape & Reel
APM4925 <span style="border: 1px solid black; padding: 2px;">APM4925 XXXXXX</span>	XXXXXX - Date Code

Absolute Maximum Ratings  $(T_A = 25^\circ\text{C unless otherwise noted})$ 

Symbol	Parameter		Rating	Unit
$V_{DSS}$	Drain-Source Voltage		-30	V
$V_{GSS}$	Gate-Source Voltage		$\pm 25$	
$I_D^*$	Maximum Drain Current – Continuous	$T_A = 25^\circ\text{C}$	-6.1	A
$I_{DM}$	Maximum Drain Current – Pulsed		-40	

\*Surface Mounted on FR4 Board,  $t \leq 10$  sec.

ANPEC reserves the right to make changes to improve reliability or manufacturability without notice, and advise customers to obtain the latest version of relevant information to verify before placing orders.

## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Unit
$P_D$	Maximum Power Dissipation	$T_A = 25^\circ\text{C}$	W
		$T_A = 100^\circ\text{C}$	
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	
$R_{\theta JA}$	Thermal Resistance - Junction to Ambient	50	$^\circ\text{C/W}$

## Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Condition	APM4925			Unit
			Min.	Typ <sup>a</sup>	Max.	
Static						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> = -250μA	-30			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = -24V, V <sub>GS</sub> =0V			-1	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1	-1.5	-2	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> = ±25V , V <sub>DS</sub> =0V			±100	nA
R <sub>DS(ON)</sub> <sup>b</sup>	Drain-Source On-state Resistance	V <sub>GS</sub> = -10V, I <sub>D</sub> = -6.1A		24	27	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -5.1A		30	35	
V <sub>SD</sub> <sup>b</sup>	Diode Forward Voltage	I <sub>SD</sub> = -1.7A, V <sub>GS</sub> =0V		-0.7	-1.3	V
Dynamic <sup>a</sup>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -4.6A		48	58	nC
Q <sub>gs</sub>	Gate-Source Charge			10		
Q <sub>gd</sub>	Gate-Drain Charge			9		
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> = -25V, R <sub>L</sub> =12.5Ω, I <sub>D</sub> = -2A , V <sub>GEN</sub> = -10V, R <sub>G</sub> =6Ω,		17	33	ns
t <sub>r</sub>	Turn-on Rise Time			18	35	
t <sub>d(OFF)</sub>	Turn-off Delay Time			70	128	
t <sub>f</sub>	Turn-off Fall Time			30	56	
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> = -25V Frequency = 1.0MHZ		3200		pF
C <sub>oss</sub>	Output Capacitance			560		
C <sub>rss</sub>	Reverse Capacitance			250		

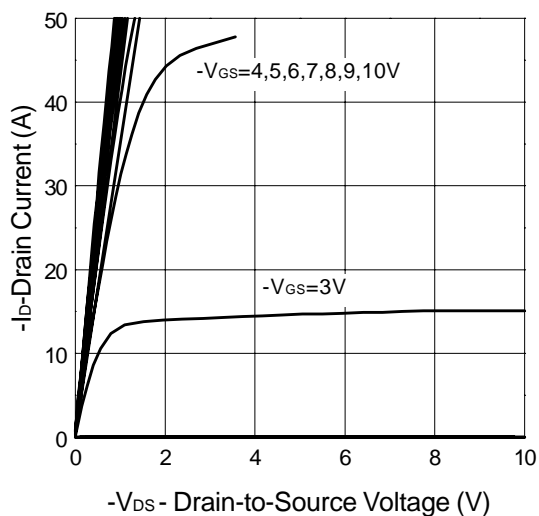
### Notes

<sup>a</sup> : Guaranteed by design, not subject to production testing

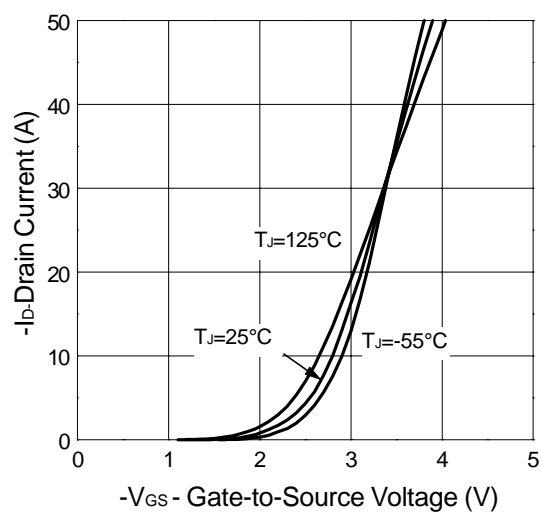
<sup>b</sup> : Pulse test ; pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$

## Typical Characteristics

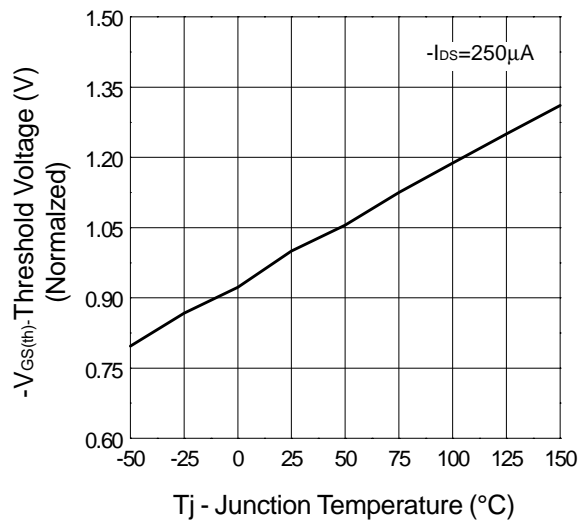
Output Characteristics



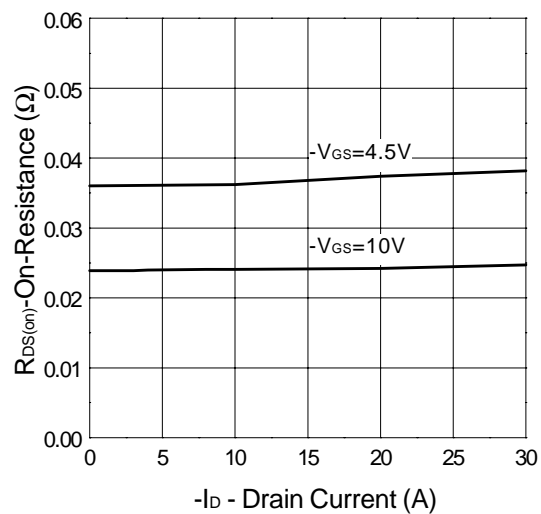
Transfer Characteristics



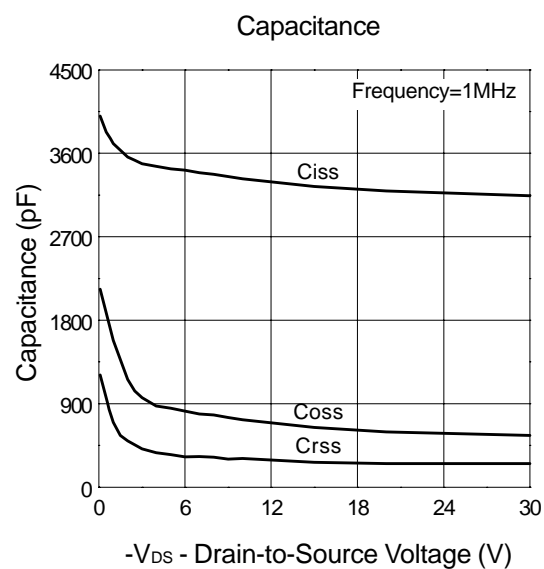
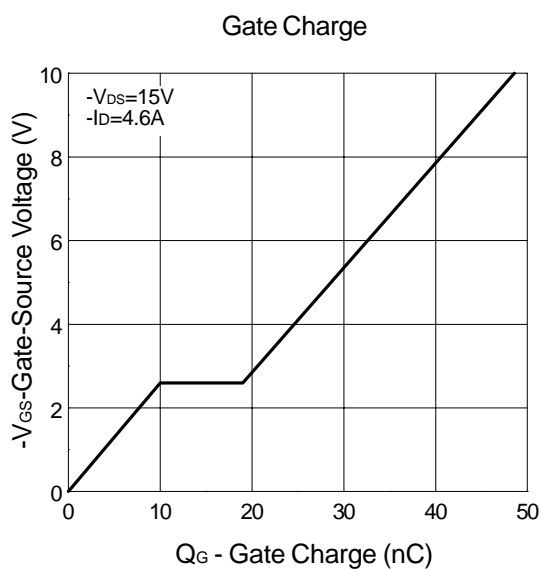
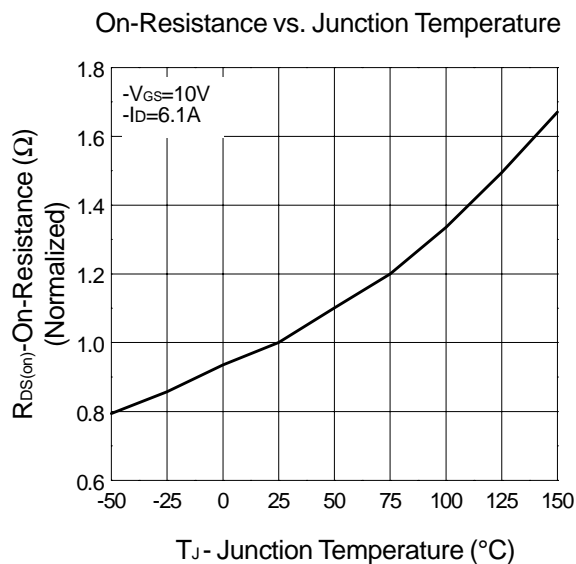
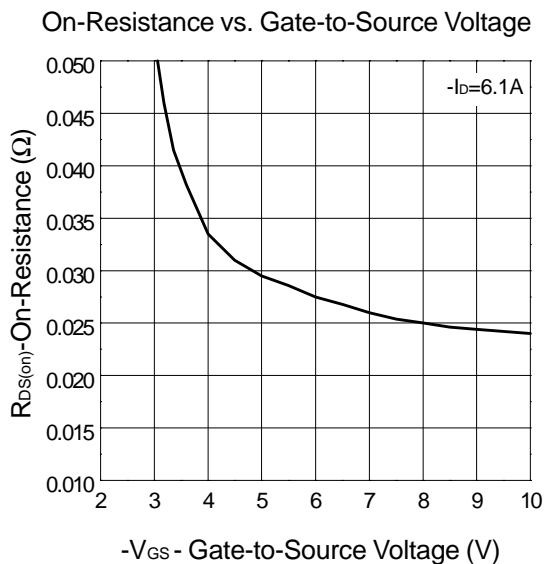
Threshold Voltage vs. Junction Temperature



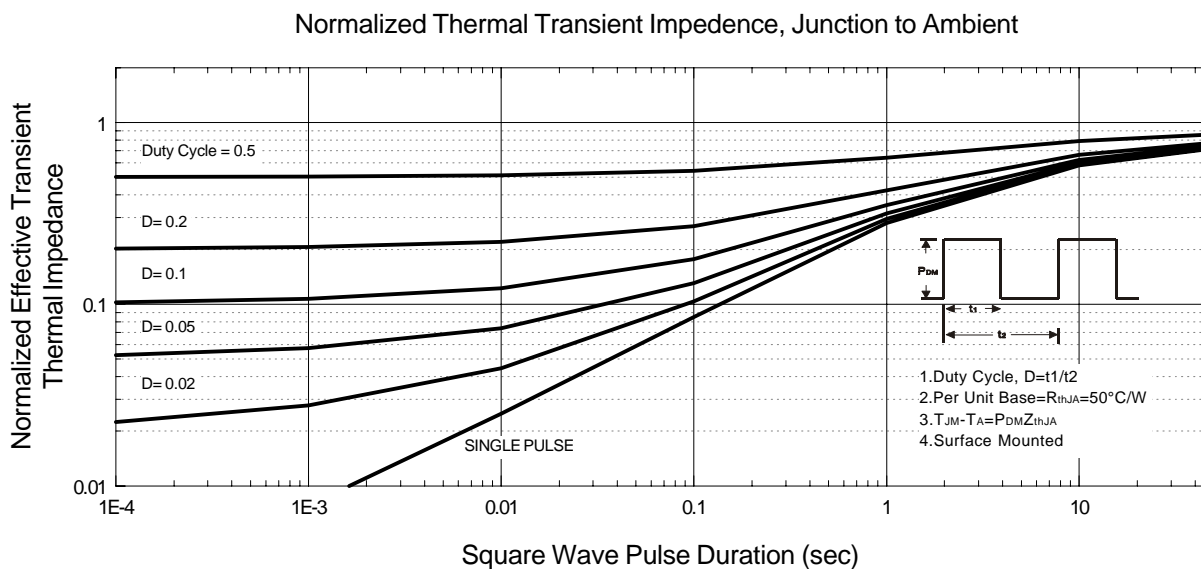
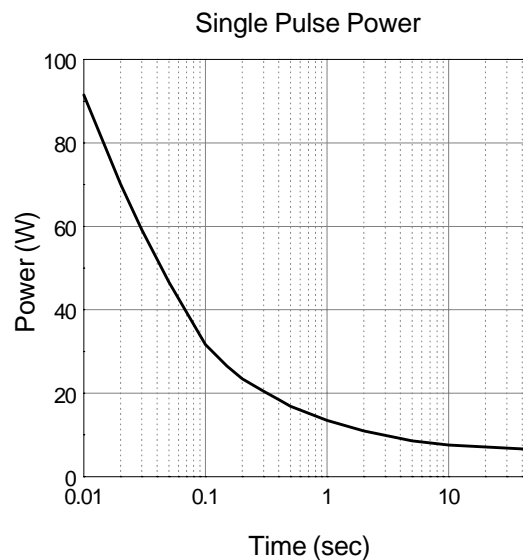
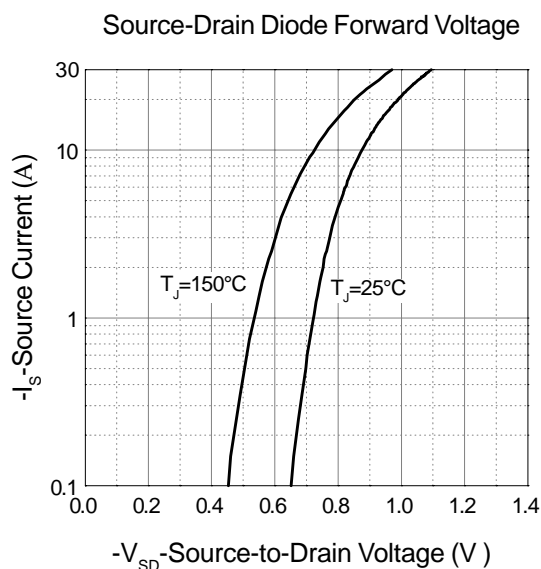
On-Resistance vs. Drain Current



## Typical Characteristics

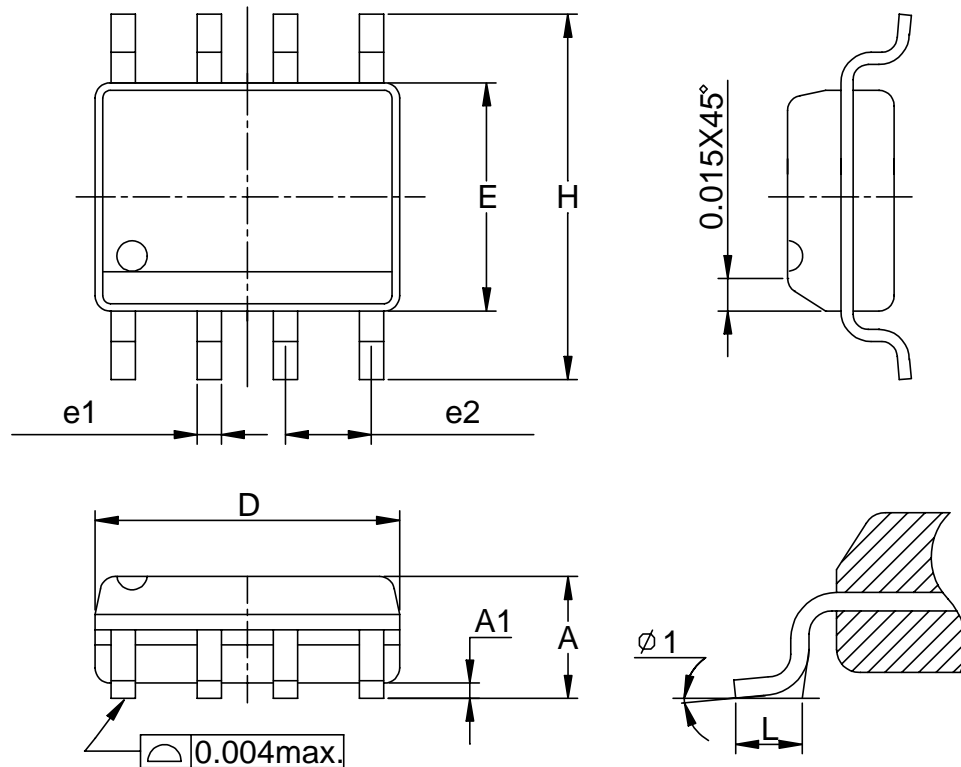


## Typical Characteristics



## Package Information

SOP-8 pin ( Reference JEDEC Registration MS-012)



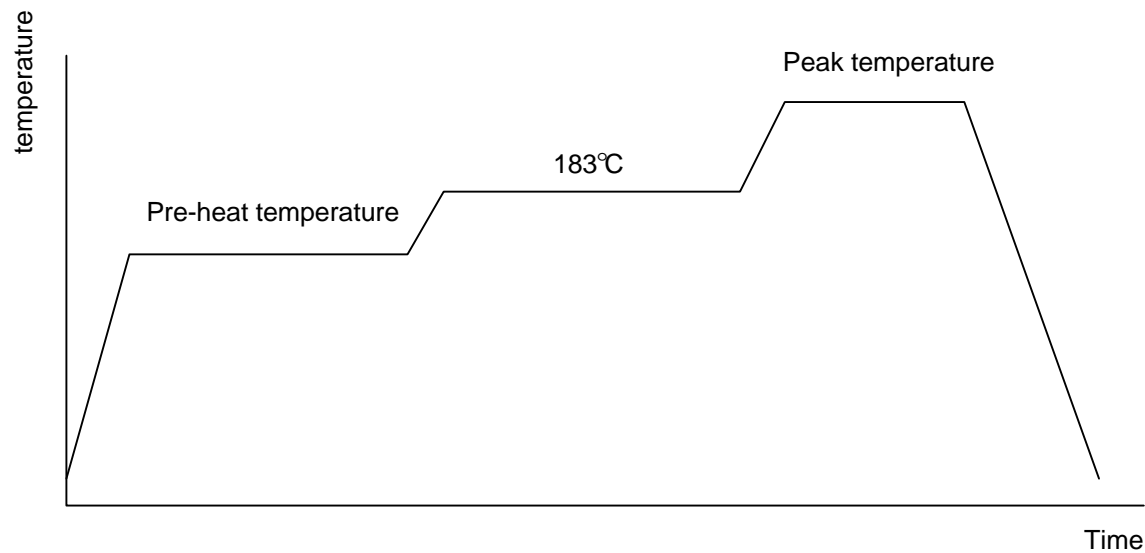
Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	5.00	0.189	0.197
E	3.80	4.00	0.150	0.157
H	5.80	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
e1	0.33	0.51	0.013	0.020
e2	1.27BSC		0.50BSC	
φ 1	8°		8°	

## 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.
Packaging	2500 devices per reel for SOP-8

### Reflow Condition (IR/Convection or VPR Reflow)

Reference JEDEC Standard J-STD-020A APRIL 1999



### 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/-0°C	215~ 219°C or 235 +5/-0°C
Ramp-down rate	6 °C /second max.	10 °C /second max.
Time 25°C to peak temperature	6 minutes max.	

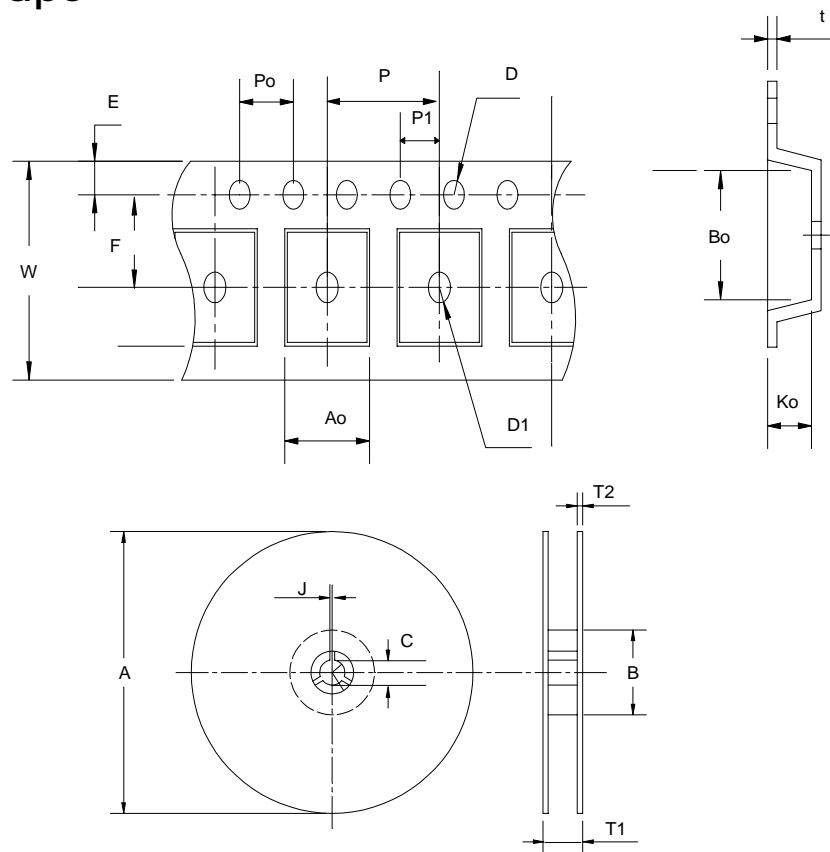
### Package Reflow Conditions

pkg. thickness ≥ 2.5mm and all bags	pkg. thickness < 2.5mm and pkg. volume ≥ 350 mm <sup>3</sup>	pkg. thickness < 2.5mm and pkg. volume < 350mm <sup>3</sup>
Convection 220 +5/-0 °C		Convection 235 +5/-0 °C
VPR 215-219 °C		VPR 235 +5/-0 °C
IR/Convection 220 +5/-0 °C		IR/Convection 235 +5/-0 °C

## 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
ESD	MIL-STD-883D-3015.7	VHBM > 2KV, VMM > 200V
Latch-Up	JESD 78	10ms , I <sub>tr</sub> > 100mA

## Carrier Tape



Application	A	B	C	J	T1	T2	W	P	E
SOP- 8	330 ± 1	62 +1.5	12.75+ 0.15	2 ± 0.5	12.4 ± 0.2	2 ± 0.2	12± 0. 3	8± 0.1	1.75±0.1
	F	D	D1	P <sub>0</sub>	P1	A <sub>0</sub>	B <sub>0</sub>	K <sub>0</sub>	t
	5.5± 1	1.55 +0.1	1.55+ 0.25	4.0 ± 0.1	2.0 ± 0.1	6.4 ± 0.1	5.2± 0. 1	2.1± 0.1	0.3±0.013
	F	D	D1	P <sub>0</sub>	P1	A <sub>0</sub>	B <sub>0</sub>	K <sub>0</sub>	t
	11.5 ± 0.1	1.5 +0.1	1.5+ 0.25	4.0 ± 0.1	2.0 ± 0.1	8.2 ± 0.1	13± 0.1	2.5± 0.1	0.35±0.013



## Cover Tape Dimensions

Carrier Width	12
Cover Tape Width	9.3

(mm)

## Customer Service

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