

Dual N-Channel Enhancement Mode MOSFET

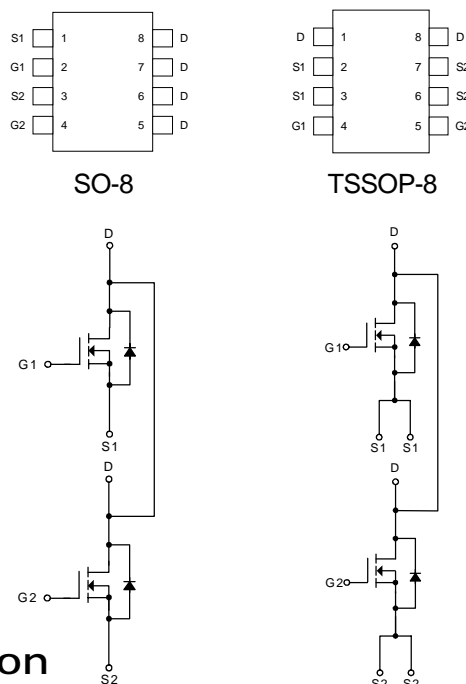
Features

- 20V/6A , $R_{DS(ON)}=28m\Omega(\text{typ.}) @ V_{GS}=4.5V$
 $R_{DS(ON)}=38m\Omega(\text{typ.}) @ V_{GS}=2.5V$
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- Reliable and Rugged
- SO-8 and TSSOP-8 Packages

Applications

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

Pin Description



Ordering and Marking Information

<p>APM9926A</p> <p>□□-□□□</p> <p>Lead Free Code</p> <p>Handling Code</p> <p>Temp. Range</p> <p>Package Code</p>	<p>Package Code</p> <p>K : SO-8 O : TSSOP-8</p> <p>Operation Junction Temp. Range</p> <p>C : -55 to 150°C</p> <p>Handling Code</p> <p>TR : Tape & Reel</p> <p>Lead Free Code</p> <p>L : Lead Free Device Blank : Original Device</p>
<p>APM9926A K/O :</p> <p>APM9926A 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	20	V
V_{GSS}	Gate-Source Voltage	± 10	
I_D^*	Maximum Drain Current – Continuous	6	A
I_{DM}	Maximum Drain Current – Pulsed	20	

* 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°C	SO-8	1.6	W
			TSSOP-8	1.0	
		T _A =100°C	SO-8	0.625	
			TSSOP-8	0.4	
T _J	Maximum Junction Temperature			150	°C
T _{STG}	Storage Temperature Range			-55 to 150	°C
R _{θJA}	Thermal Resistance – Junction to Ambient			80	°C/W

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

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

Symbol	Parameter	Test Condition	APM9926A			Unit	
			Min.	Typ.	Max.		
Static							
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _{DS} =250μA	20			V	
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V , V _{GS} =0V			1	μA	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.5	0.7	1.5	V	
I _{GSS}	Gate Leakage Current	V _{GS} =±10V , V _{DS} =0V			±100	nA	
R _{DS(ON)} ^a	Drain-Source On-state Resistance	V _{GS} =4.5V , I _{DS} =6A		28	32	mΩ	
		V _{GS} =2.5V , I _{DS} =5.2A		38	45		
V _{SD} ^a	Diode Forward Voltage	I _{SD} =1.7A , V _{GS} =0V		0.7	1.3	V	
Dynamic ^b							
Q _g	Total Gate Charge	V _{DS} =10V , I _{DS} = 6A		10	12	nC	
Q _{gs}	Gate-Source Charge		V _{GS} =4.5V ,		3.6		
Q _{gd}	Gate-Drain Charge				2		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V , I _{DS} =1A , V _{GEN} =4.5V , R _G =0.2Ω		17		ns	
T _r	Turn-on Rise Time			15			
t _{d(OFF)}	Turn-off Delay Time			45			
T _f	Turn-off Fall Time			25			
C _{iss}	Input Capacitance	V _{GS} =0V		520		pF	
C _{oss}	Output Capacitance	V _{DS} =15V		110			
C _{rss}	Reverse Transfer Capacitance	Frequency=1.0MHz		70			

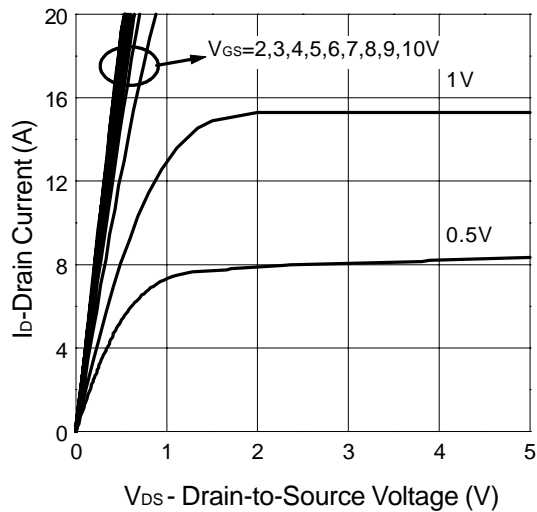
Notes

^a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

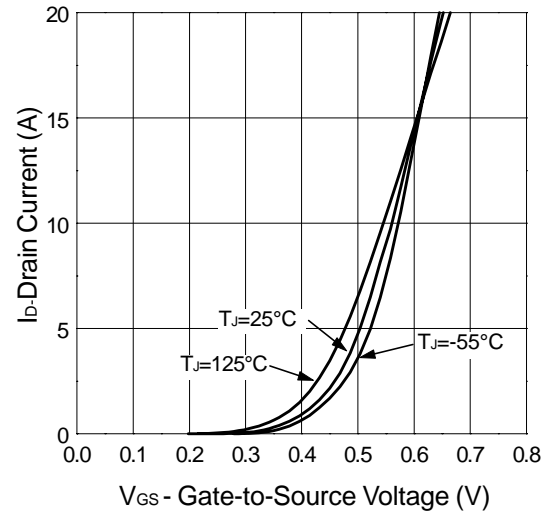
^b : Guaranteed by design, not subject to production testing

Typical Characteristics

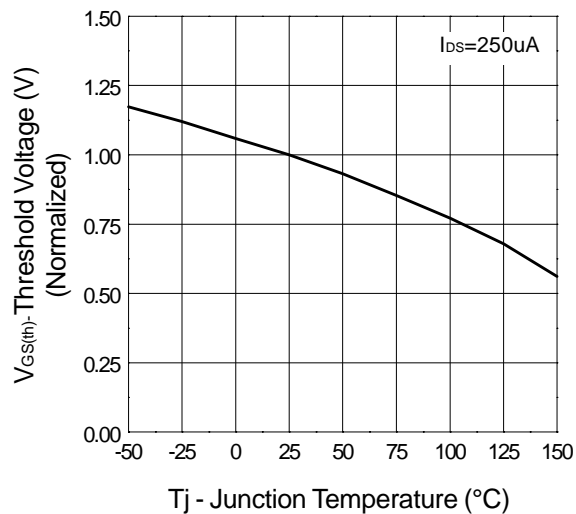
Output Characteristics



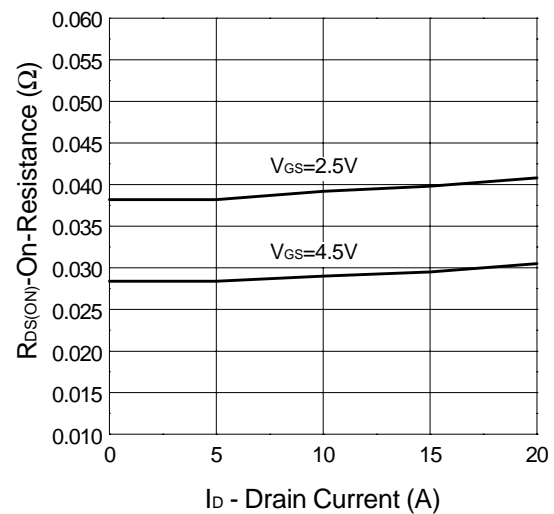
Transfer Characteristics



Threshold Voltage vs. Junction Temperature

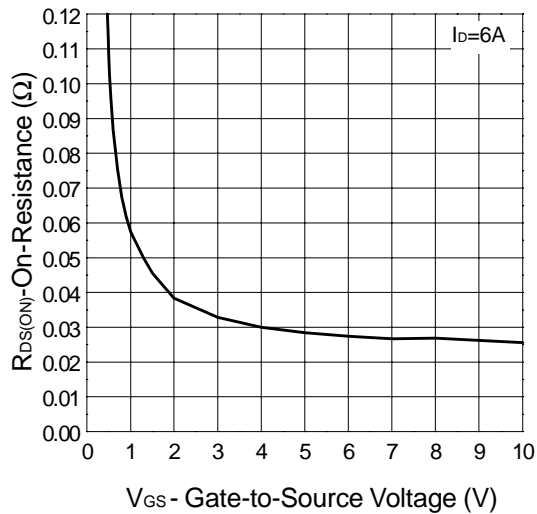


On-Resistance vs. Drain Current

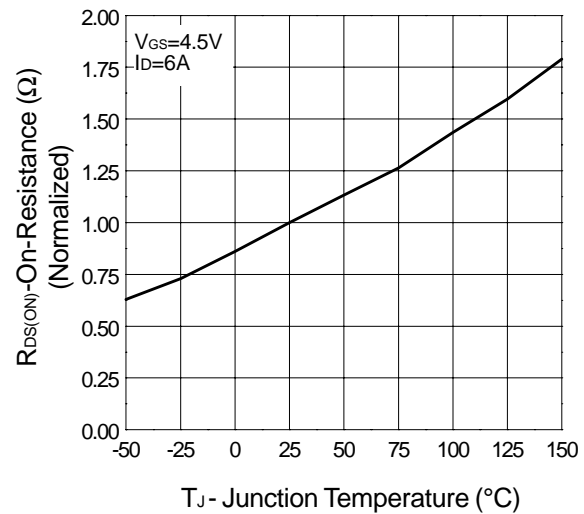


Typical Characteristics (Cont.)

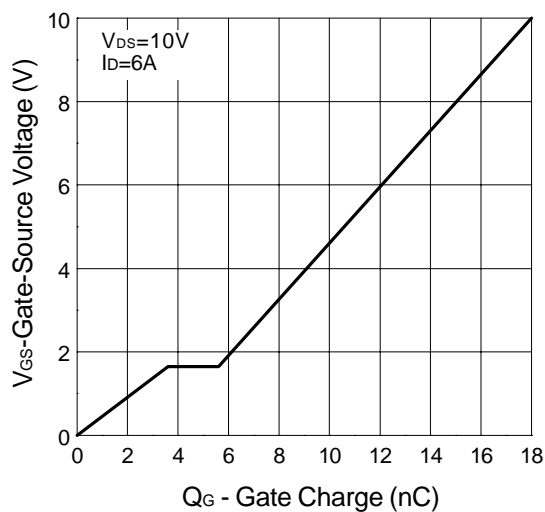
On-Resistance vs. Gate-to-Source Voltage



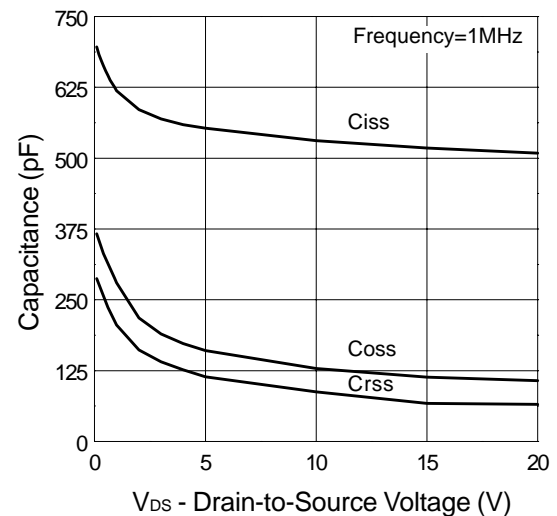
On-Resistance vs. Junction Temperature



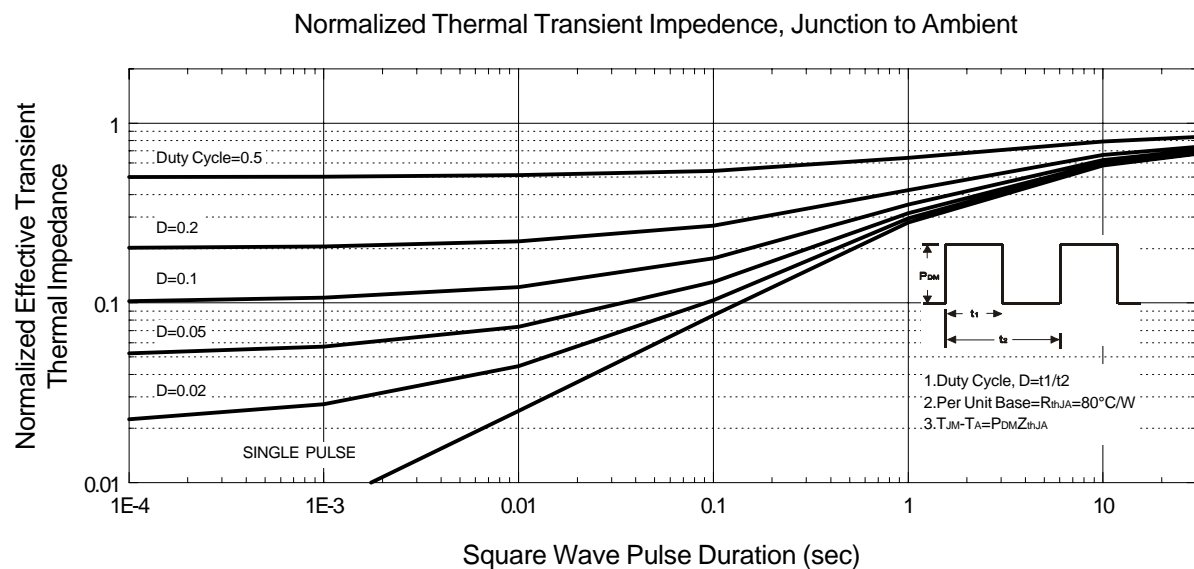
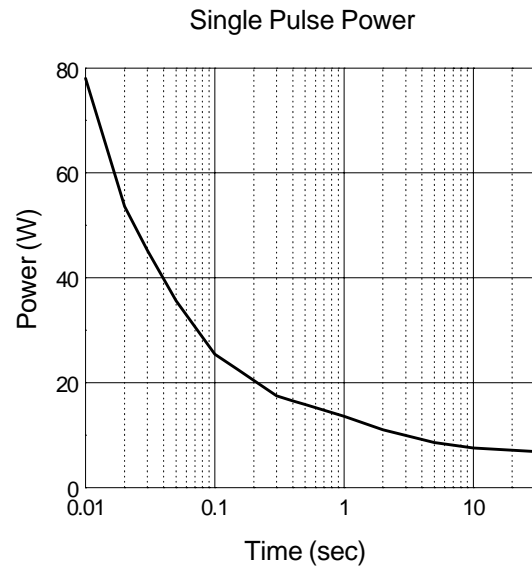
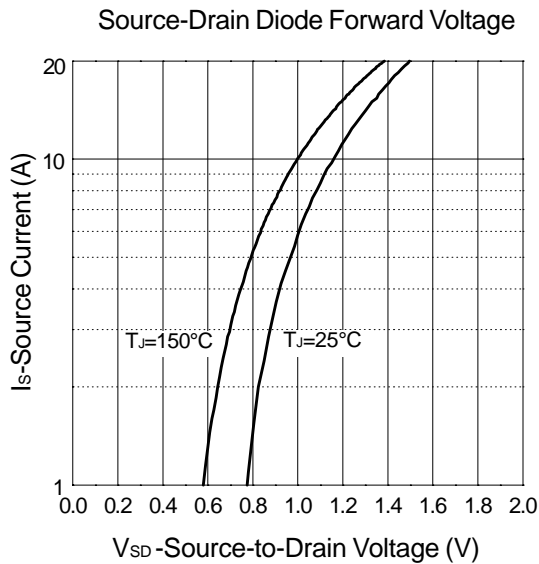
Gate Charge



Capacitance

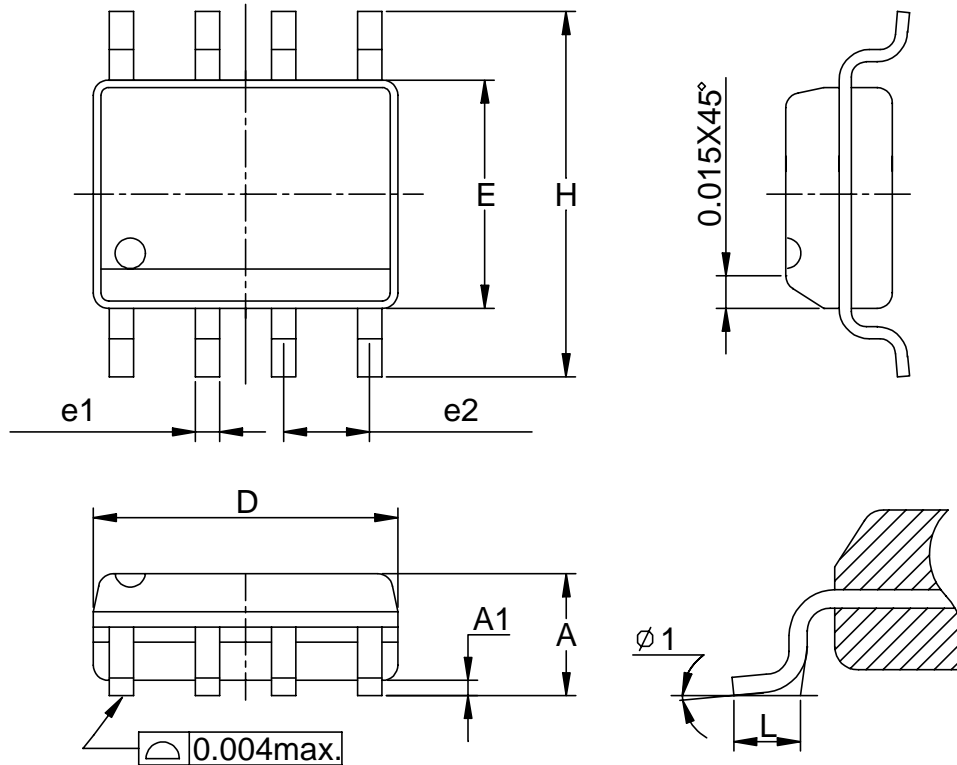


Typical Characteristics (Cont.)



Packaging Information

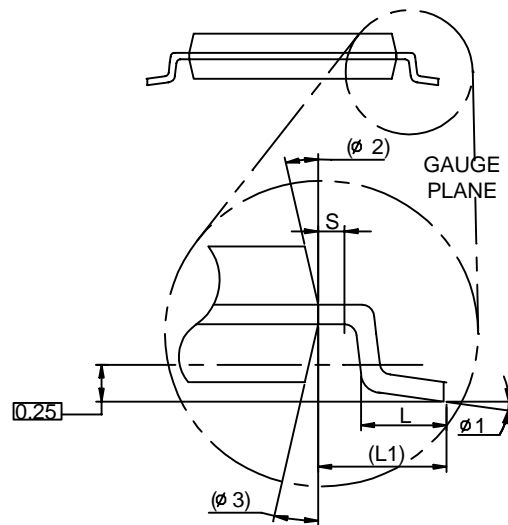
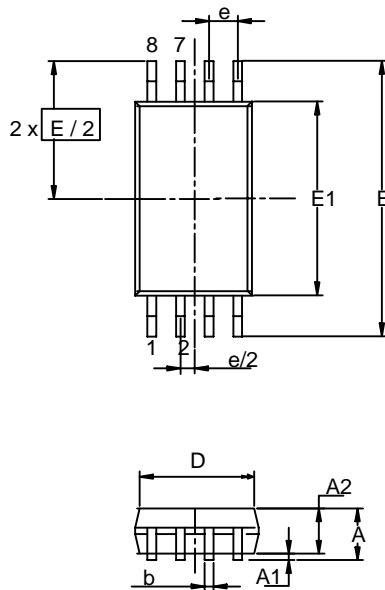
SOP-8 pin (Reference JEDEC Registration MS-012)



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°	

Packaging Information (Cont.)

TSSOP-8

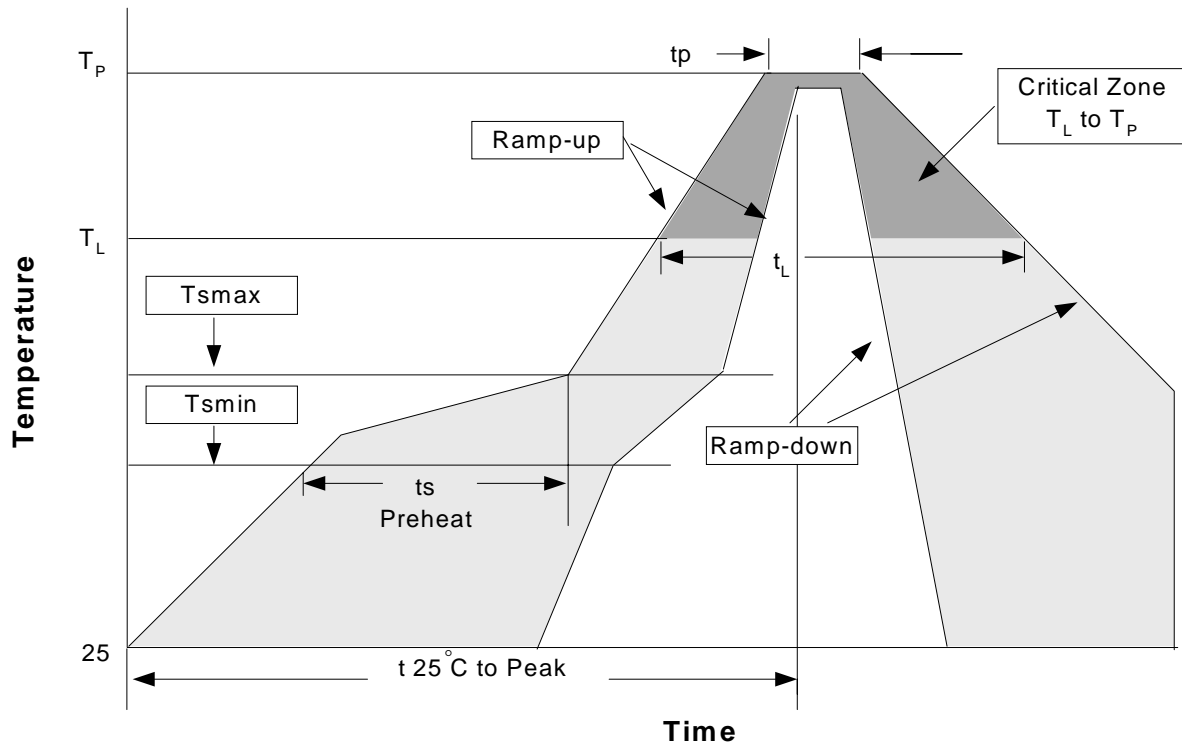


Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		1.2		0.047
A1	0.00	0.15	0.000	0.006
A2	0.80	1.05	0.031	0.041
b	0.19	0.30	0.007	0.012
D	2.9	3.1	0.114	0.122
e	0.65 BSC		0.026 BSC	
E	6.40 BSC		0.252 BSC	
E1	4.30	4.50	0.169	0.177
L	0.45	0.75	0.018	0.030
L1	1.0 REF		0.039 REF	
R	0.09		0.004	
R1	0.09		0.004	
S	0.2		0.008	
phi 1	0°	8°	0°	8°
phi 2	12° REF		12° REF	
phi 3	12° REF		12° REF	

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

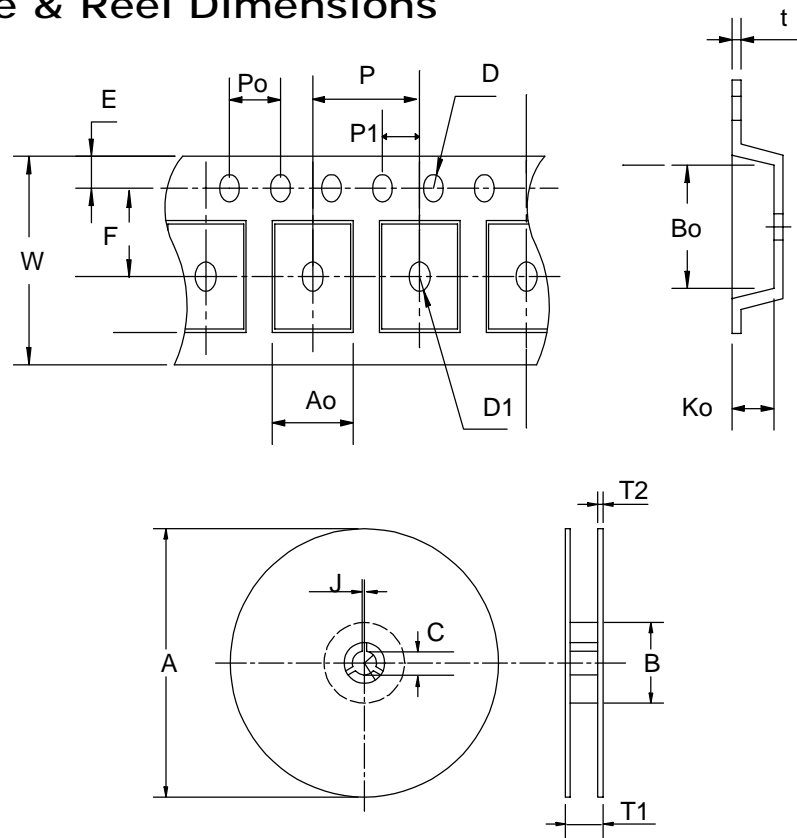
Profile Feature	Sn-Pb Eutectic Assembly		Pb-Free Assembly	
	Large Body	Small Body	Large Body	Small Body
Average ramp-up rate (T _L to T _P)	3°C/second max.		3°C/second max.	
Preheat				
- Temperature Min (T _{min})	100°C		150°C	
- Temperature Mix (T _{max})	150°C		200°C	
- Time (min to max)(ts)	60-120 seconds		60-180 seconds	
T _{max} to T _L				
- Ramp-up Rate			3°C/second max	
T _{max} 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(tp)	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	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	Po	P1	Ao	Bo	Ko	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
Application	A	B	C	J	T1	T2	W	P	E
TSSOP-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	Po	P1	Ao	Bo	Ko	t
	5.5 ± 0.1	1.5 + 0.1	1.5 + 0.1	4.0 ± 0.1	2.0 ± 0.1	7.0 ± 0.1	3.6 ± 0.3	1.6 ± 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
TSSOP- 8	12	9.3	2500

Customer Service

Anpec Electronics Corp.

Head Office :

5F, No. 2 Li-Hsin Road, SBIP,

Hsin-Chu, Taiwan, R.O.C.

Tel : 886-3-5642000

Fax : 886-3-5642050

Taipei Branch :

7F, No. 137, Lane 235, Pac Chiao Rd.,

Hsin Tien City, Taipei Hsien, Taiwan, R. O. C.

Tel : 886-2-89191368

Fax : 886-2-89191369