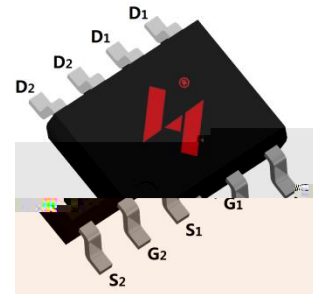


Dual N-Channel Enhancement Mode MOSFET

Feature

- z 30V/11A
- z $R_{DS(ON)}=9.5\text{ m (typ.)}@V_{GS} = 10V$
- z $R_{DS(ON)}=12.5\text{ m (typ.)}@V_{GS} = 4.5V$
- z 100% Avalanche Tested
- z Reliable and Rugged
- z Halogen Free and Green Devices Available (RoHS Compliant)

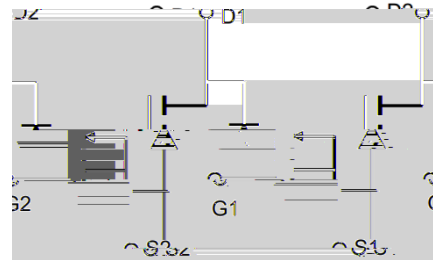
Pin Description



SOP8L

Applications

- z Power Management for DC/DC
- z Switching Application
- z Wireless Power



Dual N-Channel MOSFET

Ordering and Marking Information

	<p>Package Code S: SOP8L</p> <p>Date Code XXXYWXXXXX</p>
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Note:HUAYI lead-free products contain molding compounds/die attach materials and 100% matte tin plate Termination finish; which are fully compliant with RoHS. HUAYI lead-free products meet or exceed the lead-free requirements of IPC/JEDEC J-STD-020 for MSL classification at lead-free peak reflow temperature. HUAYI defines 'Green' to mean lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight).

HUAYI reserves the right to make changes, corrections, enhancements, modifications, and improvements to this product and/or to this document at any time without notice.

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (Tc=25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		30	V
V _{GSS}	Gate-Source Voltage		±20	V
T _J	Junction Temperature Range		-55 to 150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Source Current-Continuous(Body Diode)	Tc=25°C	11	A
Mounted on Large Heat Sink				
I _{DM}	Pulsed Drain Current *	Tc=25°C	44	A
I _D	Continuous Drain Current	Tc=25°C	11	A
		Tc=70°C	8.8	A
P _D	Maximum Power Dissipation	Tc=25°C	2.5	W
		Tc=70°C	1.6	W
R _{θJC}	Thermal Resistance, Junction-to-Case		50	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient		80	°C/W
E _{AS}	SinglePulsed-Avalanche Energy **	L=0.1mH	12	mJ

Note: * Repetitive rating pulse width limited by max.junction temperature.

** Limited by T_{Jmax}, starting T_J=25°C, L = 0.1mH, R_G= 25 Ω, V_{GS}=10V.

Electrical Characteristics (Tc =25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	HYG080ND03LA1			Unit
			Min	Typ.	Max	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250 A	30	-		V
I _{DSS}	Drain-to-Source LeakageCurrent	V _{DS} =30V, V _{GS} =0V	-	-	1	A
		T _J =125°C	-	-	50	A
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 A	1	1.6	3	V
I _{GSS}	Gate-Source Leakage Current	V _{GS} = 20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)*}	Drain-Source On-State Resistance	V _{GS} =10V, I _{DS} =10A	-	9.5	13	m
		V _{GS} =4.5V, I _{DS} =5A		12.5	16	
Diode Characteristics						
V _{SD*}	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	-	0.7	1.0	V
t _{rr}	Reverse Recovery Time	I _{SD} =10A, dI _{SD} /dt=100A/ V	-	15	-	ns
Q _{rr}	Reverse Recovery Charge		-	35	-	nC

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Electrical Characteristics (Cont.) (Tc =25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	HYG080ND03LA1			Unit
			Min	Typ.	Max	
Dynamic Characteristics						
t_{d}	$t_{\text{d}}(\text{V}_{\text{DD}} \rightarrow \text{V}_{\text{SS}})$	$V_{\text{DD}} = 1.8\text{V}$ TP:	0	0	0	ns
t_{r}	$t_{\text{r}}(\text{V}_{\text{DD}} \rightarrow \text{V}_{\text{SS}})$	$V_{\text{DD}} = 1.8\text{V}$	0	680	0	
t_{f}	$t_{\text{f}}(\text{V}_{\text{DD}} \rightarrow \text{V}_{\text{SS}})$	$V_{\text{DD}} = 1.5\text{V}$	0	150	0	
t_{p}	$t_{\text{p}}(\text{V}_{\text{DD}} \rightarrow \text{V}_{\text{SS}})$	$V_{\text{DD}} = 1.8\text{V}$ TP:	0	70	0	
$t_{\text{C}}(\text{PD})$	$t_{\text{C}}(\text{PD})$	$V_{\text{DD}} = 1.8\text{V}$ $V_{\text{SS}} = 0\text{V}$	0	4.8	0	ns
$t_{\text{C}}(\text{I})$	$t_{\text{C}}(\text{I})$		0	12.5	0	
$t_{\text{C}}(\text{U})$	$t_{\text{C}}(\text{U})$		0	27.6	0	
$t_{\text{C}}(\text{V})$	$t_{\text{C}}(\text{V})$		0	8.2	0	
Gate Charge Characteristics						
$t_{\text{G}}(\text{V}_{\text{DD}})$	$t_{\text{G}}(\text{V}_{\text{DD}})$	6	0	1.5	0	ns
$t_{\text{G}}(\text{V}_{\text{SS}})$	$t_{\text{G}}(\text{V}_{\text{SS}})$		0	8.5	0	
$t_{\text{G}}(\text{V}_{\text{DD}})$	$t_{\text{G}}(\text{V}_{\text{DD}})$		0		0	
$t_{\text{G}}(\text{V}_{\text{SS}})$	$t_{\text{G}}(\text{V}_{\text{SS}})$		0	1.5	0	

Symbol: t_{d} , t_{r} , t_{f} , t_{p} , $t_{\text{C}}(\text{PD})$, $t_{\text{C}}(\text{I})$, $t_{\text{C}}(\text{U})$, $t_{\text{C}}(\text{V})$, $t_{\text{G}}(\text{V}_{\text{DD}})$, $t_{\text{G}}(\text{V}_{\text{SS}})$

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Typical Operating Characteristics

Figure 1: Power Dissipation

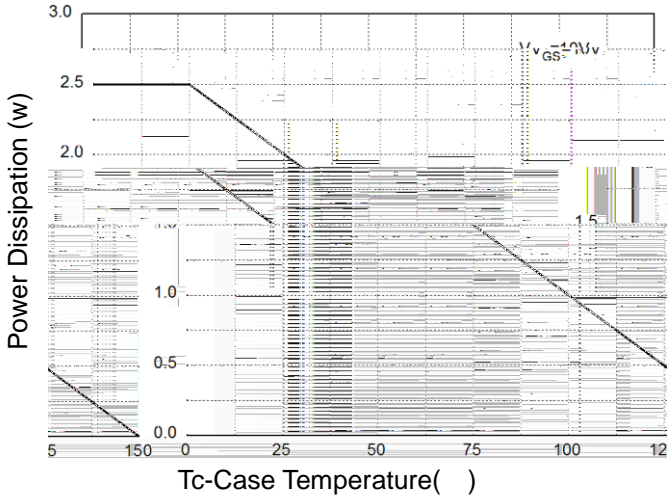


Figure 2: Drain Current

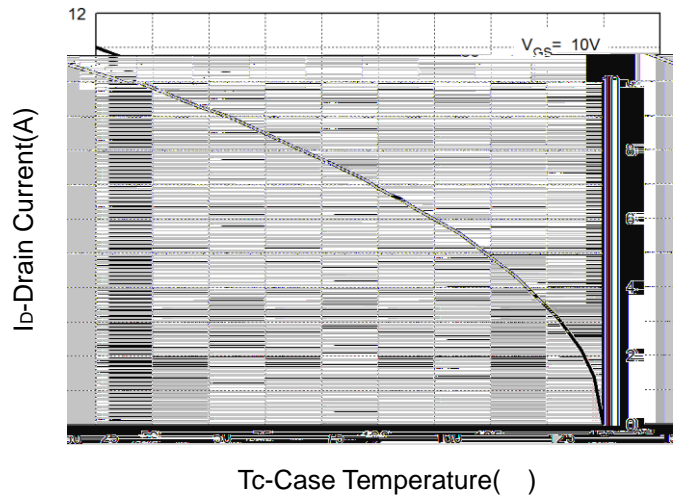


Figure 3: Safe Operation Area

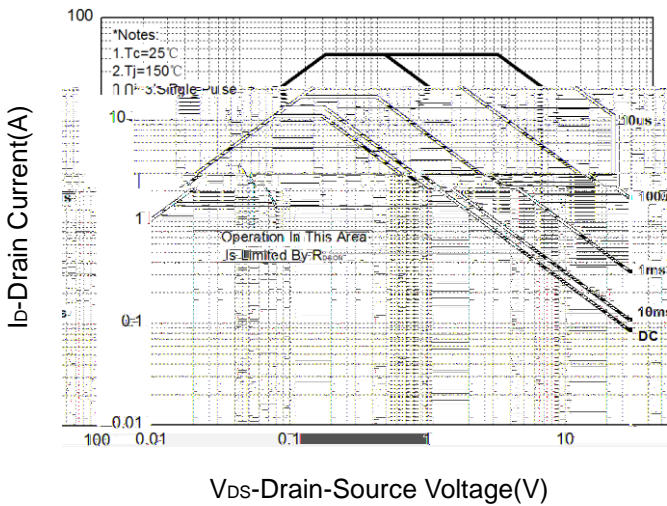


Figure 4: Thermal Transient Impedance

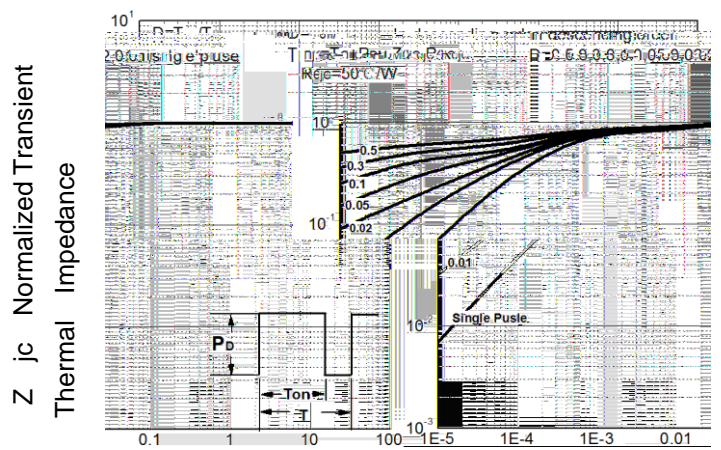


Figure 5: Output Characteristics

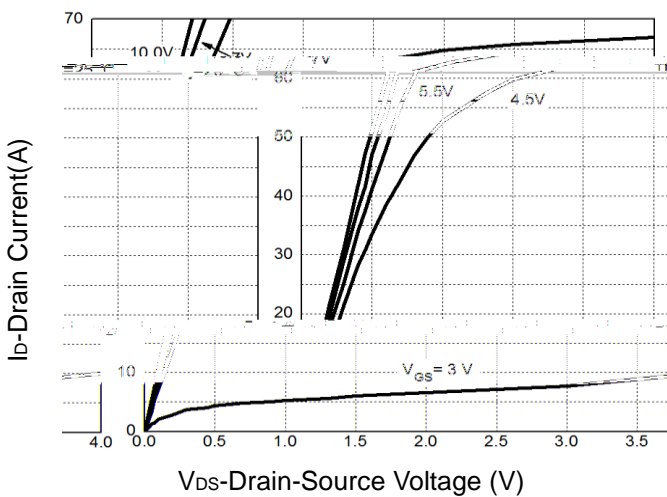
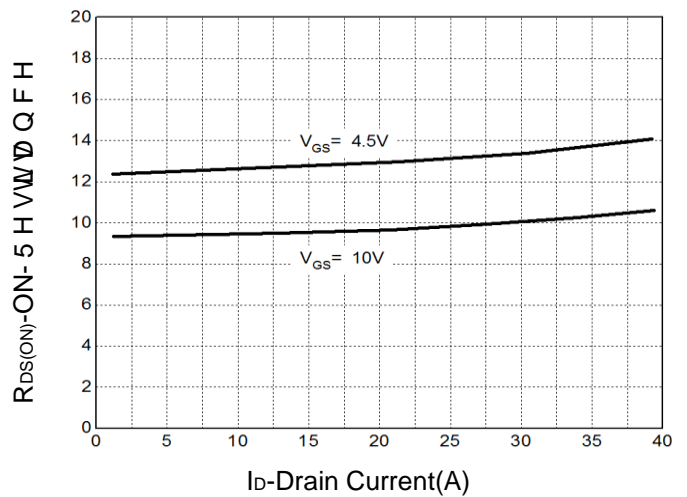


Figure 6: Drain-Source On Resistance

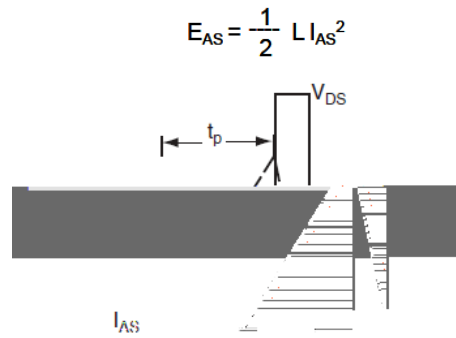
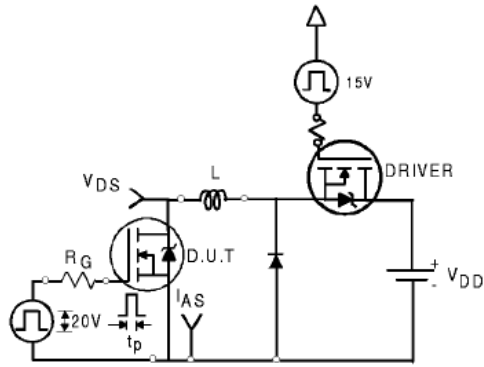


Typical Operating Characteristics

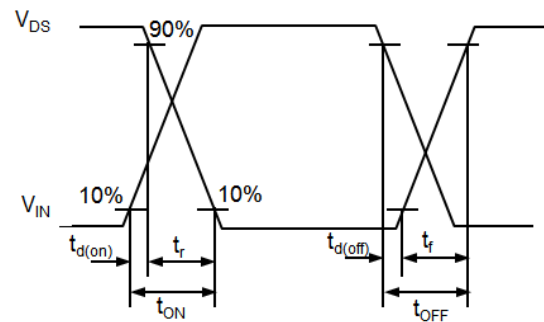
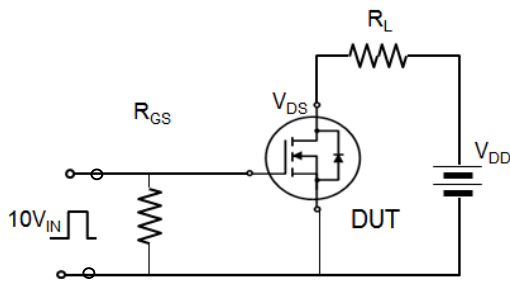
Figure 7 : On

HYG080ND03LA1S

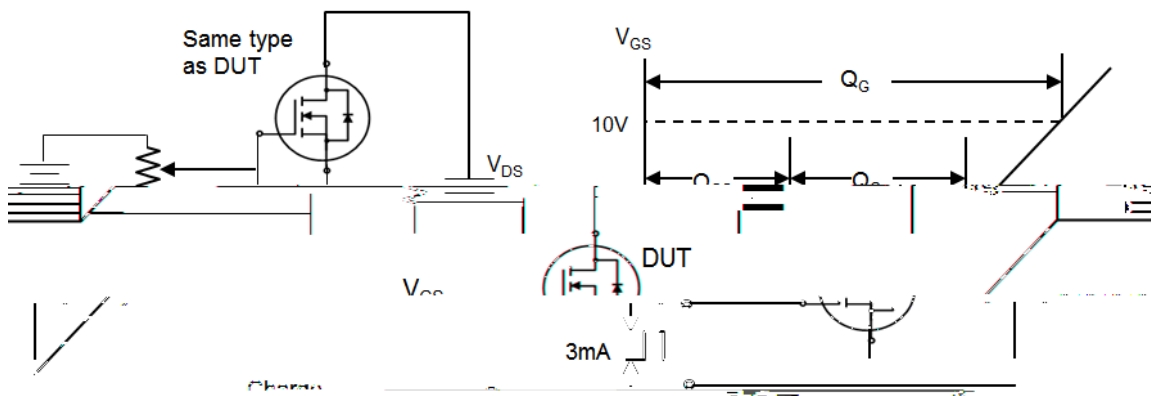
Avalanche Test Circuit



Switching Time Test Circuit



Gate Charge Test Circuit



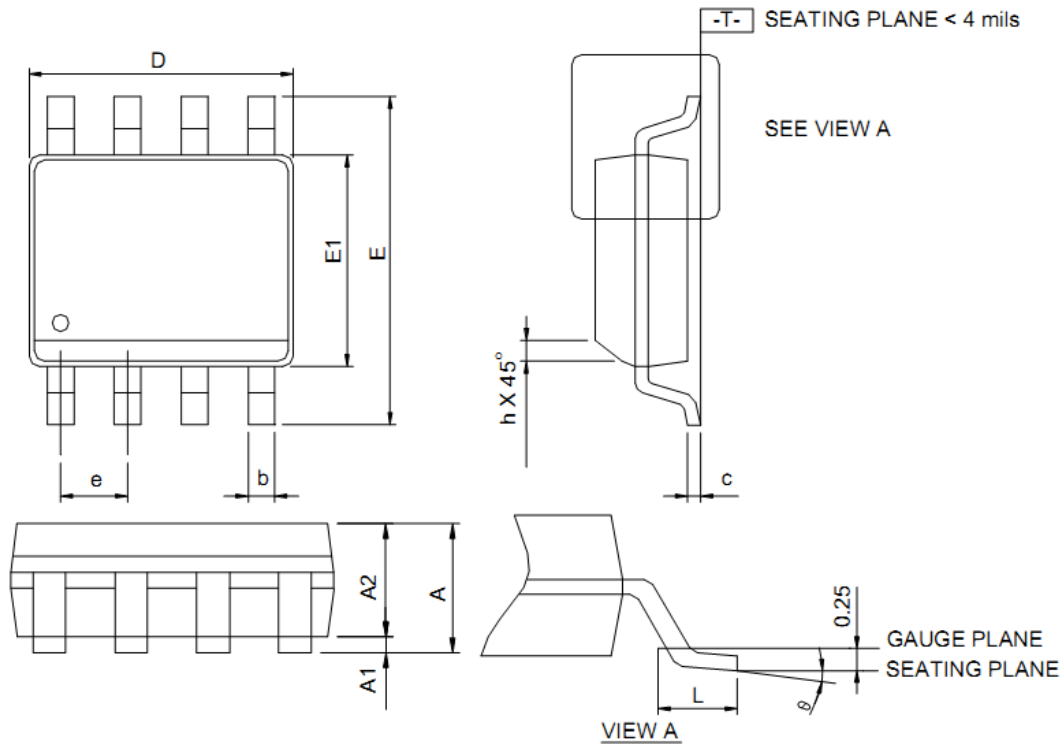
HYG080ND03LA1S

Device Per Unit

Package Type	Unit	Quantity
SOP8L	Reel	2500

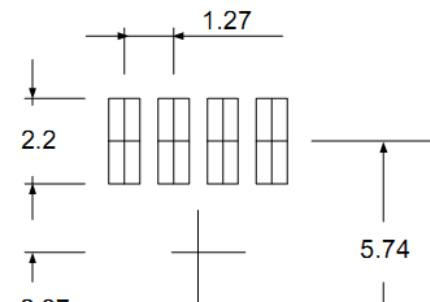
Package Information

SOP8L



DIMENSION	SOP8L			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.75	-	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	-	0.049	-
b	0.31	0.51	0.012	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	5.80	6.20	0.228	0.244

RECOMMENDED LAND PATTERN



E1	3.80	4.00	0.150	0.07	0.157	4.80
e	1.27 BSC		0.050 BSC			
h	0.25	0.50	0.010	0.020		
L	0.40	1.27	0.016	0.050		
theta	0°	8°	0°	8°		0.635

2. Dimension D does not include inter-lead flash or protrusions on gage plane.

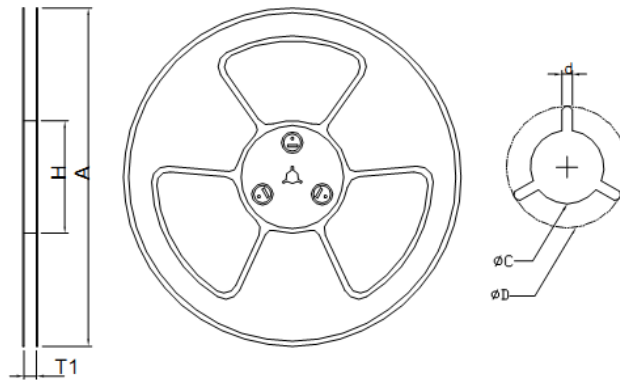
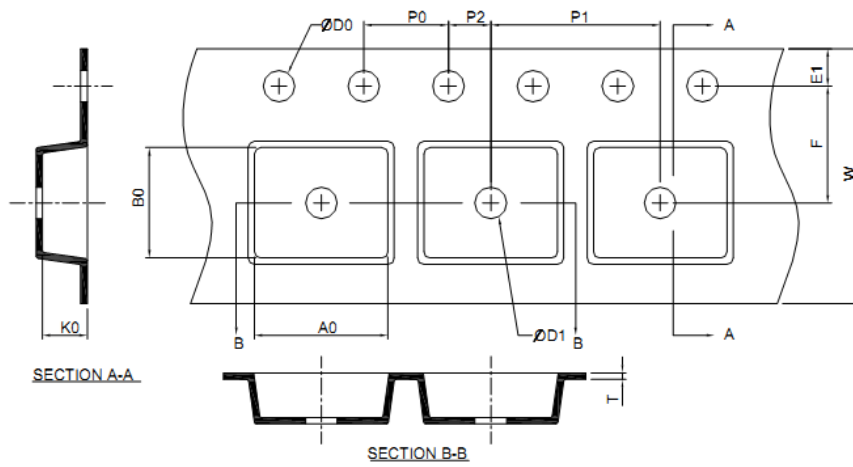
Inter-lead flash and protrusions shall not exceed 6 mil per side.

3. Dimension E does not include inter-lead flash or protrusions.

Inter-lead flash and protrusions shall not exceed 10 mil per side.

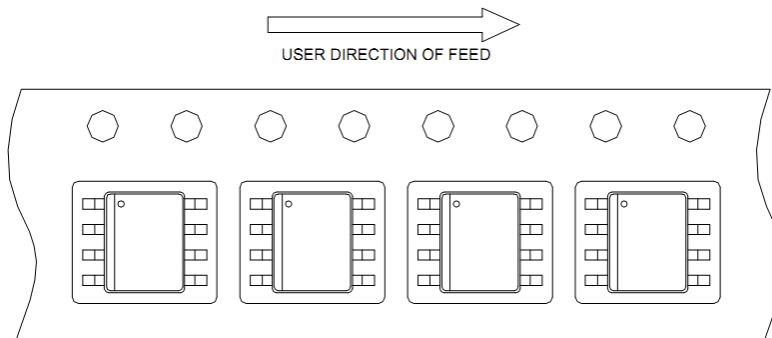
HYG080ND03LA1S

Carrier Tape & Reel Dimensions



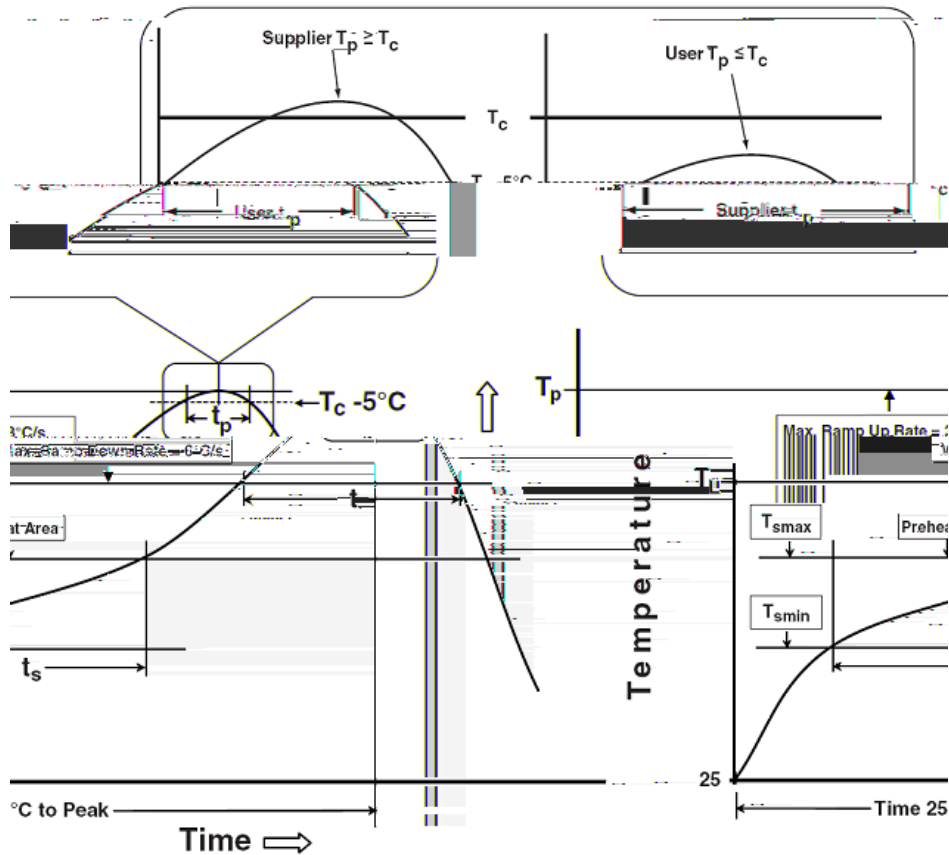
Application	A	H	T1	C	D	W	F1	F	
SOP8L	1.5 MIN.	0.6 ^{+0.00} _{-0.40}	6.40 0.20	5.20 0.20	2.10 0.20	4.0 0.10	8.0 0.10	2.0 0.05	1.5 ^{+0.1} _{-0.0}
(mm)									

Taping Direction Information



HYG080ND03LA1S

Classification Profile



Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat & Soak		
Temperature min (T_{smin})	100 °C	150 °C
Temperature max (T_{smax})	150 °C	200 °C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max.	3°C/second max.
Liquidous temperature (T_L)	183 °C	217 °C
Time at liquidous (t_L)	60-150 seconds	60-150 seconds
Peak package body Temperature (T_p)*	See Classification Temp in table 1	See Classification Temp in table 2
Time (t_p)** within 5°C of the specified classification temperature (T_c)	20** seconds	30** seconds
Average ramp-down rate (T_p to T_{smax})	6 °C/second max.	6 °C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.
*Tolerance for peak profile Temperature (T_p) is defined as a supplier minimum and a user maximum.		
** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.		

HYG080ND03LA1S

Table 1. SnPb Eutectic Process ±Classification Temperatures (Tc) a

Package Thickness	Volume mm	Volume mm
	<350	350