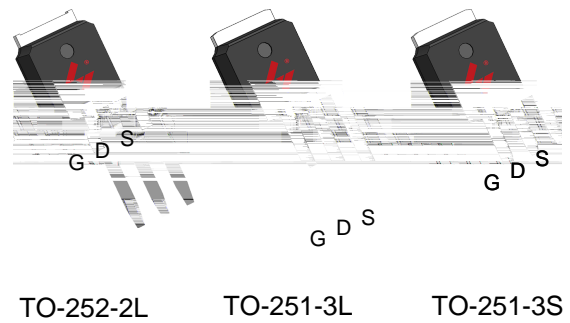


## N-Channel Enhancement Mode MOSFET

### Features

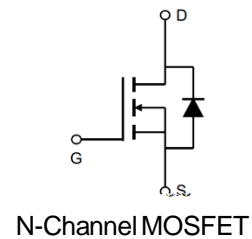
- 80V/90A,  
 $R_{DS(ON)}=7.8m$  (typ.) @  $V_{GS}=10V$
- Avalanche Rated
- Reliable and Rugged
- Lead Free and Green Devices Available  
 (RoHS Compliant)

### Pin Description






### Applications

Power Management for Inverter Systems.



### Ordering and Marking Information

 <b>D</b> <b>HY1908</b> XYMXXXXXX	 <b>U</b> <b>HY1908</b> XYMXXXXXX	 <b>V</b> <b>HY1908</b> XYMXXXXXX	Package Code D : TO-252-2L    U : TO-251-3L    V : TO-251-3L  Date Code XYMXXXXXX
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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.

# HY1908D/U/V

## Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	80	V
$V_{GSS}$	Gate-Source Voltage	$\pm 25$	
$T_J$	Maximum Junction Temperature	175	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 90	A
<b>Mounted on Large Heat Sink</b>			
$I_{DM}$		$T_C=25^\circ\text{C}$ 315**	A
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$ 90	A
		$T_C=100^\circ\text{C}$ 59	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 64	W
		$T_C=100^\circ\text{C}$ 32	
$R_{JC}$	Thermal Resistance-Junction to Case	2.35	$^\circ\text{C}/\text{W}$
$R_{JA}$	Thermal Resistance-Junction to Ambient	110	
<b>Avalanche Ratings</b>			
$E_{AS}$	Avalanche Energy, Single Pulsed	$L=0.5\text{mH}$ 214***	mJ

## Electrical Characteristics ( $T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

			<b>HY1908</b>	
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80

A, V

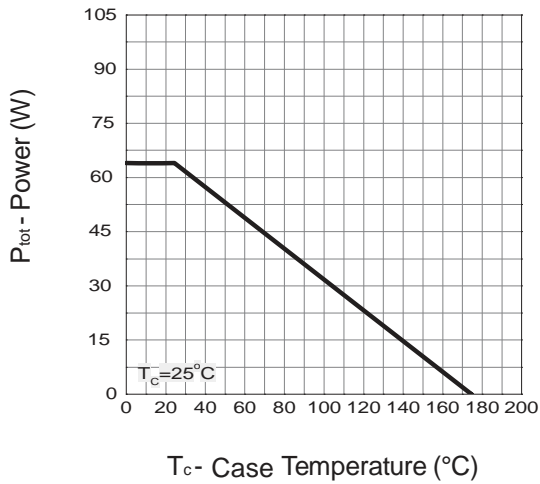
# HY1908D/U/V

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

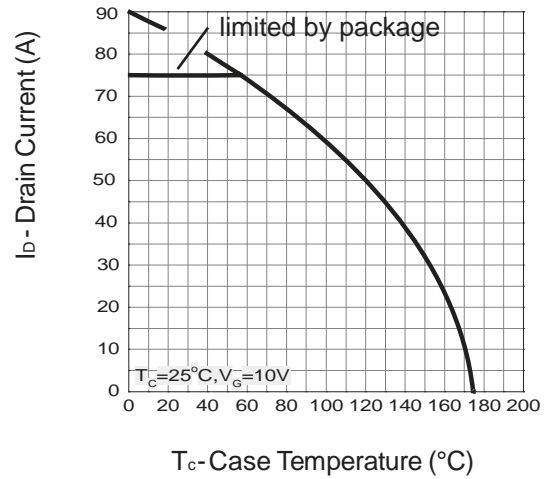
Symbol	Parameter	Test Conditions				Unit
			Min.	Typ.	Max.	
<b>Dynamic Characteristics</b>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	-	1.2	-	
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, Frequency=1.0MHz	-	3864	-	pF
C <sub>oss</sub>	Output Capacitance		-	365	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	239	-	
t <sub>d(ON)</sub>	Turn-on Delay Time		-	26		ns
T <sub>r</sub>	Turn-on Rise Time	-	42			
t <sub>d(OFF)</sub>	Turn-off Delay Time	-	64			
T <sub>f</sub>	Turn-off Fall Time	-	20			
<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> =45A	-	84		nC
Q <sub>gs</sub>	Gate-Source Charge		-	16	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	26	-	

## Typical Operating Characteristics

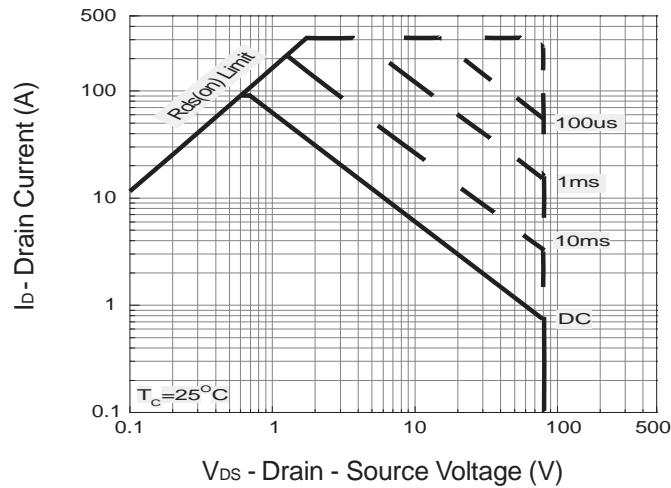
Power Dissipation



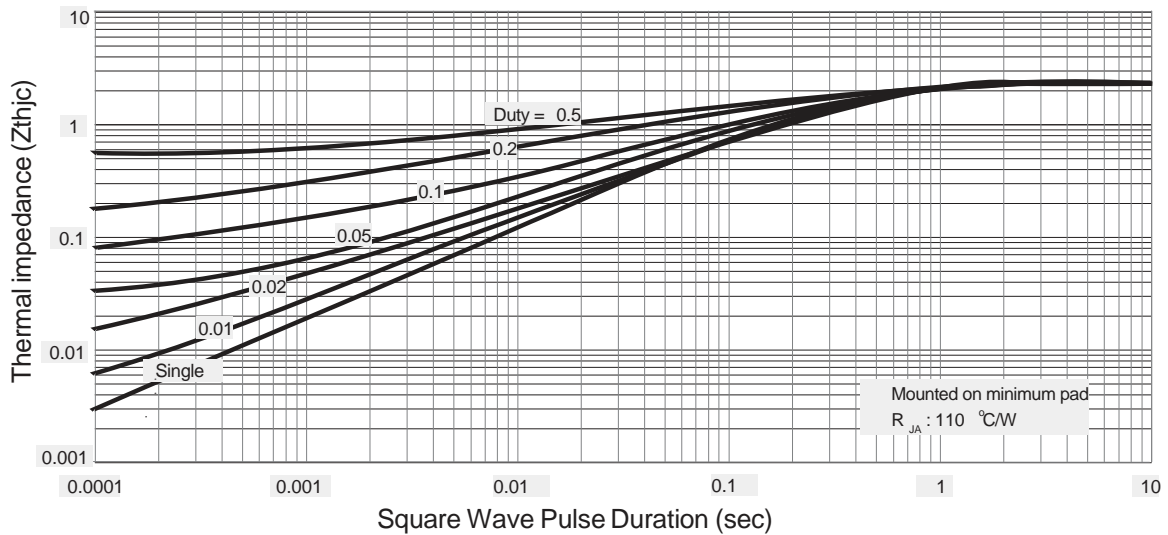
Drain Current



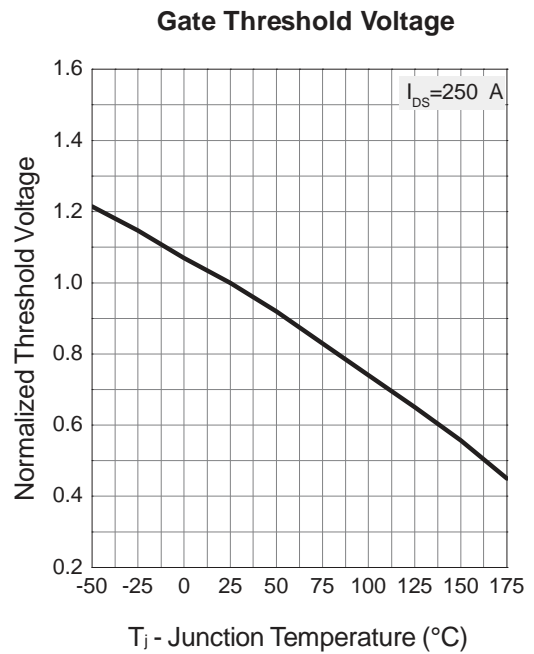
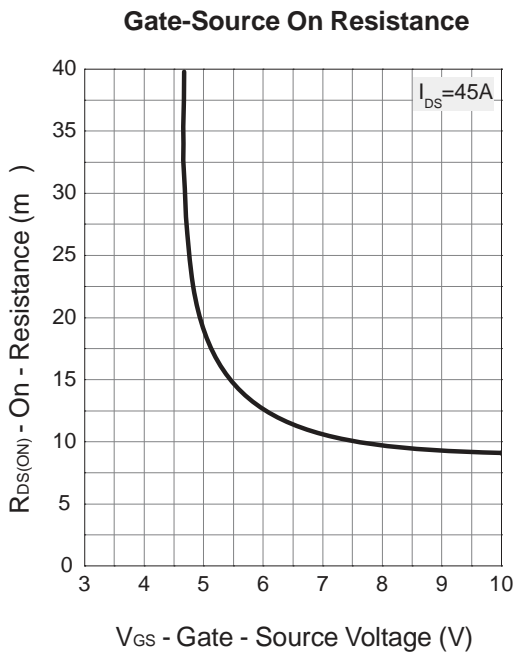
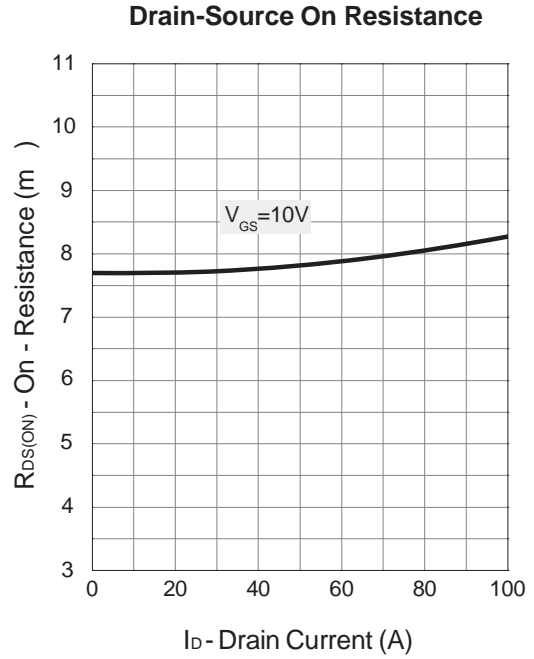
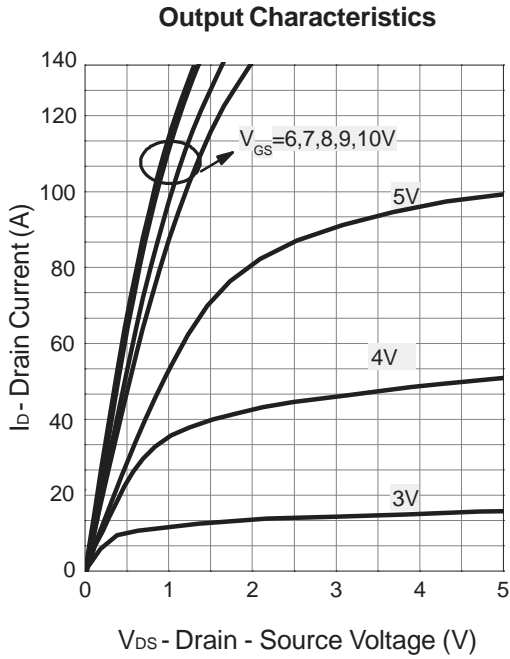
Safe Operation Area



Thermal Transient Impedance

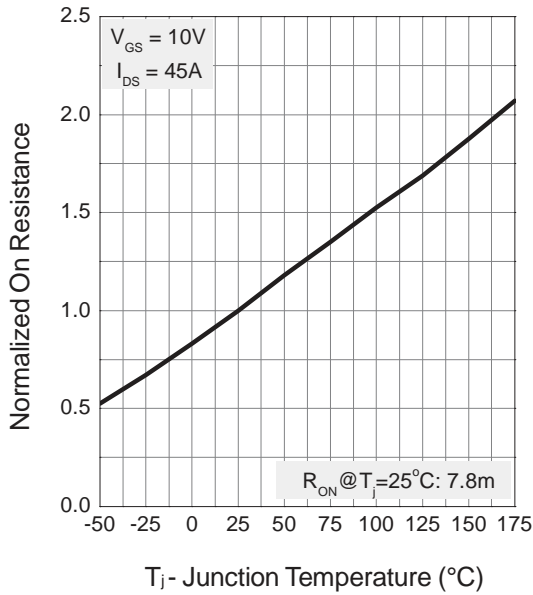


## Typical Operating Characteristics (Cont.)

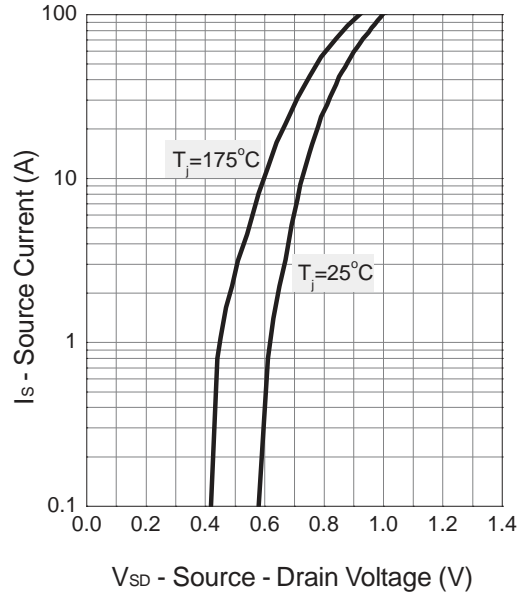


### Typical Operating Characteristics (Cont.)

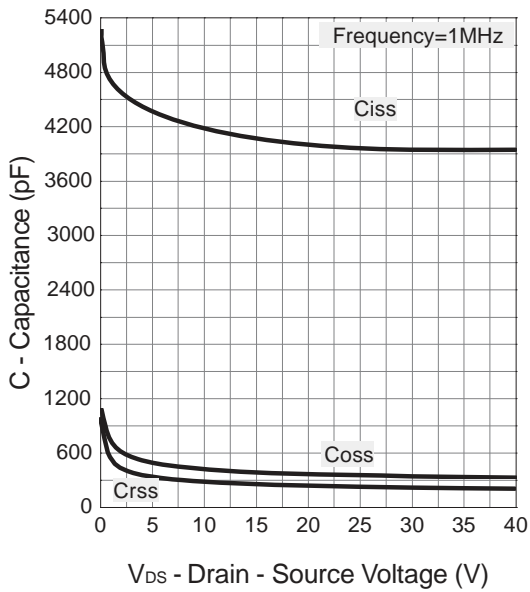
**Drain-Source On Resistance**



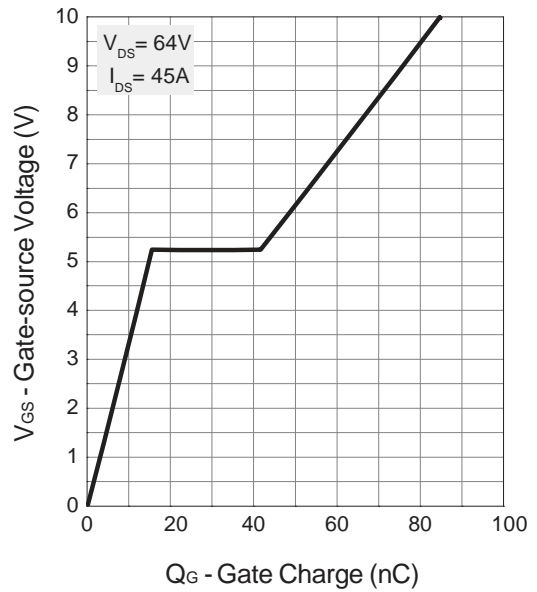
**Source-Drain Diode Forward**



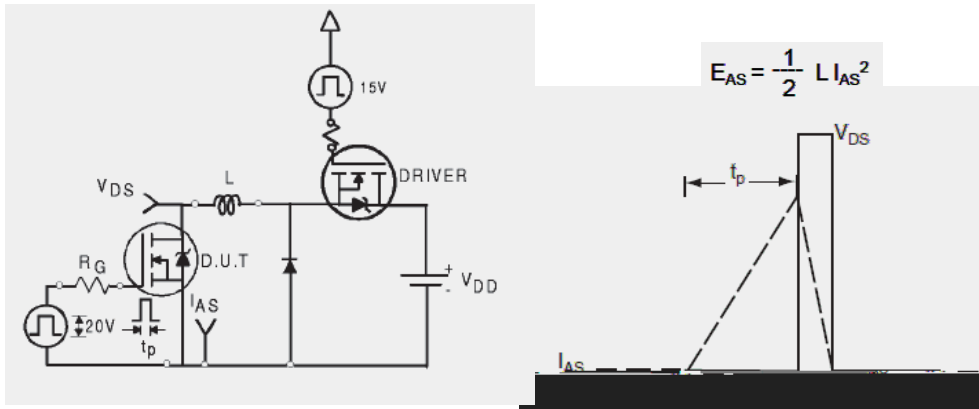
**Capacitance**



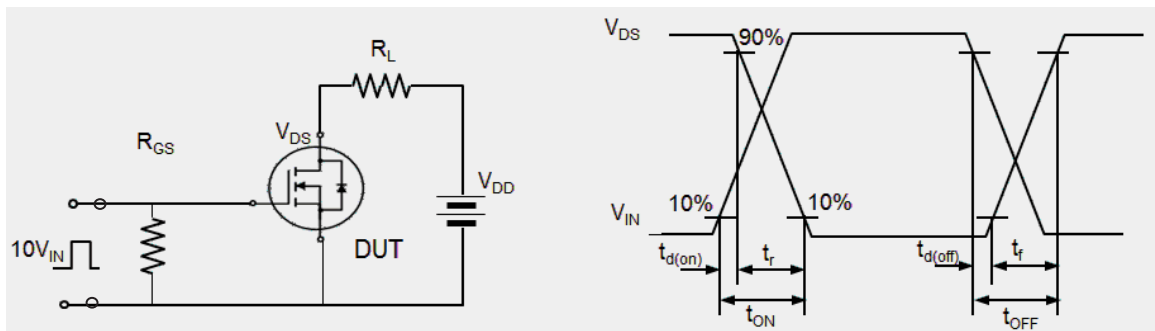
**Gate Charge**



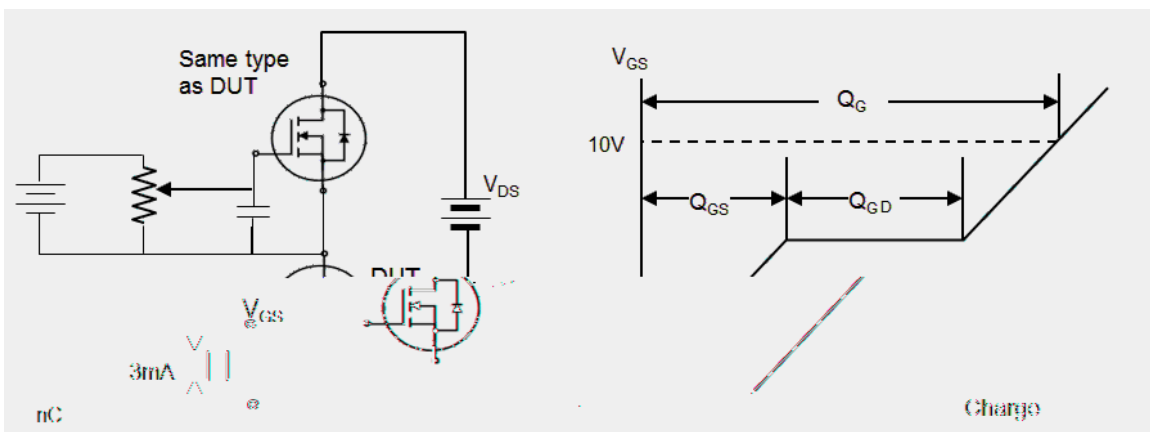
### Avalanche Test Circuit



### Switching Time Test Circuit



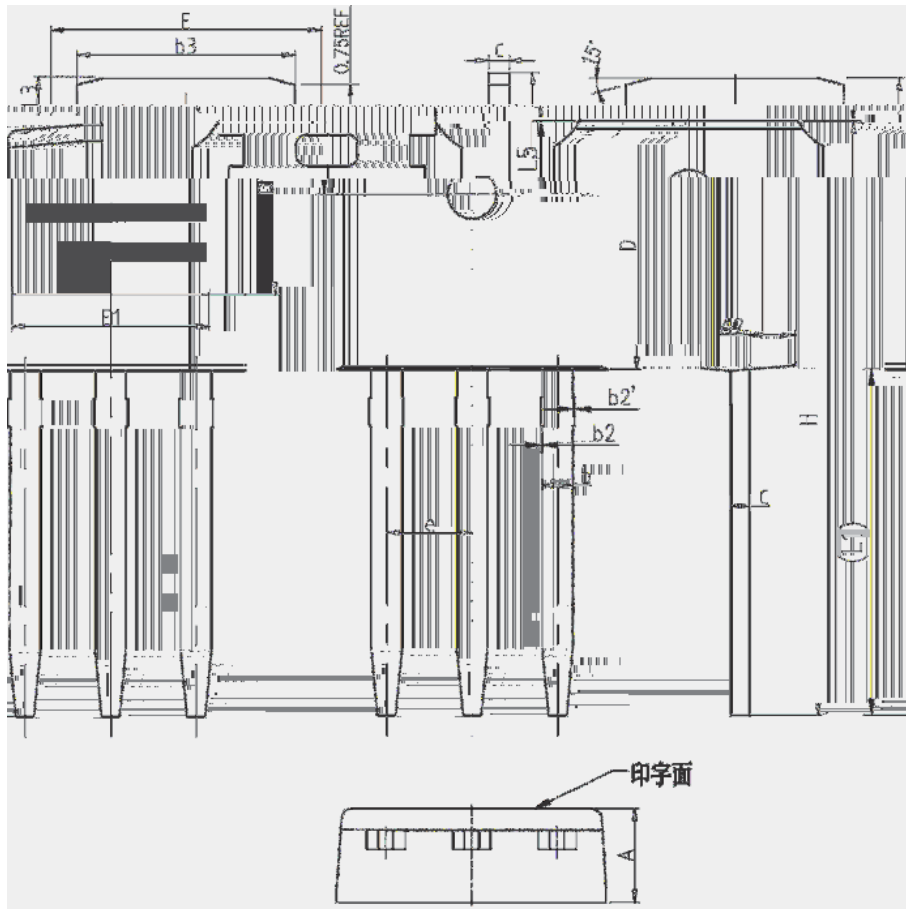
### Gate Charge Test Circuit







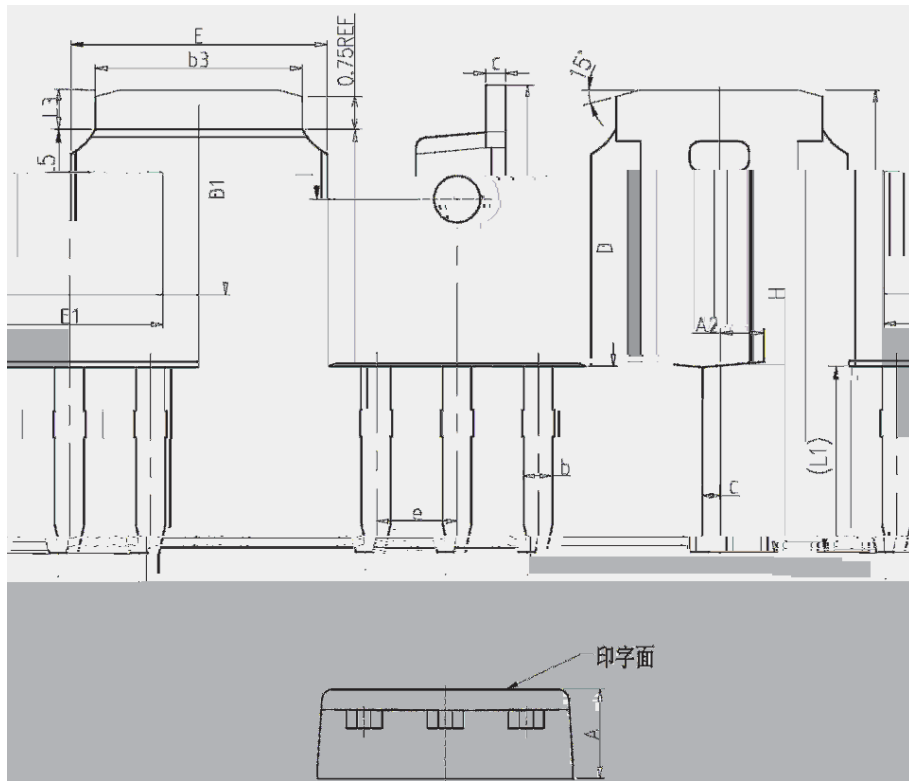
TO-251-3L



### COMMON DIMENSIONS

SYMBOL	mm		
	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	mm		
	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

**HY1908D/U/V**

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

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥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 <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 C	260 C	260 C
– 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	168Hrs/500Hrs/1000Hrs,Bias@125 C
PCT	JESD-22, A102	96 Hrs, 100 RH, 2atm, 121 C
TCT	JESD-22, A104	500 Cycles, -55 C~150 C

### Customer Service

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