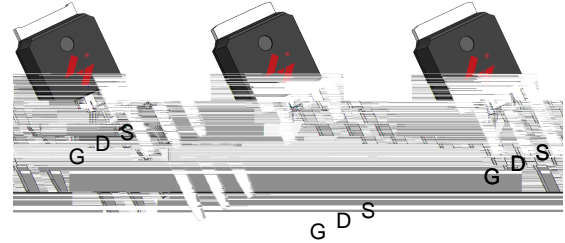


## N-Channel Enhancement Mode MOSFET

### Feature

- 70V/70A  
 $R_{DS(ON)} = 7.4 \Omega(\text{typ.}) @ V_{GS} = 10V$
- 100% Avalanche Tested
- Reliable and Rugged
- Halogen Free and Green Devices Available  
 (RoHS Compliant)

### Pin Description



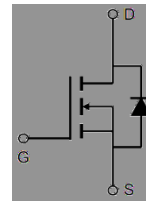
TO-252-2L

TO-251-3L

TO-251-3S




### Applications

- Power Management for Inverter Systems



N-Channel MOSFET

### Ordering and Marking Information

 D <b>HY1001</b> XYMXXXXXX	 U <b>HY1001</b> XYMXXXXXX	 V <b>HY1001</b> XYMXXXXXX	Package Code D: TO-252-2L    U: TO-251-3L    V: TO-251-3S  Date Code XYMXXXXXX
---	---	---	--

Note: HUAYI lead-free products contain no soldering 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
<b>Common Ratings</b> (Tc=25°C Unless Otherwise Noted)				
V <sub>DSS</sub>	Drain-Source Voltage		70	V
V <sub>GSS</sub>	Gate-Source Voltage		±20	V
T <sub>J</sub>	Junction Temperature Range		-55 to 175	°C
T <sub>STG</sub>	Storage Temperature Range		-55 to 175	°C
I <sub>S</sub>	Source Current-Continuous(Body Diode)	Tc=25°C	70	A
<b>Mounted on Large Heat Sink</b>				
I <sub>DM</sub>	Pulsed Drain Current *	Tc=25°C	270	A
I <sub>D</sub>	Continuous Drain Current	Tc=25°C	70	A
		Tc=100°C	49.5	A
P <sub>D</sub>	Maximum Power Dissipation	Tc=25°C	75	W
		Tc=100°C	37.5	W
R <sub>θJC</sub>	Thermal Resistance, Junction-to-Case		2	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient **		110	°C/W
E <sub>AS</sub>	Single Pulsed-Avalanche Energy ***	L=0.3 μs	205	J

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

\*\* Surface mounted on FR-4 board.

\*\*\* Limited by T<sub>J</sub> max, starting T<sub>J</sub>=25°C, L = 0.3 μs, R<sub>G</sub>= 25Ω, V<sub>GS</sub> =10V.

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

Symbol	Parameter	Test Conditions	HY1001			Unit
			Min	Typ.	Max	
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V				

# HY1001D/U/V

---

## Electrical Characteristics (Cont.) (T<sub>c</sub> =25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	HY1001			Unit
			Min	Typ.	Max	

**Dynamic Characteristics**

R<sub>G</sub> Gate Resist e



### Operating Characteristics

Fig re 1: Power Dissipation

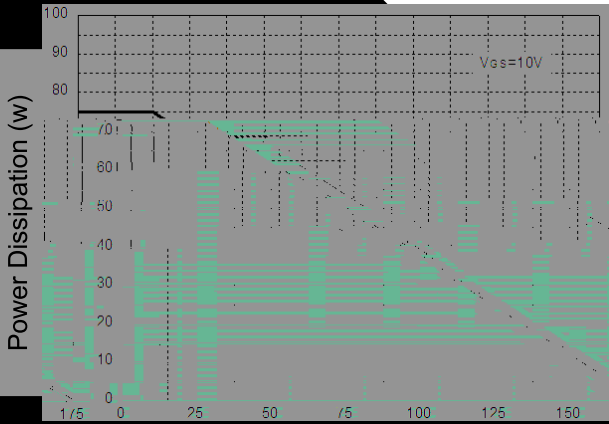


Fig re 2: Drain Current

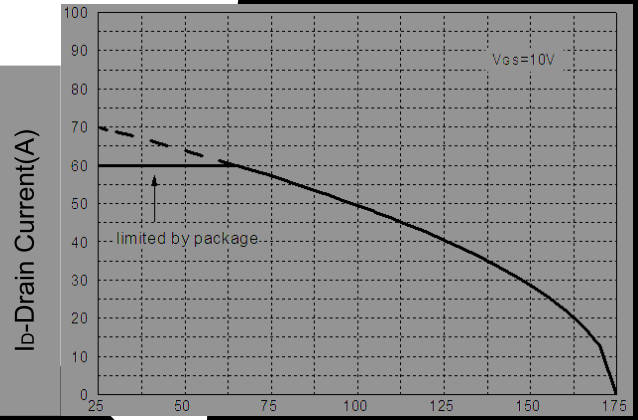
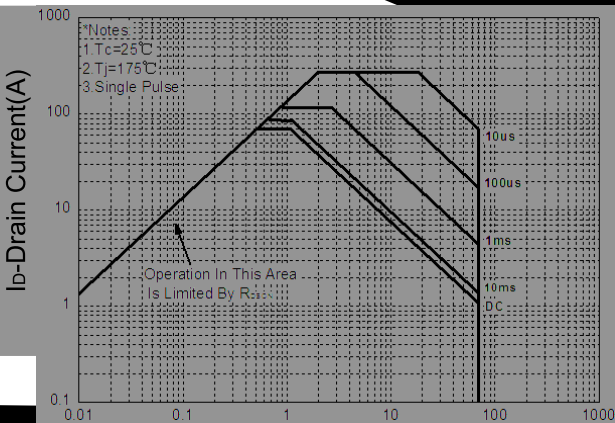
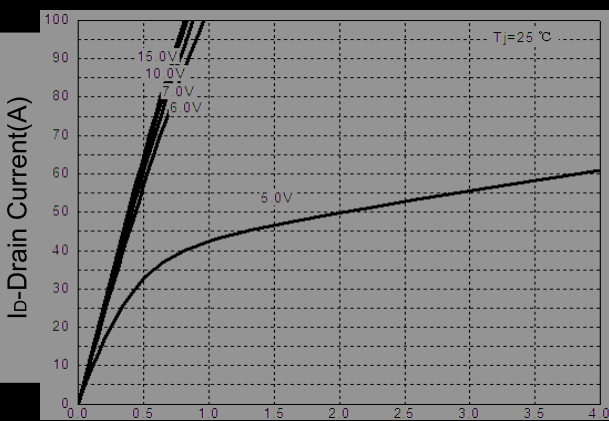
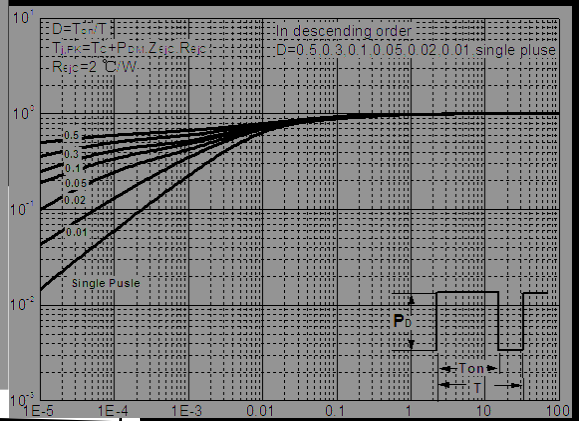


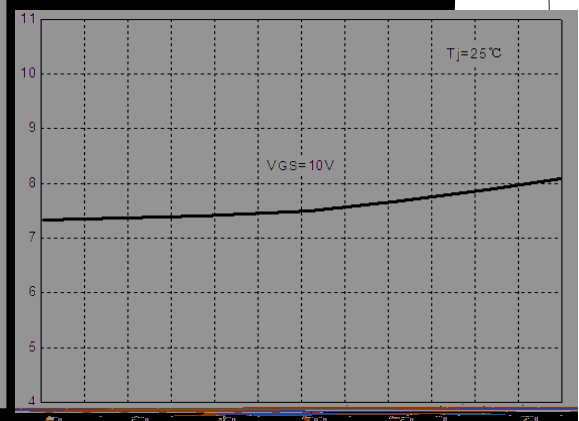
Fig re 3: Safe Operating Area



Zjc Normalized Transient Thermal Impedance (°C/W)

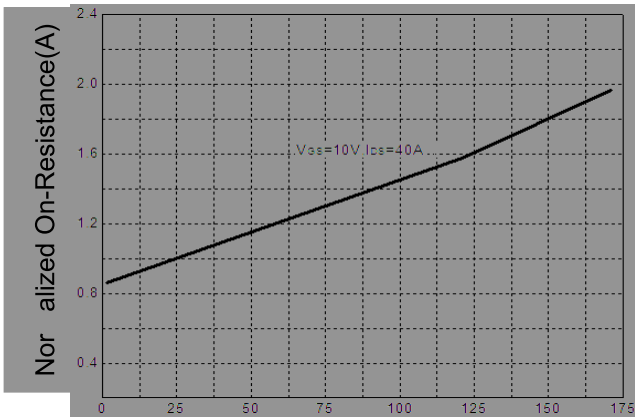


Rds(on)-ON-Resistance(Ω)



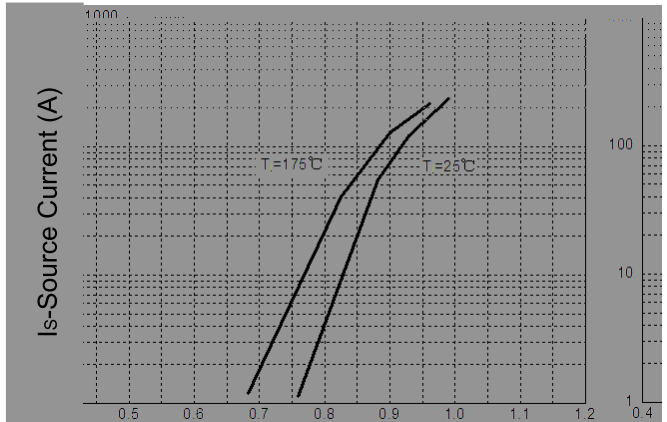
**Typical Operating Characteristics(Cont.)**

**Fig re 7: On-Resistance vs. Temperature**



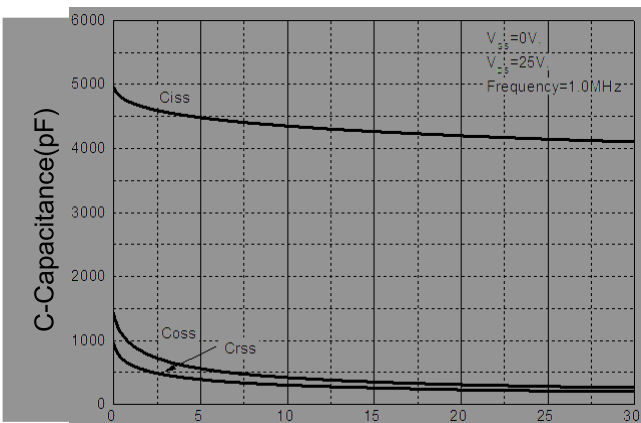
Tj-Junction Temperature (°C)

**Fig re 8: Source-Drain Diode Forward**



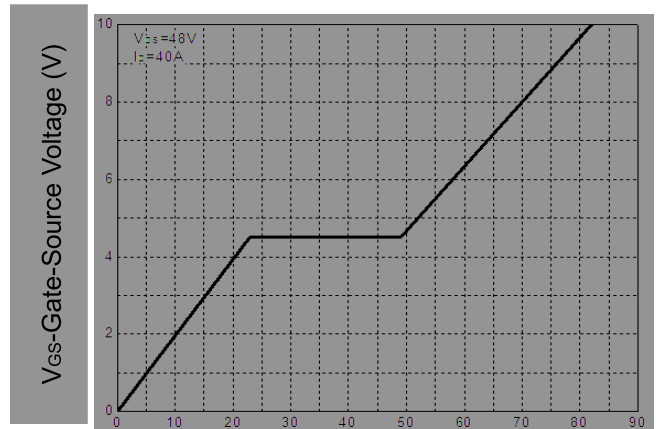
Vsd-Source-Drain Voltage(V)

**Fig re 9: Capacitance Characteristics**



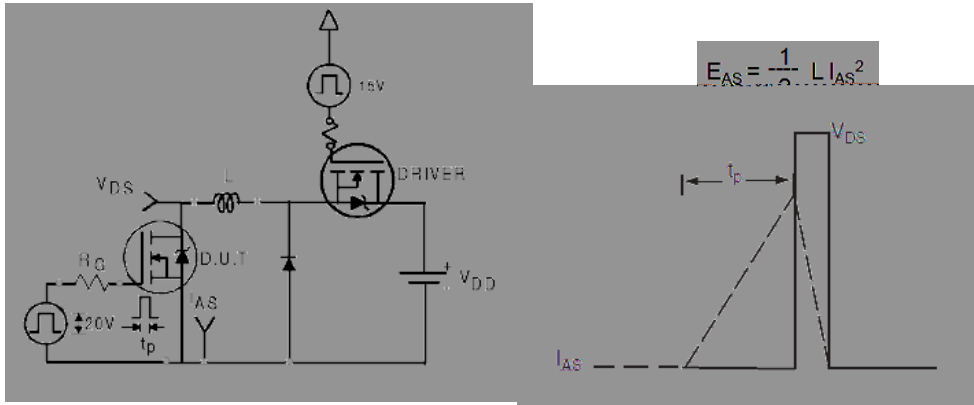
Vds-Drain-Source Voltage (V)

**Fig re 10: Gate Charge Characteristics**

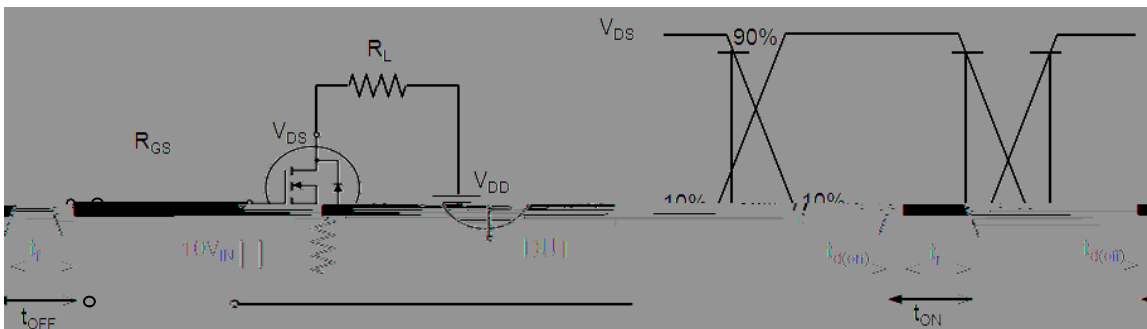


Qg-Gate Charge (nC)

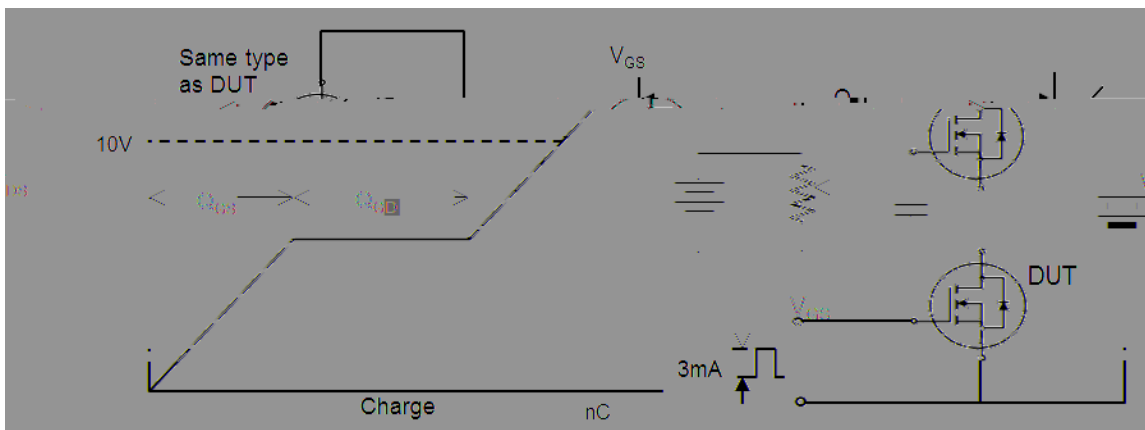
### Avalanche Test Circuit



### Switching Time Test Circuit



### Gate Charge Test Circuit



**Device Per Unit**

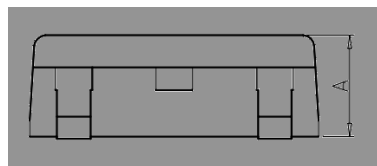
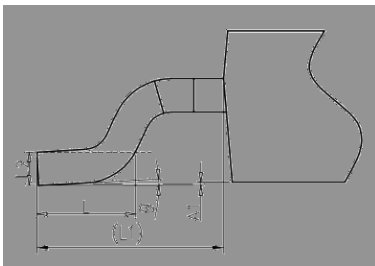
Package Type	Unit	Q antity
TO-252-2L	Tube	75
TO-252-2L	Reel	2500
TO-251-3L	Tube	75
TO-251-3S	Tube	75

**Package Information**

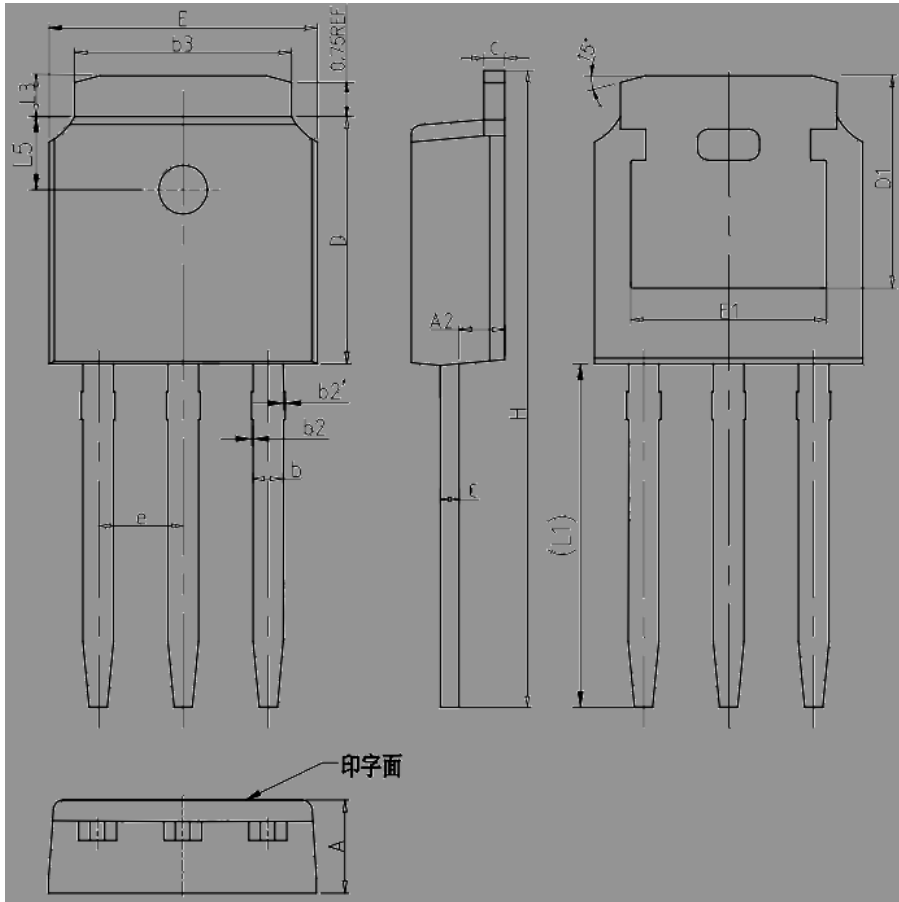
TO-252-2L

COMMON DIMENSIONS

SYMBOL	MIN	NOM	MAX
	A	2.20	2.30
A1	0.00	-	0.20
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.80
E1	4.63	-	-
e	2.286BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88	-	1.28
L4	-	-	1.00
L5	1.65	1.80	1.95
θ	0°	-	8°



TO-251-3L

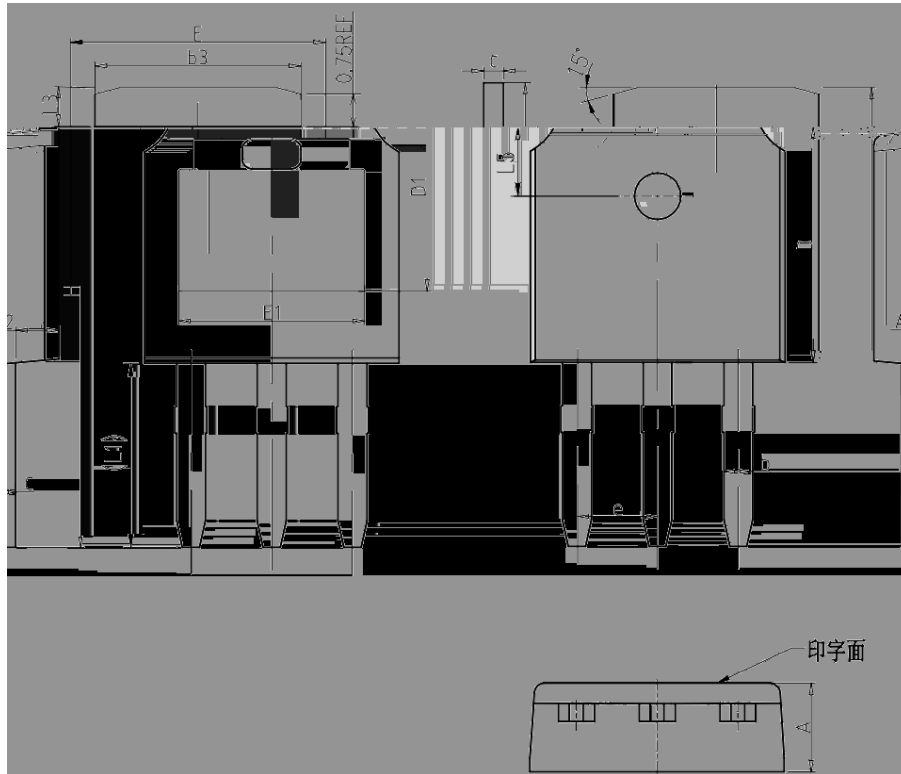


COMMON DIMENSIONS

SYMBOL			
	MIN	NOM	MAX
A	2.20	2.30	2.40
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b2	0.00	0.04	0.10
b2'	0.00	0.04	0.10
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.80
E1	4.63	-	-
e	2.286BSC		
H	16.22	16.52	16.82
L1	9.15	9.40	9.65
L3	0.88	1.02	1.28
L5	1.65	1.80	1.95



TO-251-3S



COMMON DIMENSIONS

SYMBOL			
	MIN	NOM	MAX
A	2.20	2.30	2.40
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.80
E1	4.63	-	-
e	2.286BSC		
H	10.00	11.22	11.44
L1	3.90	4.10	4.30
L3	0.88	1.02	1.28
L5	1.65	1.80	1.95



Table 1. SnPb Eutectic Process – Classification Temperatures (Tc)

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5	235 °C	220 °C
≥2.5	220 °C	220 °C

Table 2. Pb-free Process – Classification Temperatures (Tc)

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> ≥2000
<1.6	260 °C	260 °C	260 °C
1.6 – 2.5	260 °C	250 °C	245 °C
≥2.5	250 °C	245 °C	245 °C

## Reliability Test Program

Test item	Method	Description
SOLDERABILITY	JESD-22, B102	5 Sec, 245°C
HTRB	JESD-22, A108	168 Hrs/500 Hrs/1000Hrs, Bias@150°C
PCT	JESD-22, A102	96 Hrs, 100%RH, 2atm, 121°C
TCT	JESD-22, A104	250/500/000 Cycles, -55°C~150°C

### Customer Service

Worldwide Sales and Service: sales@hyexa.co

Technical Support: Technology@hyexa.co

Huayi Microelectronics Co., Ltd.

No.8928, Shangji Road, Economic and Technological Development Zone, Xi'an, China

TEL: (86-029) 86685706

FAX: (86-029) 86685705

E-mail: sales@hyexa.co

Web net: www.hyexa.co