

# HY3003D/ IV

N-Ch

## Feature

- 30V/100A  
 $R_{DS(ON)} = 2.9m\Omega(\text{typ.})@V_{GS} = 10V$   
 $R_{DS(ON)} = 3.8m\Omega(\text{typ.})@V_{GS} = 4.5V$
- 100% Av I nche Tested
- Reli le nd Rugged
- H logen Free nd Green Devices Av il le  
(RoHS Compli nt)

TO-252-2L

TO-251-3L

TO-251-3S

## Applications

- Power M n gement for Inverter Systems

## Ordering and Marking Information

D	U	V
HY3003	HY3003	HY3003
XYMXXXXXX	XY ✕ Y ✕	

**Absolute Maximum Ratings**

Symbol		
<b>Common Ratings (Tc=25°C)</b>		
V <sub>DSS</sub>	Drain-Source Voltage	
V <sub>GSS</sub>	Gate-Source Voltage	
T <sub>J</sub>	Junction Temperature Range	
T <sub>STG</sub>	Storage Temperature Range	
I <sub>S</sub>	Source Current-Continuous(Body Diode)	Tc=25°C
<b>Mounted on Large Heat Sink</b>		
I <sub>DM</sub>	Pulsed Drain Current *	Tc=25°C
I <sub>D</sub>	Continuous Drain Current	Tc=25°C
		Tc=100°C
P <sub>D</sub>	Maximum Power Dissipation	Tc=25°C
		Tc=100°C
R <sub>θJC</sub>	Thermal Resistance, Junction-to-Case	
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient **	
E <sub>AS</sub>	Single Pulsed-Avalanche Energy ***	

Note: \* Repetitive rating; pulse width limited  
 \*\* Surface mounted on FR-4 board.  
 \*\*\* Limited by T<sub>Jmax</sub>, starting T<sub>J</sub>=25°C

**Electrical Characteristics(Tc=25°C)**

Symbol	Parameter	Test Conditions			
<b>Static Characteristics</b>					
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =2mA			
I <sub>DSS</sub>	Drain-to-Source Leakage Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			
		T <sub>J</sub> =125°C			
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =2mA			
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			
R <sub>DS(ON)*</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>DS</sub> =1A			
		V <sub>GS</sub> =4.5V, I <sub>DS</sub> =1A			
<b>Diode Characteristics</b>					
V <sub>SD*</sub>	Diode Forward Voltage	I <sub>SD</sub> =30A, V <sub>GS</sub> =0V			
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =20A, dI <sub>SD</sub> /dt=100A/μs	-	11	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	3	nC

**Electrical Characteristics (Cont.)** (Tc=25°C)

Sym ol	Parameter
<b>Dynamic Characteristics</b>	
R <sub>G</sub>	Gate Resist nce
C <sub>iss</sub>	Input C p cit nce
C <sub>oss</sub>	Output C p cit nce
C <sub>rss</sub>	Reverse Tr nsfer C p cit nce
t <sub>d(ON)</sub>	Turn-on Del y T
T <sub>r</sub>	Turn-on Rise T
t <sub>d(OFF)</sub>	Turn-off Del y T
T <sub>f</sub>	Turn-off Fall T
<b>Gate Charge</b>	
Q (10V)	Gate Charge at 10V
Q (4.5V)	Gate Charge at 4.5V
Q <sub>s</sub>	Gate-Source Charge
Q <sub>d</sub>	Gate-Drain Charge

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

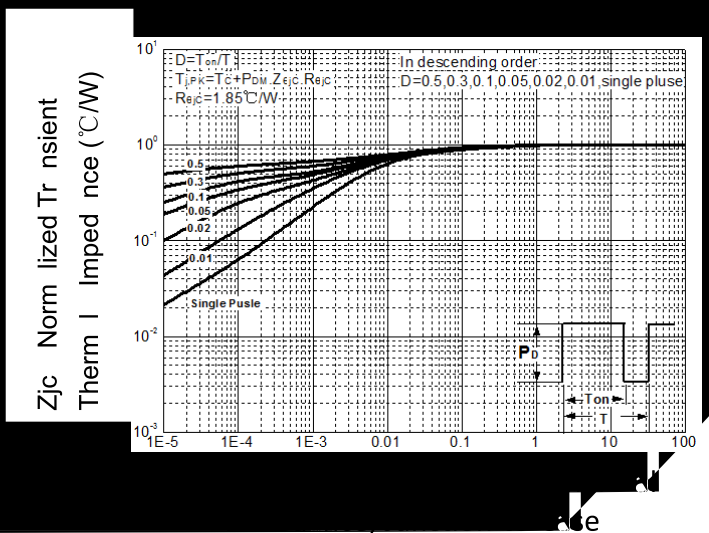
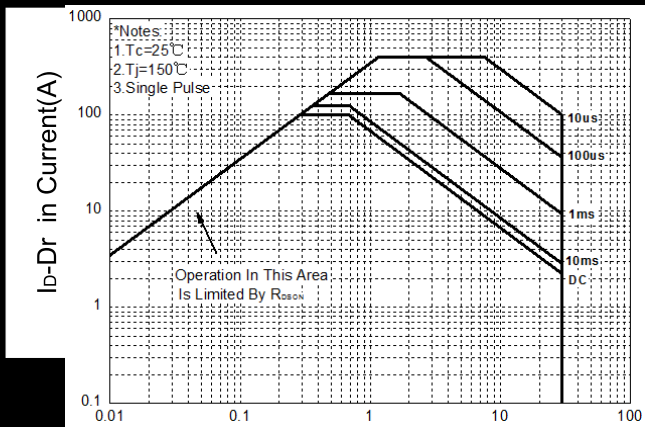
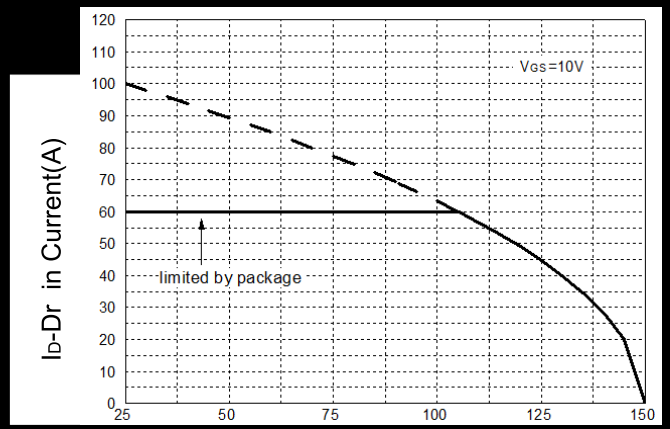
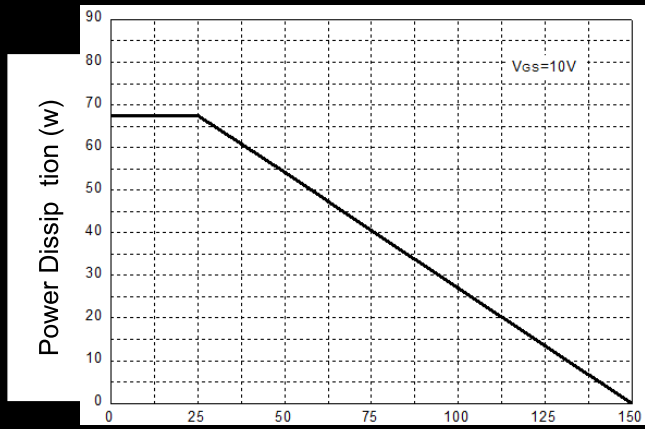


Figure 5: Output Characteristics

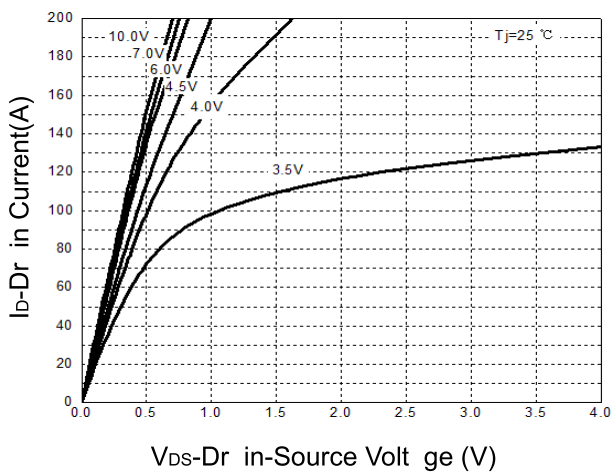
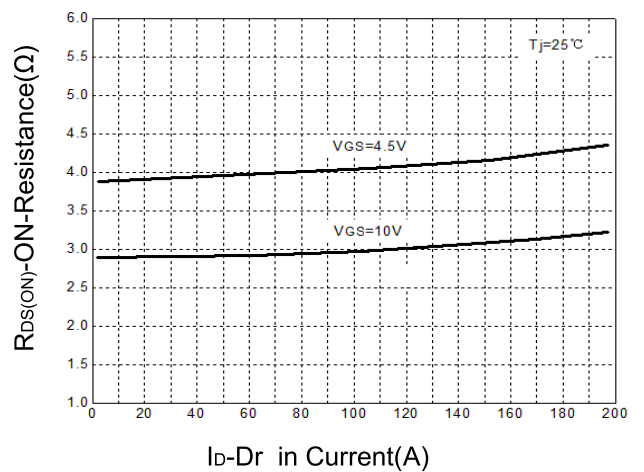
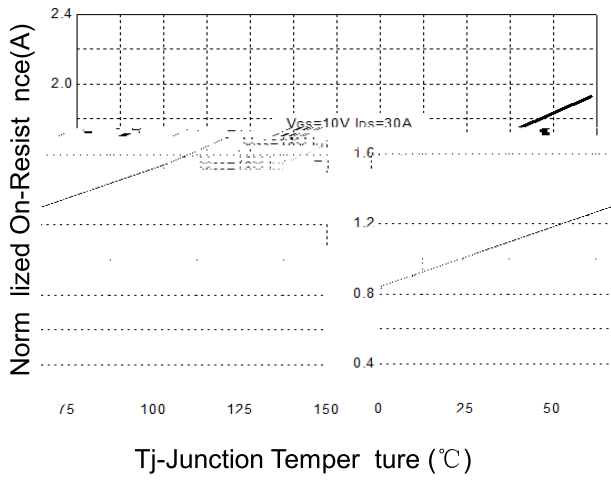


Figure 6: Drain-Source On Resistance

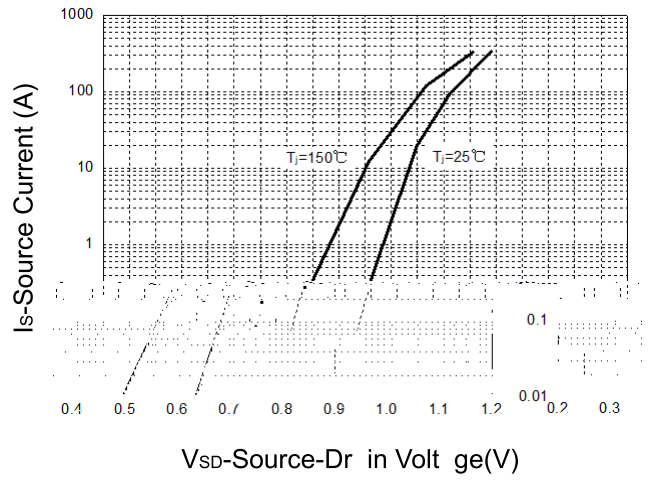


**Typical Operating Characteristics(Cont.)**

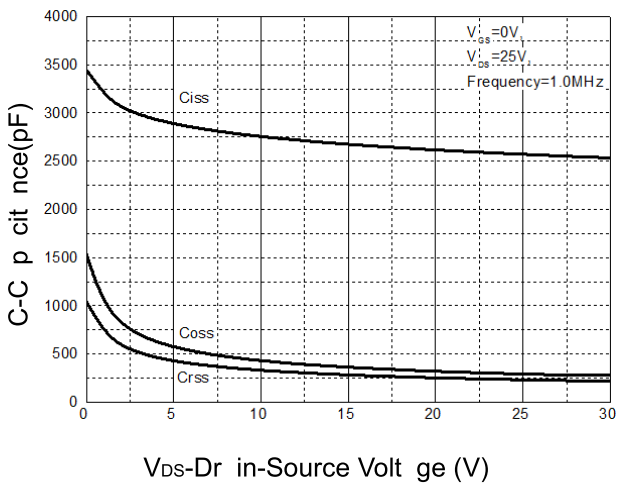
**Figure 7: On-Resistance vs. Temperature**



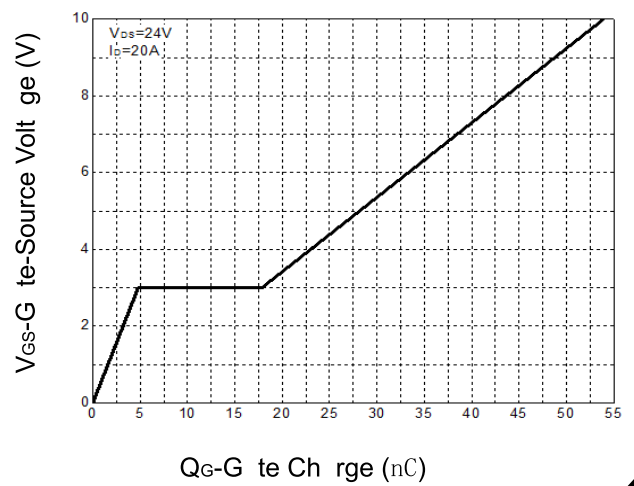
**Figure 8: Source-Drain Diode Forward**



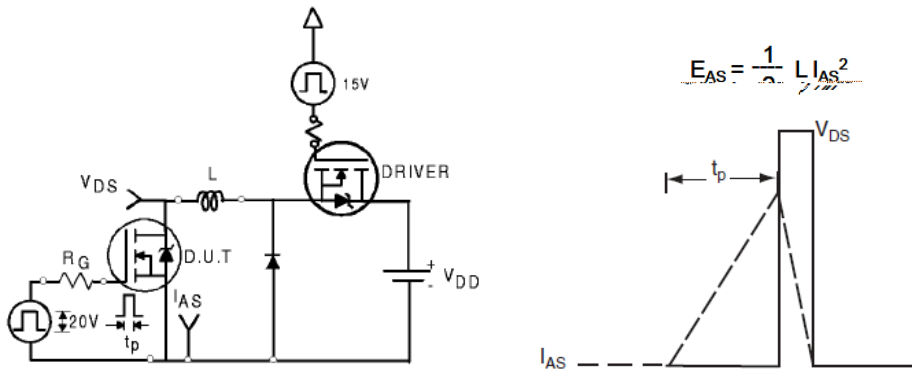
**Figure 9: Capacitance Characteristics**



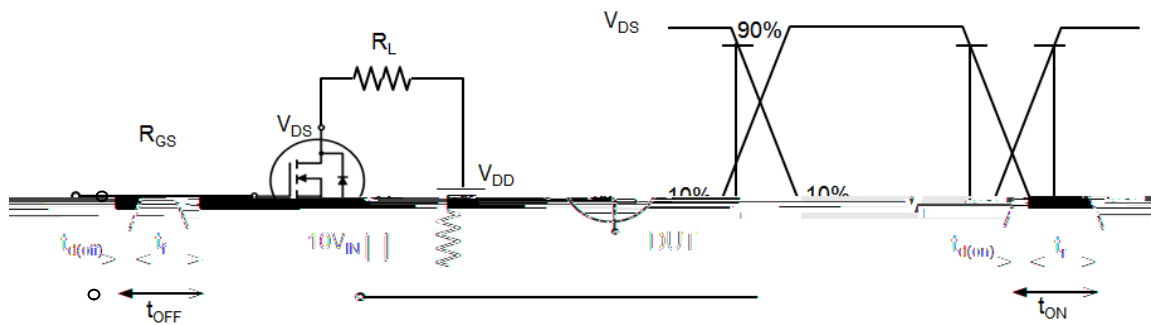
**Figure 10: Gate Charge Characteristics**



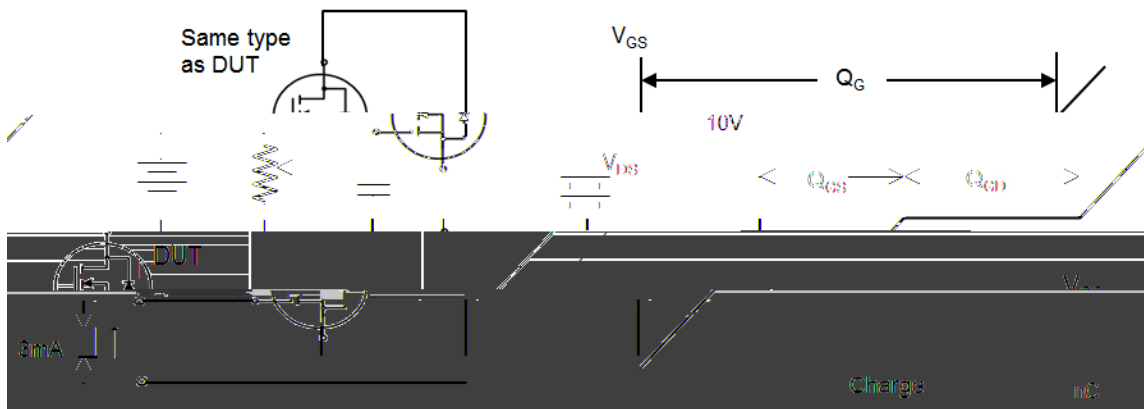
### Avalanche Test Circuit



### Switching Time Test Circuit



### Gate Charge Test Circuit

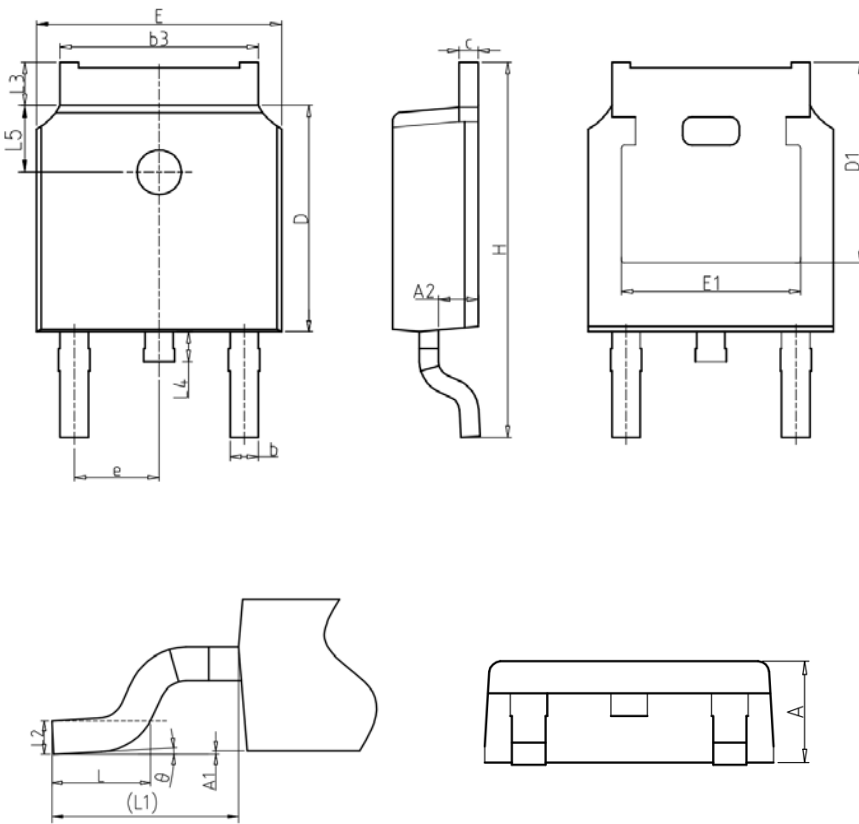


**Device Per nit**

Package T
TO-2
TO-2
TO-2

**Package Information**

TO-252-2L

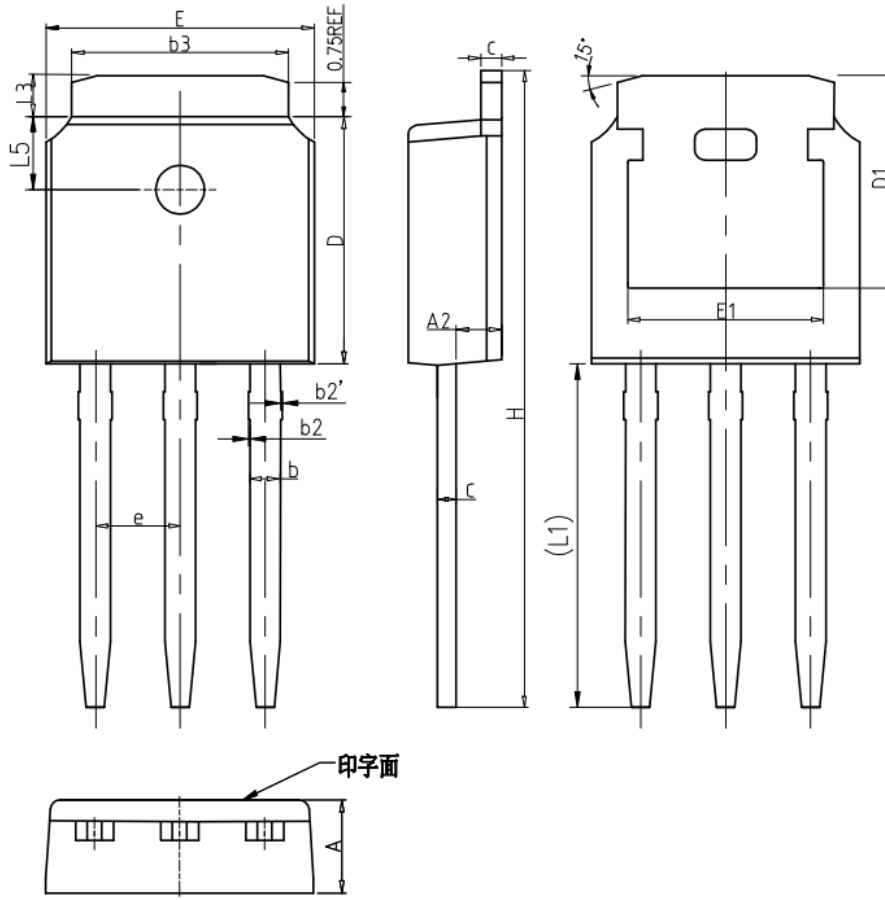


**COMMON DIMENSIONS**

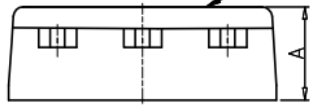
SYMBOL	mm		
	MIN	NOM	MAX
A	2.20	2.30	
A1	0.00		
A2	0.97		
	0.68		
3			
c	0.4		
D			
D1			
E	6.40	6.60	
E1	4.63	-	
e	2.286BSC		
H	9.40	10.1	
L	1.38		
L1			
L2			
L3			
L4			
L			
theta			

# HY3003D/ IV

TO-251-3L



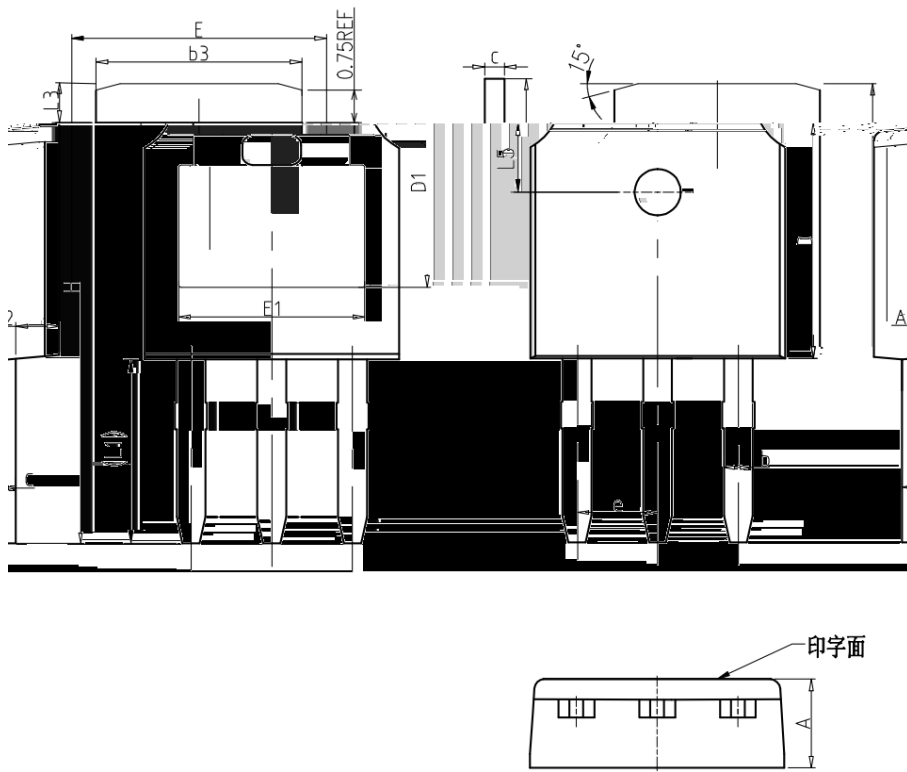
印字面



C



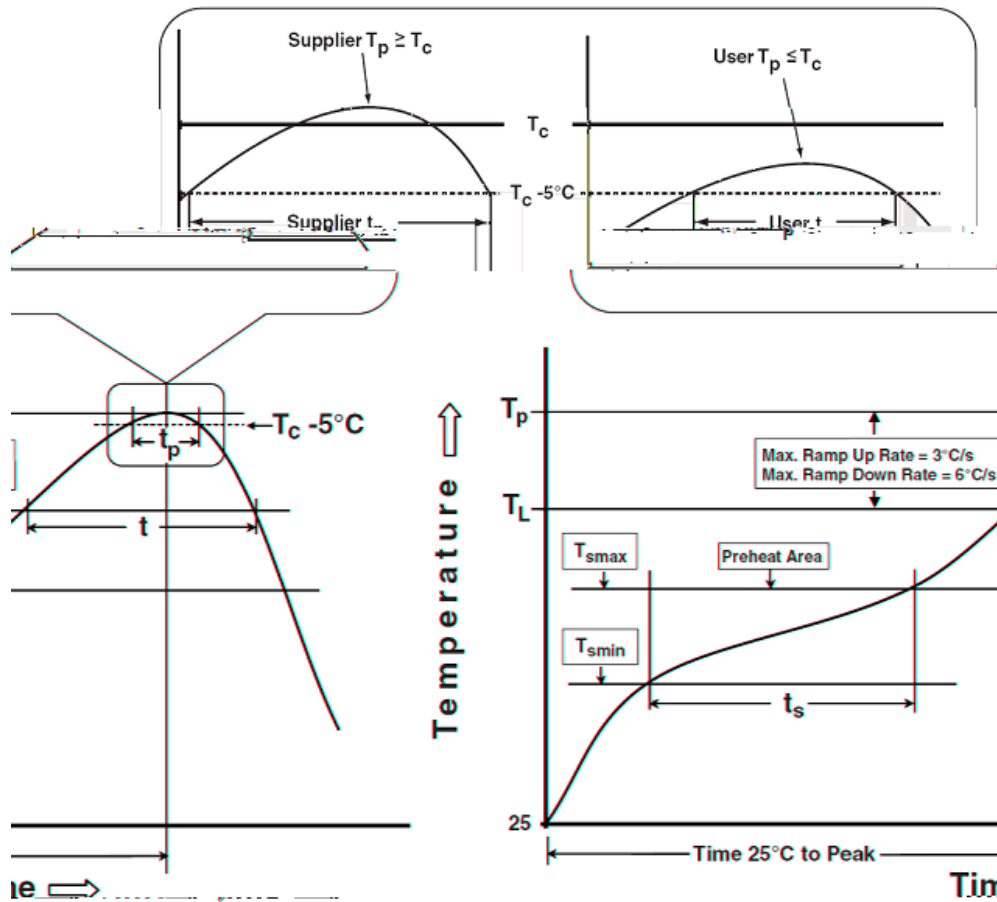
TO-251-3S



COMMON DIMENSIONS

SYMBOL	mm	
	MIN	NOM
A	2.20	
A2	0.97	
	0.68	
3		
c	0.4	
D		
D1		
E	6.40	
E1	4.63	
e		
H		
L1		
L3		
L		

### Classification Profile



### Classification Reflow Profiles

Profile Feature	Sn-P E
<b>Preheat &amp; Soak</b>	
Temperature min ( $T_{smin}$ )	
Temperature max ( $T_{smx}$ )	
Time ( $T_{smin}$ to $T_{smx}$ ) ( $t_s$ )	
Average ramp-up rate ( $T_{smx}$ to $T_p$ )	
Liquidous temperature ( $T_L$ )	
Time liquidous ( $t_l$ )	
Peak body Temperature ( $T_p$ )*	
Time ( $t_p$ )** within classification	
Average	
Time 2	
*Tolerance	
** Tolerance for time	

# HY3003D/ IV

Table 1. SnP Eutectic Process

Package Thickness
<2.
≥2.

Table 2. Pb-free Process – Class

Package Thickness
<1.6 mm
1.6 mm – 2.
≥2.

## Reliability Test Program

Test item	Method	
SOLDERABILITY	JESD-22, B102	
HTRB	JESD-22, A108	168 Hr
PCT	JESD-22, A102	96 Hr
TCT	JESD-22, A104	2.

### Customer Service

Worldwide Sales and Service: [sales@hymex.com](mailto:sales@hymex.com)

Technical Support