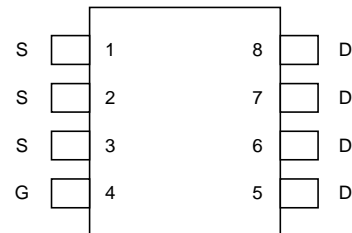


P-Channel Enhancement Mode MOSFET

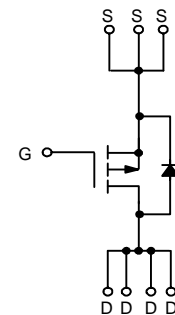
Features

- 30V/-8A, $R_{DS(ON)} = 16m\Omega(\text{typ.}) @ V_{GS} = -10V$
 $R_{DS(ON)} = 24m\Omega(\text{typ.}) @ V_{GS} = -4.5V$
- Super High Density Cell Design
- Reliable and Rugged
- SO-8 Package

Pin Description



SO-8



P-Channel MOSFET

Applications

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

Ordering and Marking Information

<p>APM4835 □□-□□□</p> <p>Lead Free Code</p> <p>Handling Code</p> <p>Temp. Range</p> <p>Package Code</p>	<p>Package Code K : SO-8</p> <p>Operation Junction Temp. Range C : -55 to 150°C</p> <p>Handling Code TU : Tube TR : Tape & Reel</p> <p>Lead Free Code L : Lead Free Device Blank : Original Device</p>
<p>APM4835</p> <p>APM4835 XXXXX</p>	<p>XXXXX - Date Code</p>

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	± 25	
I_D^*	Maximum Drain Current – Continuous	-8	A
I_{DM}	Maximum Drain Current – Pulsed	-50	

*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 (Cont.) ($T_A = 25^\circ\text{C}$ 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)

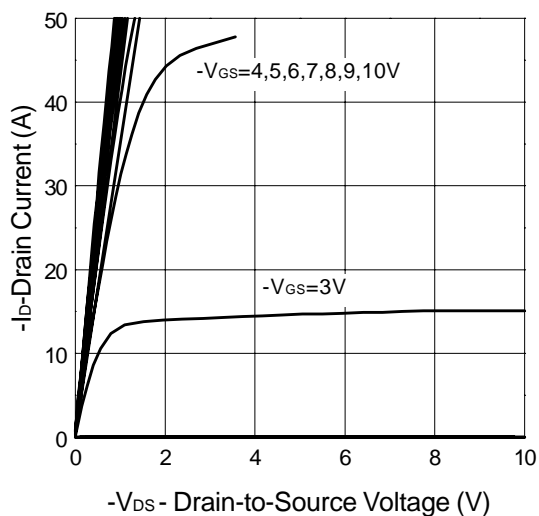
Symbol	Parameter	Test Condition	APM4835			Unit
			Min.	Typ ^a	Max.	
Static						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -30V, V _{GS} =0V			-1	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = -250μA	-1	-1.5	-2	V
I _{GSS}	Gate Leakage Current	V _{GS} = ±25V , V _{DS} =0V			±100	nA
R _{DS(ON)}	Drain-Source On-state Resistance ^b	V _{GS} = -10V, I _D = -8A		16	19	mΩ
		V _{GS} = -4.5V, I _D = -5A		24	30	
V _{SD}	Diode Forward Voltage ^b	I _{SD} = -3A, V _{GS} =0V		-0.7	-1.3	V
Dynamic ^a						
Q _g	Total Gate Charge	V _{DS} = -15V, V _{GS} = -10V, I _D = -4.6A		48	60	nC
Q _{gs}	Gate-Source Charge			10		
Q _{gd}	Gate-Drain Charge			9		
t _{d(ON)}	Turn-on Delay Time	V _{DD} = -25V, I _D = -2A, V _{GEN} = -10V, R _G =6Ω R _L =12.5Ω		16	30	ns
t _r	Turn-on Rise Time			17	30	
t _{d(OFF)}	Turn-off Delay Time			75	120	
t _f	Turn-off Fall Time			31	80	
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-25V Frequency = 1.0MHZ		3800		pF
C _{oss}	Output Capacitance			590		
C _{rss}	Reverse Transfer Capacitance			250		

Notes
^a : Guaranteed by design, not subject to production testing

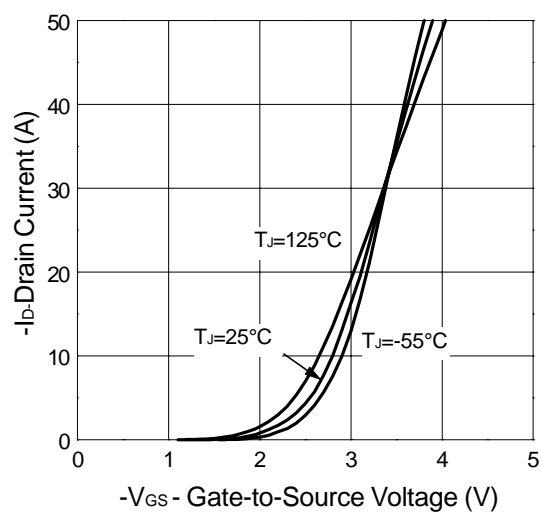
^b : Pulse test ; pulse width $\leq 500\mu s$, duty cycle $\leq 2\%$

Typical Characteristics

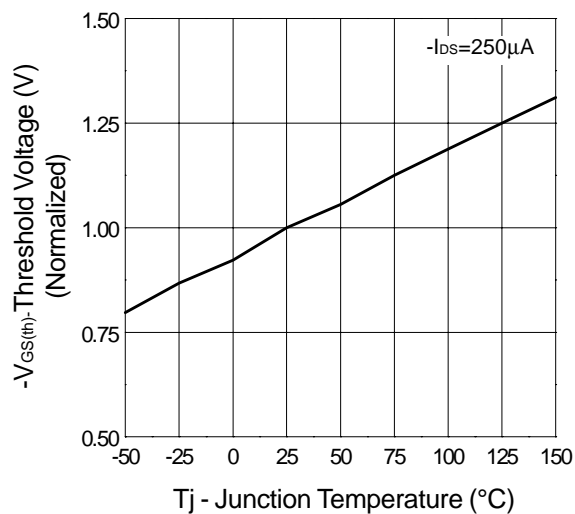
Output Characteristics



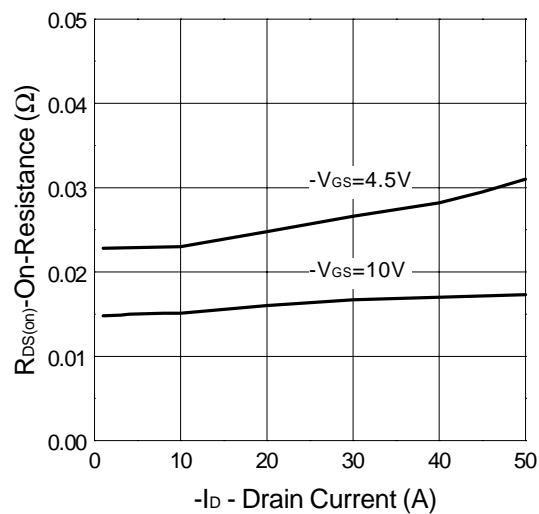
Transfer Characteristics



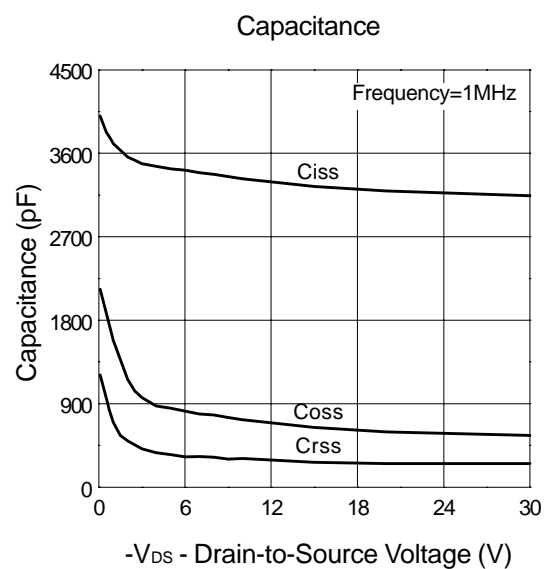
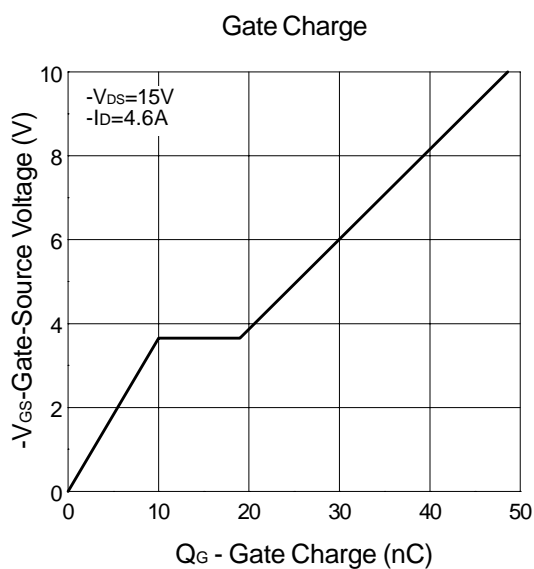
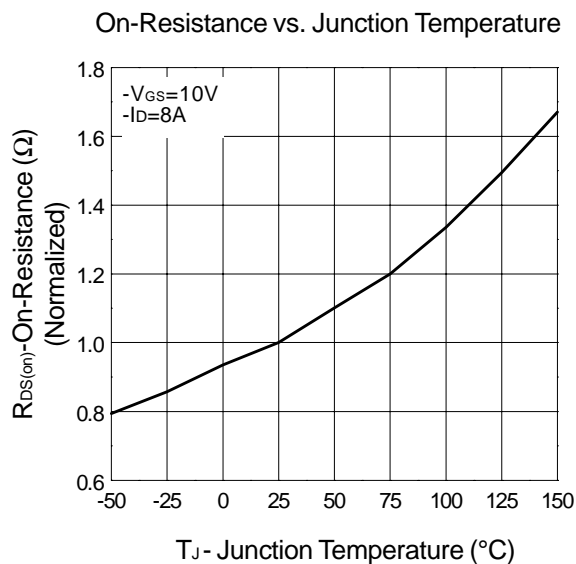
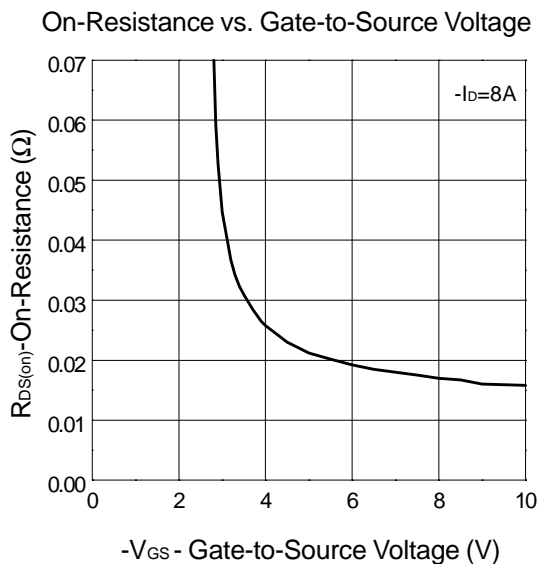
Threshold Voltage vs. Junction Temperature



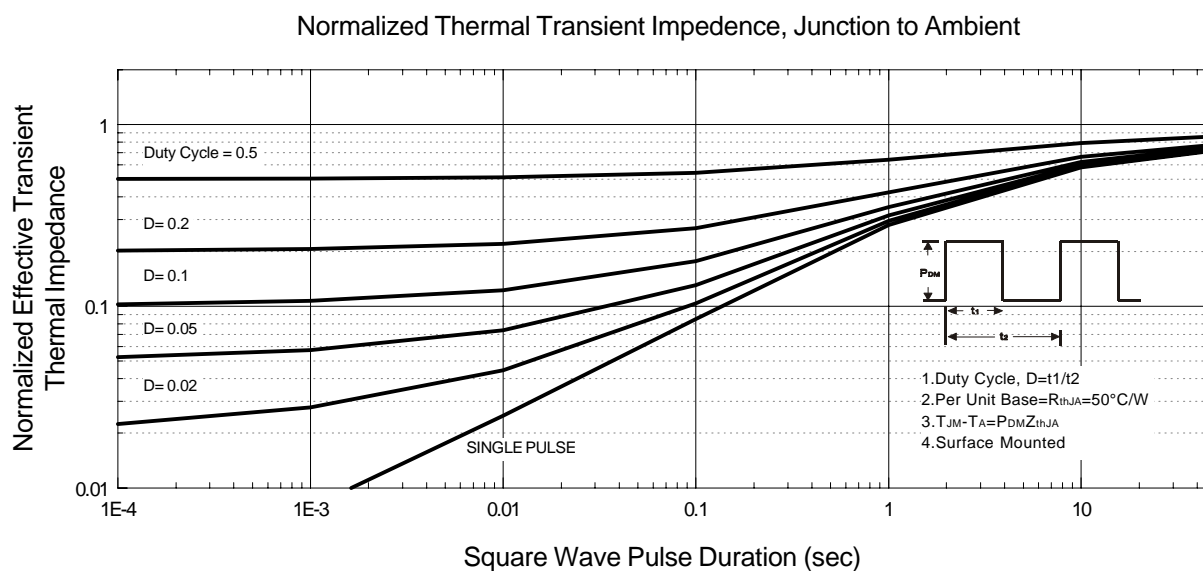
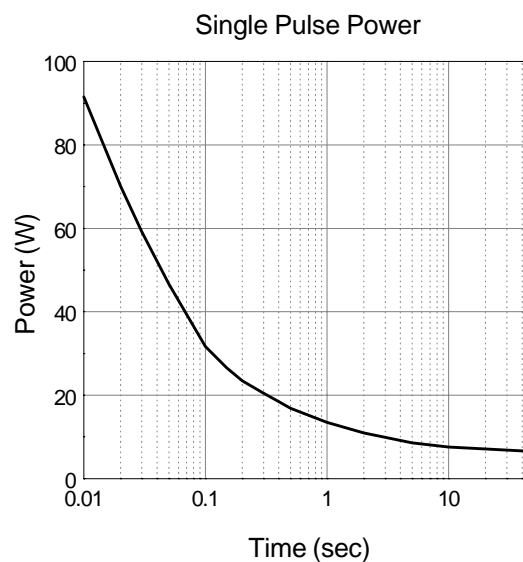
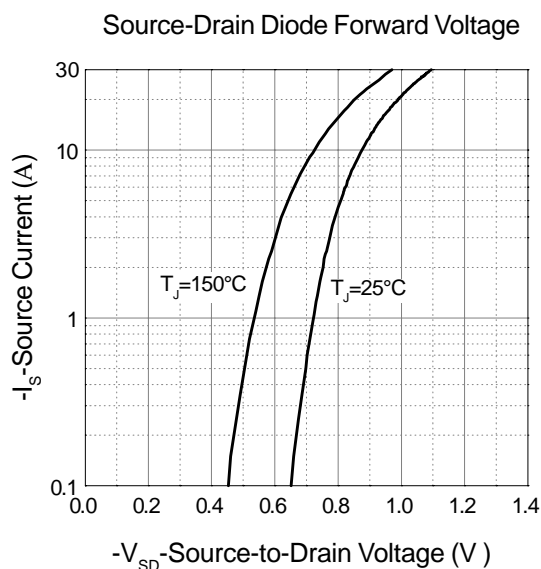
On-Resistance vs. Drain Current



Typical Characteristics (Cont.)

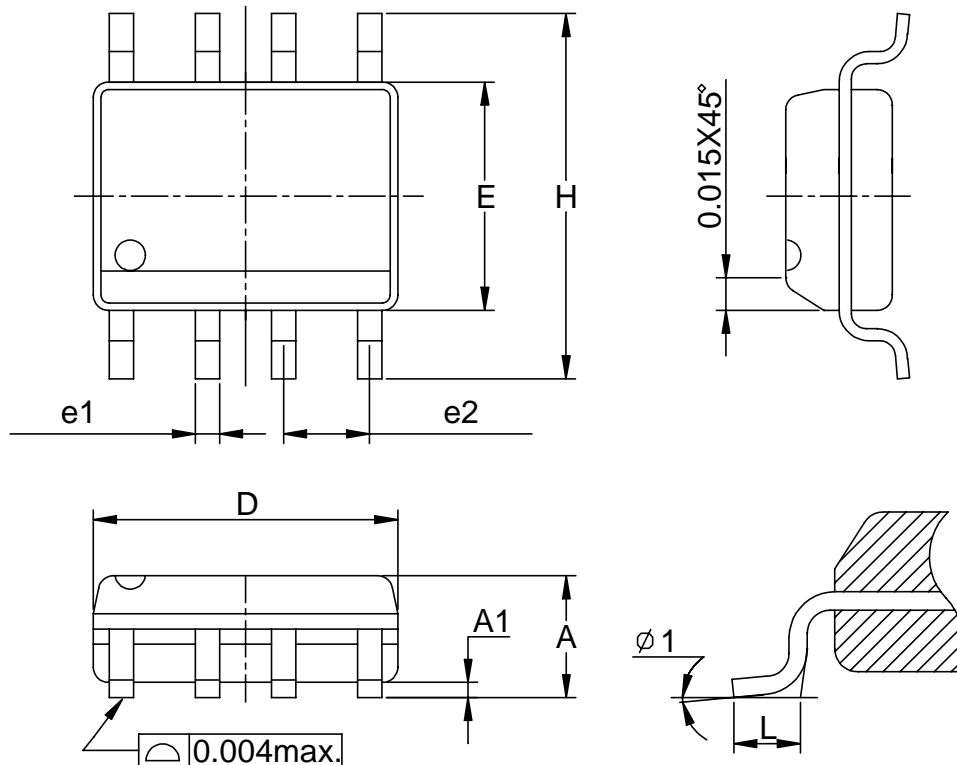


Typical Characteristics (Cont.)



Packaging Information

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

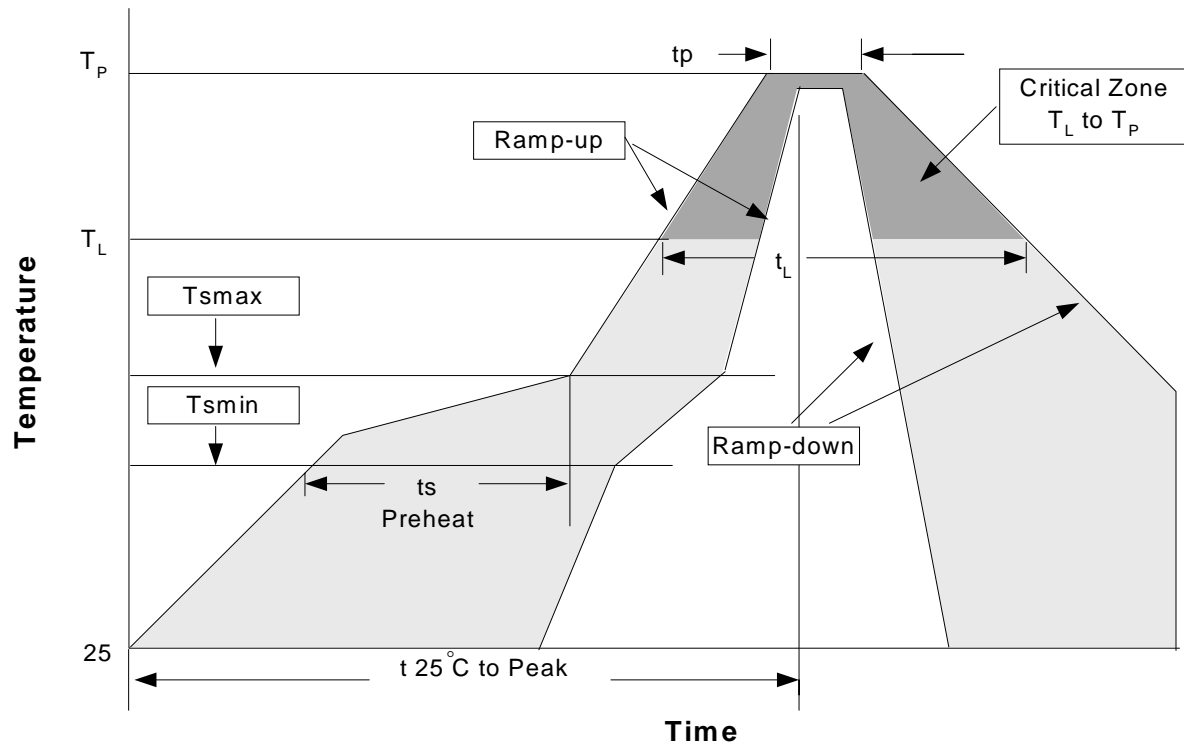


Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	5.00	0.189	0.197
E	3.80	4.00	0.150	0.157
H	5.80	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
e1	0.33	0.51	0.013	0.020
e2	1.27BSC		0.50BSC	
$\phi 1$	8°		8°	

Physical Specifications

Terminal Material	Solder-Plated Copper (Solder Material : 90/10 or 63/37 SnPb), 100%Sn
Lead Solderability	Meets EIA Specification RSI86-91, ANSI/J-STD-002 Category 3.

Reflow Condition (IR/Convection or VPR Reflow)



Classification Reflow Profiles

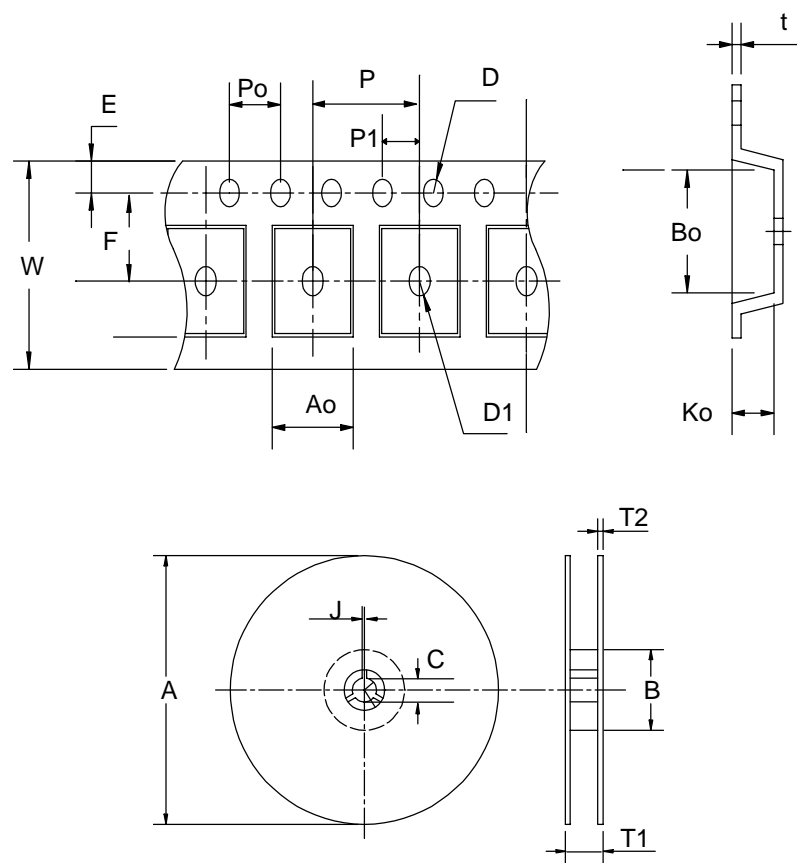
Profile Feature	Sn-Pb Eutectic Assembly		Pb-Free Assembly	
	Large Body	Small Body	Large Body	Small Body
Average ramp-up rate (T_L to T_P)	3°C/second max.		3°C/second max.	
Preheat				
- Temperature Min (T_{smin})	100°C		150°C	
- Temperature Max (T_{smax})	150°C		200°C	
- Time (min to max)(t_s)	60-120 seconds		60-180 seconds	
T_{smax} to T_L			3°C/second max	
- Ramp-up Rate				
T_{smax} to T_L				
- Temperature(T_L)	183°C		217°C	
- Time (t_L)	60-150 seconds		60-150 seconds	
Peak Temperature(T_P)	225 +0/-5°C	240 +0/-5°C	245 +0/-5°C	250 +0/-5°C
Time within 5°C of actual Peak Temperature(t_p)	10-30 seconds	10-30 seconds	10-30 seconds	20-40 seconds
Ramp-down Rate	6°C/second max.		6°C/second max.	
Time 25°C to Peak Temperature	6 minutes max.		8 minutes max.	

Note: All temperatures refer to topside of the package. Measured on the body surface.

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	T ₁	T ₂	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	D ₁	P ₀	P ₁	A ₀	B ₀	K ₀	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

(mm)

Cover Tape Dimensions

Application	Carrier Width	Cover Tape Width	Devices Per Reel
SOP- 8	12	9.3	2500

Customer Service

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