

# HY3008P/M/B/ MF /PL/PM

---

N-Channel Enhancement Mode MOSFET

## Feature

## Pin Description

80V/100A  
 $R_{DS(ON)} = 6.6m \text{ (typ.)}@V_{GS}$

TO-3PM-3L

YYXXX WW

G:Lead Free

Note: HUAYI lead

ation finish;which are fully compliant with RoHS. HUAYI lead

free peak reflow temperature. HUAYI defines

HUAYI

# HY3008P/M/B/ MF /PL/PM

## Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
<b>Common Ratings</b> (Tc=25°C Unless Otherwise Noted)				
V <sub>DSS</sub>	Drain-Source Voltage		80	V
V <sub>GSS</sub>	Gate-Source Voltage		±25	V
T <sub>J</sub>	Maximum Junction Temperature		-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	100	A
<b>Mounted on Large Heat Sink</b>				
I <sub>DM</sub>	Pulsed Drain Current *	Tc=25°C	400**	A
I <sub>D</sub>	Continuous Drain Current	Tc=25°C	100	A
		Tc=100°C	70	A
P <sub>D</sub>	Maximum Power Dissipation	Tc=25°C	200	W
		Tc=100°C	100	W
	Case		0.75	°C/W
R <sub>ΘJA</sub>	Thermal Resistance, Junction-to-Ambient **		62.5	°C/W
E <sub>AS</sub>	SinglePulsed-Avalanche Energy ***	L=0.3 mH	407***	mJ

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

\*\* Surface mounted on 1in2 FR-4 board.

\*\*\* Limited by T<sub>Jmax</sub>, starting T<sub>J</sub>=25°C, L = 0.3mH, R<sub>C</sub>= 25 , V<sub>GS</sub>=10V.

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

Symbol	Parameter	Test Conditions	HY3008			Unit
			Min	Typ.	Max	
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> = 250 A	80	-	-	V
I <sub>DSS</sub>	Drain-to-Source Leakage Current	V <sub>DS</sub> = 80V, V <sub>GS</sub> =0V	-	-	1	A
		T <sub>J</sub> =125°C	-	-	50	A
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> = 250 A	2	3	4	V
I <sub>GSS</sub>						

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

Symbol	Parameter	Test Conditions	HY3008			Unit
			Min	Typ.	Max	
<b>Dynamic Characteristics</b>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	-	1.0	-	
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> = 25V, Frequency=1.0MHz	-	3150	-	pF
C <sub>oss</sub>	Output Capacitance					
C <sub>rss</sub>	Reverse Transfer Capacitance					
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> = 40V, R <sub>G</sub> =3 Ω, I <sub>DS</sub> = 50A, V <sub>GS</sub> = 10V	-	23	-	ns
T <sub>r</sub>	Turn-on Rise Time					
t <sub>d(OFF)</sub>	Turn-off Delay Time					
T <sub>f</sub>	Turn-off Fall Time					
<b>Gate Charge Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = 64V, V <sub>GS</sub> = 10V, I <sub>DS</sub> = 50A	-	67	-	nC
Q <sub>gs</sub>	Gate-Source Charge					
Q <sub>gd</sub>	Gate-Drain Charge					

Note: \*Pulse test pulse width 300us duty cycle 2%

# HY3008P/M/B/ MF /PL/PM

---

## Typical Operating Characteristics

**Figure 1: Power Dissipation**

**Figure 2: Drain Current**

Tc-Case Temperature( )

Tc-Case Temperature( )

**Figure 3: Safe Operation Area**

**Figure 4: Thermal Transient Impedance**

I<sub>D</sub>-Drain Current(A)

I<sub>D</sub>-Drain Current(A)

V<sub>DS</sub>-Drain-Source Voltage(V)

Maximum Effective Transient Thermal Impedance, Junction-to-Case

**Figure 5: Output Characteristics**

**Figure 6: Drain-Source On Resistance**

I<sub>D</sub>-Drain Current(A)

V<sub>DS</sub>-Drain-Source Voltage (V)

I<sub>D</sub>-Drain Current(A)

Typical Operating Characteristics(Cont.)

Figure 7: On-Resistance vs. Temperature

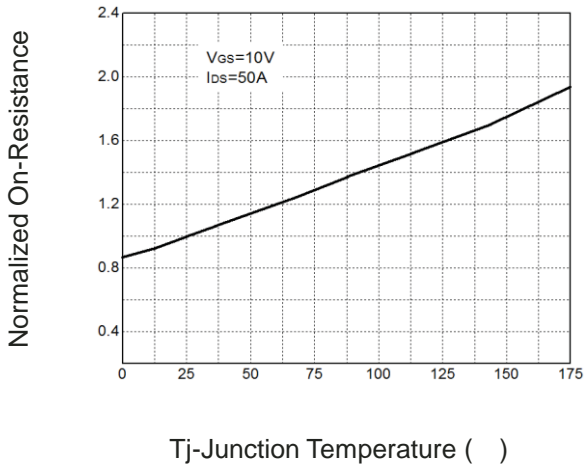


Figure 8: Source-Drain Diode Forward

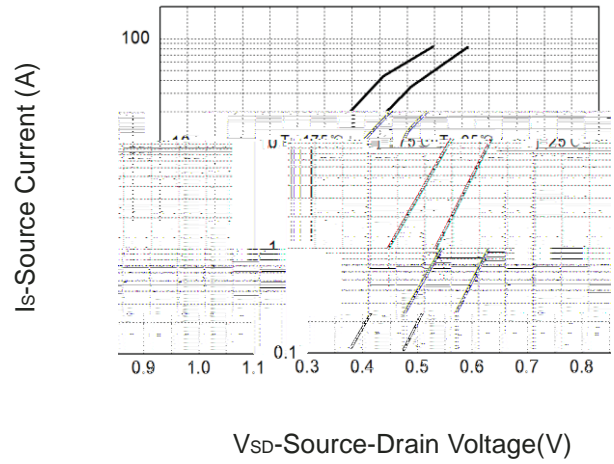


Figure 9: Capacitance Characteristics

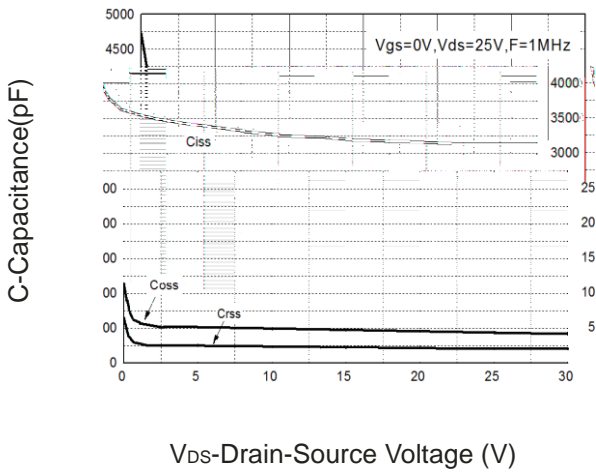
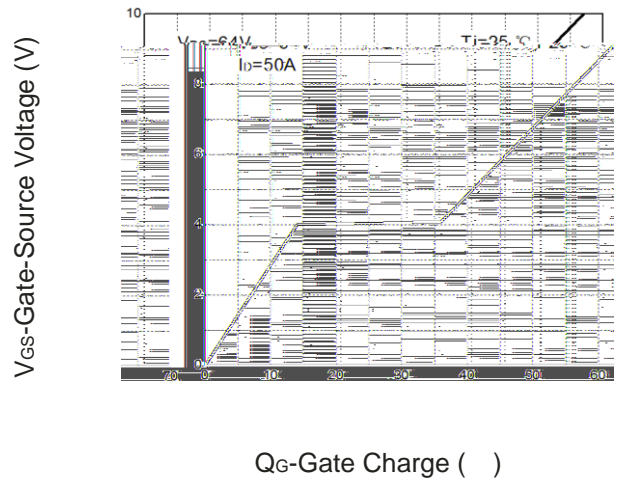
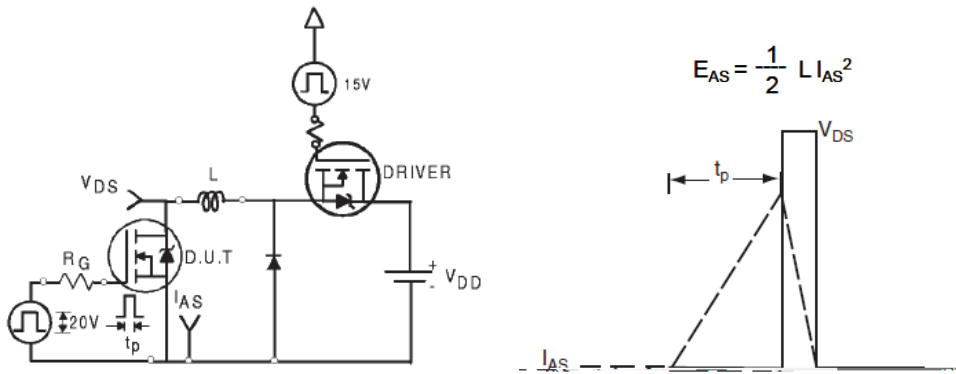


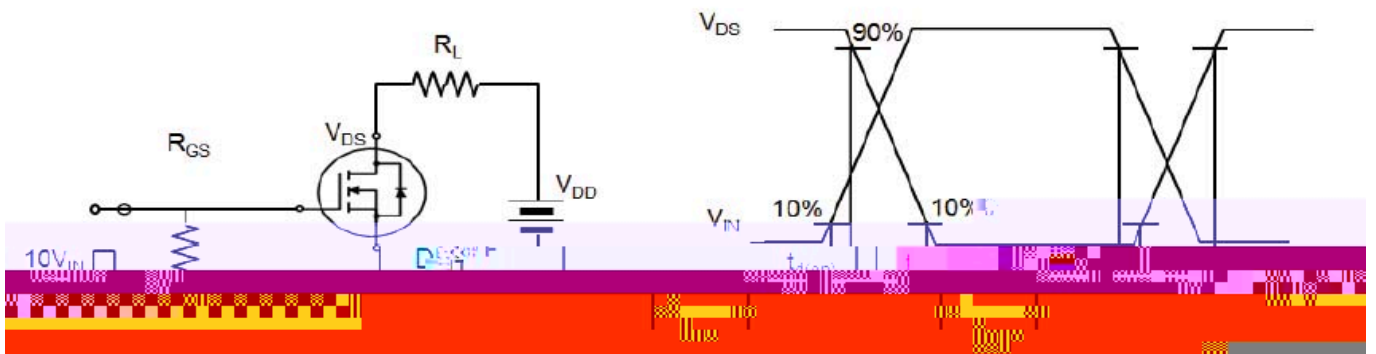
Figure 10: Gate Charge Characteristics



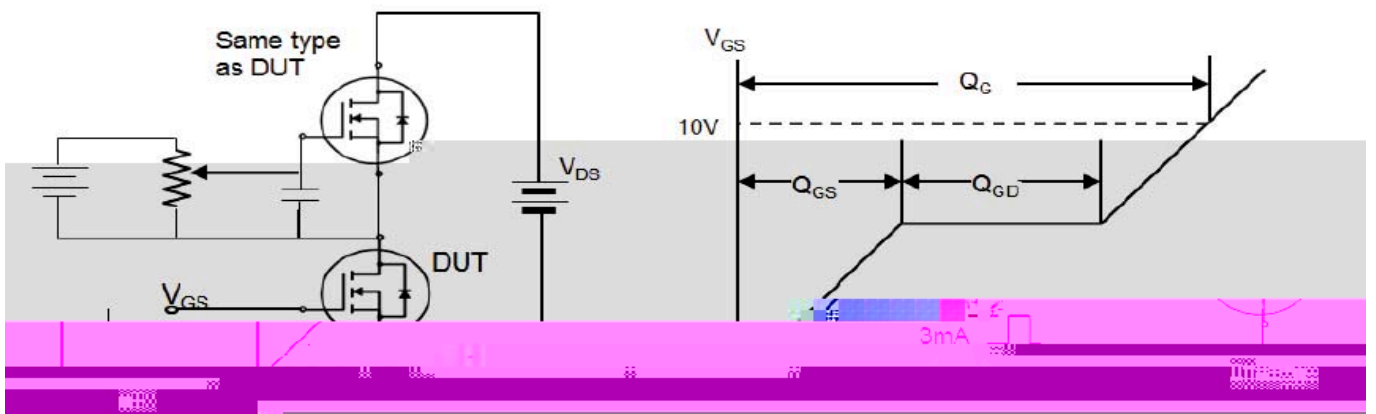
**Avalanche Test Circuit**



**Switching Time Test Circuit**



**Gate Charge Test Circuit**

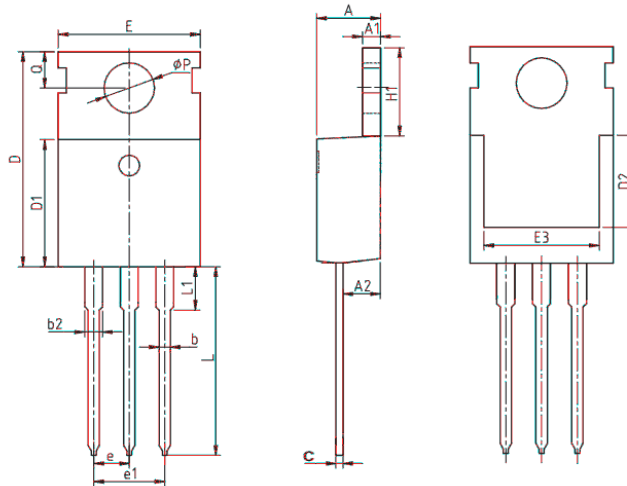


## Device Per Unit

Package Type	Unit	Quantity
TO-220FB-3L	Tube	50

## Package Information

### TO-220FB-3L



### COMMON DIMENSIONS

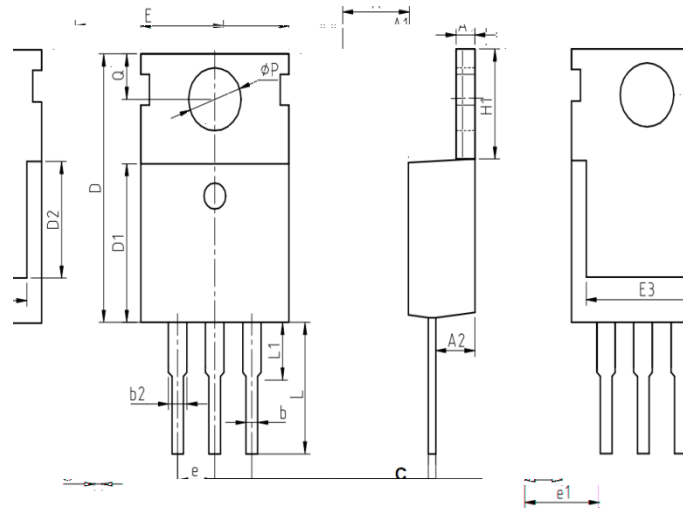
SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.25	1.30	1.45
A2	2.20	2.40	2.60
b	0.70	0.80	0.95
b2	1.17	1.27	1.47
c	0.40	0.50	0.65
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.50	-	-
E	9.70	10.00	10.30
E3	7.00	-	-
e	2.54 BSC		
e1	5.08 BSC		
H1	6.25	6.50	6.85
L	12.75	13.50	13.80
L1	-	3.10	3.40
P	3.40	3.60	3.80
Q	2.60	2.80	3.00

## Device Per Unit

Package Type	Unit	Quantity
TO-220FB-3S	Tube	50

## Package Information

### TO-220FB-3S



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.25	1.30	1.45
A2	2.20	2.40	2.60
b	0.70	0.80	0.95
b2	1.17	1.27	1.47
c	0.40	0.50	0.65
D	15.10	15.60	16.10
D1	8.10	9.10	9.40
D2	5.50	-	-
E	9.70	10.00	10.30
E3	7.00	-	-
e	2.54 BSC		
e1	5.08 BSC		
H1	6.25	6.50	6.85
L	6.80	7.00	7.20
L1	-	3.10	3.40
P	3.40	3.60	3.80
Q	2.60	2.80	3.00

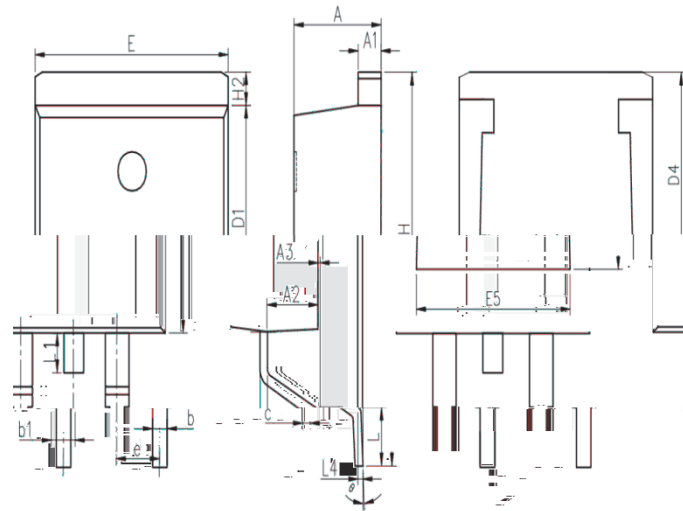


## Device Per Unit

Package Type	Unit	Quantity
TO-263-2L	Reel	50

## Package Information

### TO-263-2L



COMMON DIMENSIONS

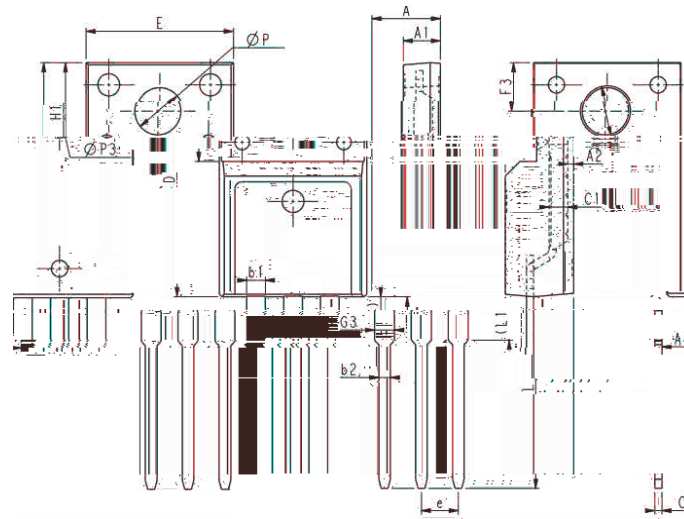
SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.22	1.27	1.42
A2	2.49	2.69	2.89
A3	0	0.13	0.25
b	0.7	0.81	0.96
b1	1.17	1.27	1.47
c	0.3	0.38	0.53
D1	8.5	8.7	8.9
D4	6.6	-	-
E	9.86	10.16	10.36
E5	7.06	-	-
e	2.54 BSC		
H	14.7	15.1	15.5
H2	1.07	1.27	1.47
L	2	2.3	2.6
L1	1.4	1.55	1.7
L4	0.25 BSC		
	0°	5°	9°

## Device Per Unit

Package Type	Unit	Quantity
TO-220MF-3L	Tube	50

## Package Information

### TO-220MF-3L



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
E	9.96	10.16	10.36
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2	0.30	0.45	0.60
A4	2.56	2.76	2.96
c	0.40	0.50	0.65
c1	1.20	1.30	1.35
D	15.57	15.87	16.17
H1	6.70REF		
e	2.54BSC		
L	12.68	12.98	13.28
L1	2.93	3.03	3.13
P	3.03	3.18	3.38
P3	3.15	3.45	3.65
F3	3.15	3.30	3.45
G3	1.25	1.35	1.55
b1	1.18	1.28	1.43
b2	0.70	0.80	0.95



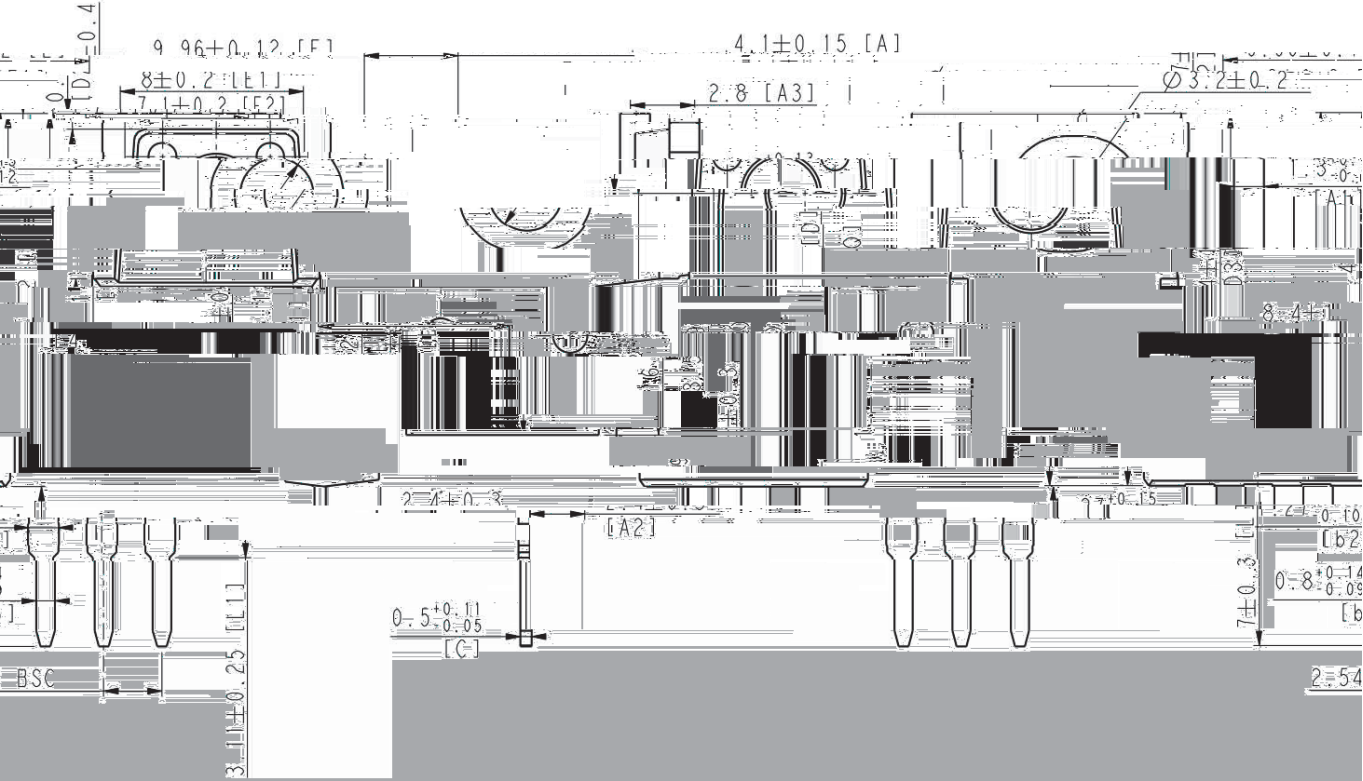
# HY3008P/M/B/ MF /PL/PM

## Device Per Unit

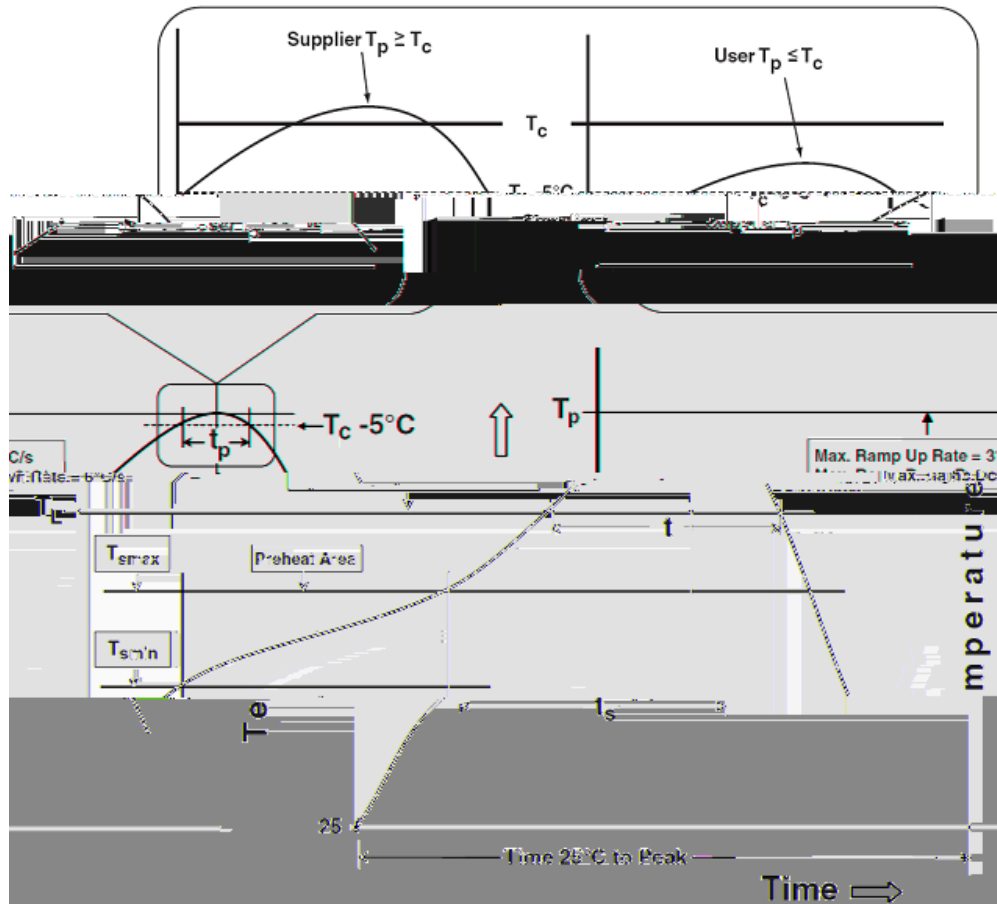
Package Type	Unit	Quantity
TO-3PM-3S	Tube	50

## Package Information

### TO-3PM-3S



Classification Profile



Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
<b>Preheat &amp; Soak</b>		
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.

## HY3008P/M/B/ MF /PL/PM

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

Package Thickness	Volume mm <350	Volume mm 350
2.5 mm	235 °C	220 °C
2.5 mm	220 °C	220 °C

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

Package Thickness	Volume mm <350	Volume mm 350-2000	Volume mm 2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm – 2.5 mm	260 °C	250 °C	245 °C
2.5 mm	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 /1000 Hrs, Bias @ 150°C
PCT	JESD-22, A102	96 Hrs, 100%RH, 2atm, 121°C
TCT	JESD-22, A104	500 Cycles, -55°C~150°C