

80A, 30V N-CHANNEL MOSFET

GENERAL DESCRIPTION

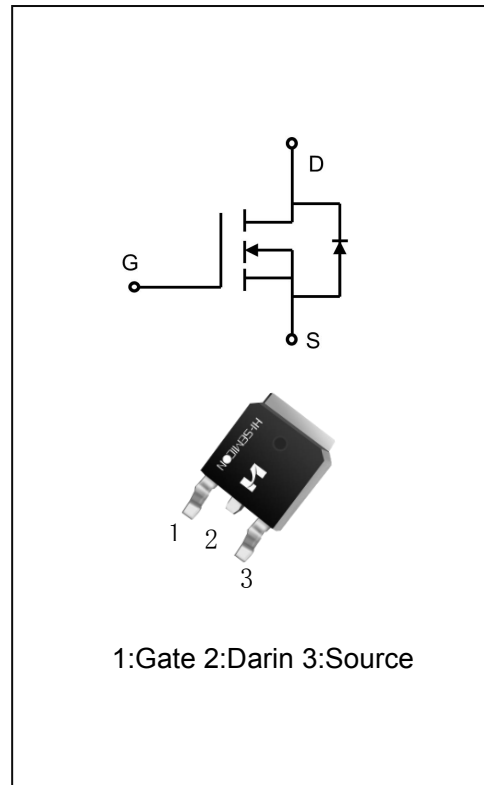
The SFD3008T uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety applications.

Features

- ◆ $V_{DS}=30V, I_D=80A$
- ◆ $R_{DS(on)}$
TYP: $4.6m\Omega @ V_{GS}=10V, I_D=20A$

Applications

- ◆ Power faction correction (PFC)
- ◆ Switched mode power supplies (SMPS)
- ◆ Uninterruptible power supply (UPS)
- ◆ LED lighting power



ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SFD3008T	TO-252-2L	SFD3008T	Pb Free	Reel

ABSOLUTE MAXIMUM RATINGS (T_J=25°C unless otherwise noted)

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V _{DS}	30	V
Gate-Source Voltage		V _{GS}	±20	V
Drain Current	T _C = 25°C	I _D	80	A
	T _C = 100°C		46	
Drain Current Pulsed(Note 1)		I _{DM}	280	A
Power Dissipation(T _C =25°C) -Derate above 25°C		P _D	46	W
Single Pulsed Avalanche Energy (Note 2)		E _{AS}	56	mJ
Operation Junction Temperature Range		T _J	-55~+150	°C
Storage Temperature Range		T _{stg}	-55~+150	°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		TL	300	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	MAX	Unit
Thermal Resistance, Junction-to-Case	R _{θJC}	2.52	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain -Source Breakdown Voltage	B _{VDS}	V _{GS} =0V, I _D =250μA	30	34	--	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	--	9.1	100	nA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =20V, V _{DS} =0V	--	1.5	100	nA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =-20V, V _{DS} =0V	--	-1.6	-100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _D =250μA	1.0	1.6	2.5	V
Static Drain- Source On State Resistance	R _{DS(on)}	V _{GS} =5.0V, I _D =10A	--	6.8	8.3	mΩ
		V _{GS} =10V, I _D =20A	--	4.6	6.0	mΩ
Dynamic Characteristics						
Gate Resistance	R _g	V _{GS} =0V; f=1.0MHZ	1	4.1	10	Ω
Input Capacitance	C _{iss}	V _{DS} =15V V _{GS} =0V f=1.0MHZ	--	1620	--	pF
Output Capacitance	C _{oss}		--	240	--	
Reverse Transfer Capacitance	C _{rss}		--	235	--	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =15V R _G =10Ω; I _D =30A (Note 3.4)	--	7.3	--	ns
Turn-on Rise Time	t _r		--	15.0	--	
Turn-off Delay Time	t _{d(off)}		--	35.8	--	
Turn-off Fall Time	t _f		--	8.2	--	

Total Gate Charge	Q_g	$V_{DS}=15V, I_D=30A$ $V_{GS}=10V$ (Note 3.4)	--	29.6	--	nc
Gate-Source Charge	Q_{gs}		--	8.8	--	
Gate-Drain Charge	Q_{gd}		--	6.2	--	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	Integral Reverse P-N Junction Diode in the MOSFET	--	--	80	A
Pulsed Source Current	I_{SM}		--	--	280	
Diode Forward Voltage	V_{SD}	$I_S=30A, V_{GS}=0V$	--	0.9	1.2	V
Reverse Recovery Time	T_{rr}	$I_F=10A, V_R=15V,$ $dI_F/dt=100A/\mu S$	--	142	--	ns
Reverse Recovery Charge	Q_{rr}		--	26	--	μC

1. Pulse width limited by maximum junction temperature
2. $L=0.5mH, I_{AS}=15A, V_{DD}=25V, V_G=10V, R_G=25\Omega,$ starting $T_J=25^\circ C$
3. Pulse Test: Pulse width $\leq 300\mu s,$ Duty cycle $\leq 2\%$
4. Essentially independent of operating temperature

Typical Performance Characteristics

Figure 1: Output Characteristics

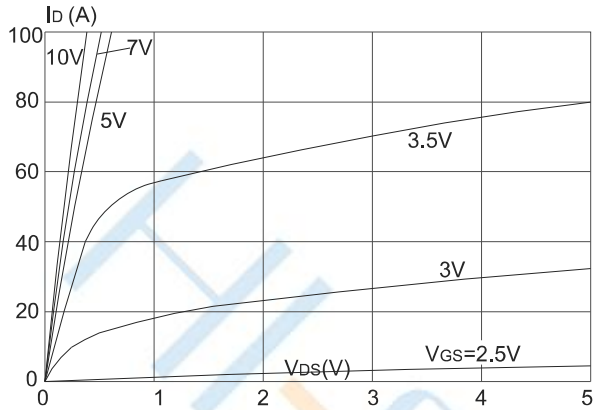


Figure 2: Typical Transfer Characteristics

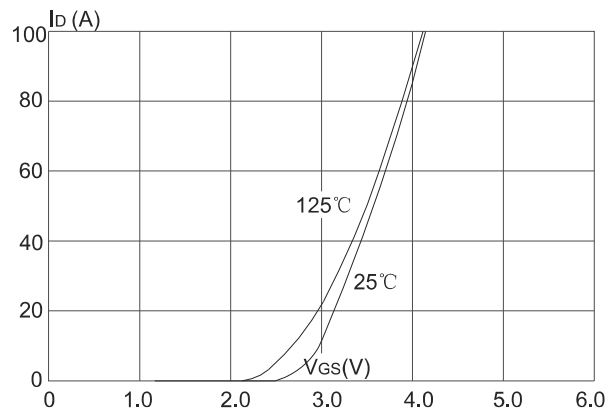


Figure 3: On-resistance vs. Drain Current

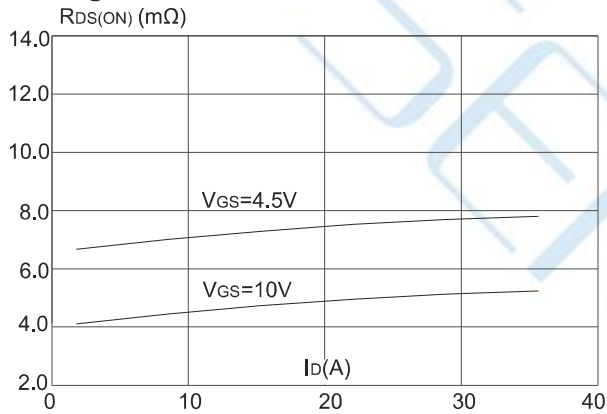


Figure 4: Body Diode Characteristics

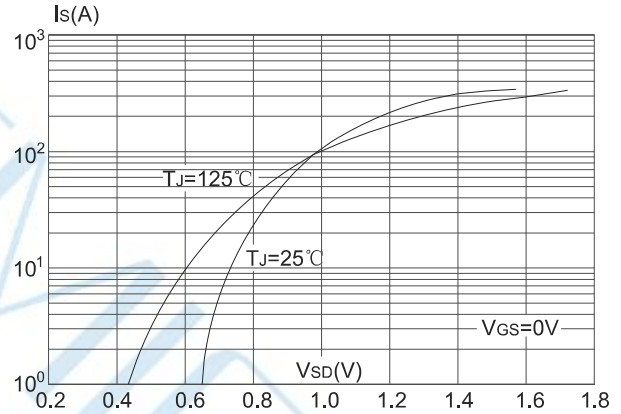


Figure 5: Gate Charge Characteristics

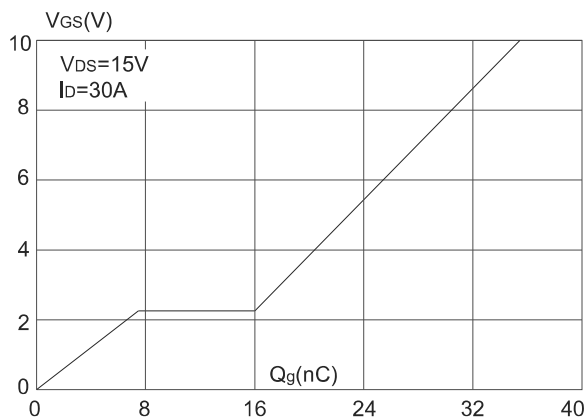
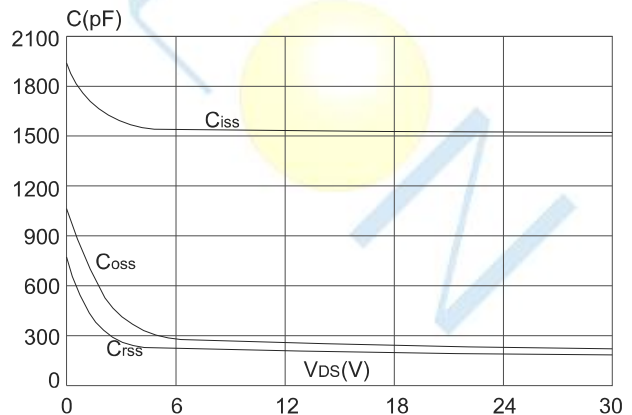


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

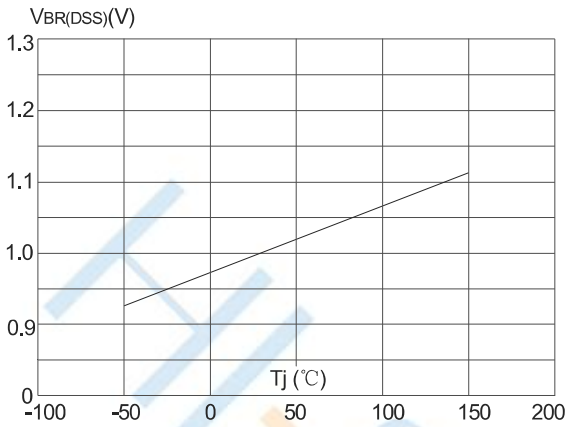


Figure 8: Normalized on Resistance vs. Junction Temperature

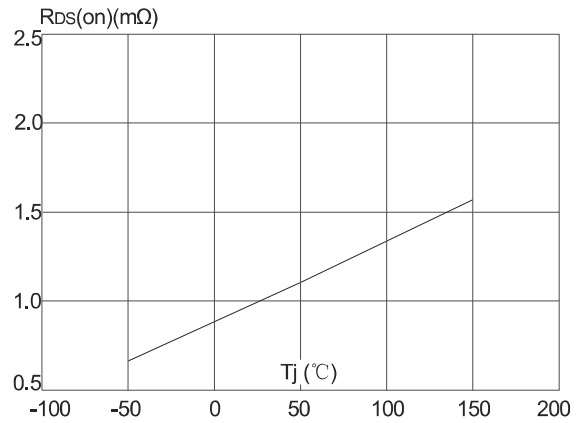


Figure 9: Maximum Safe Operating Area

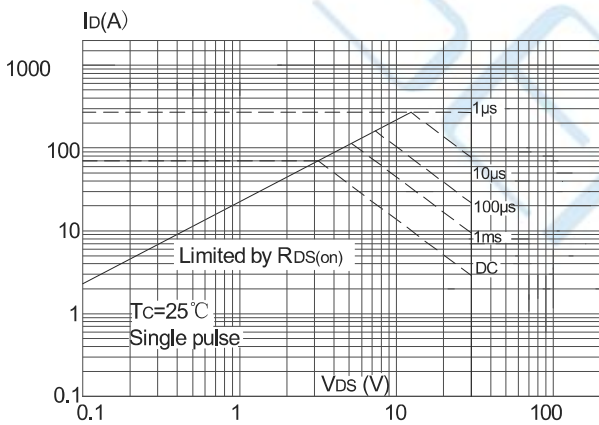


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

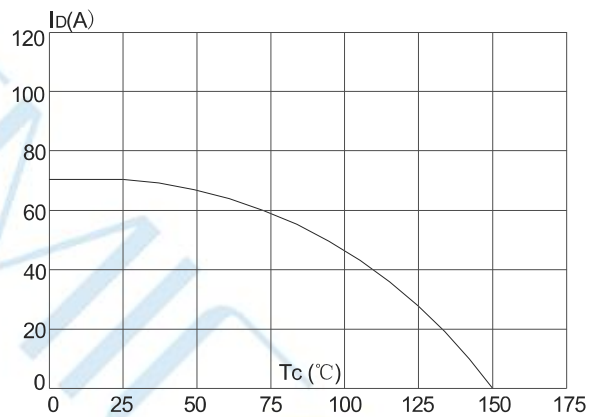
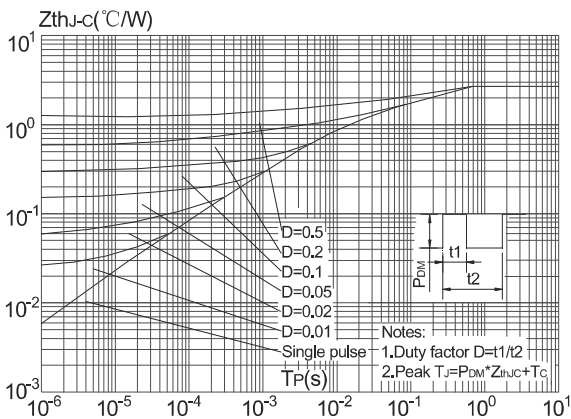


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

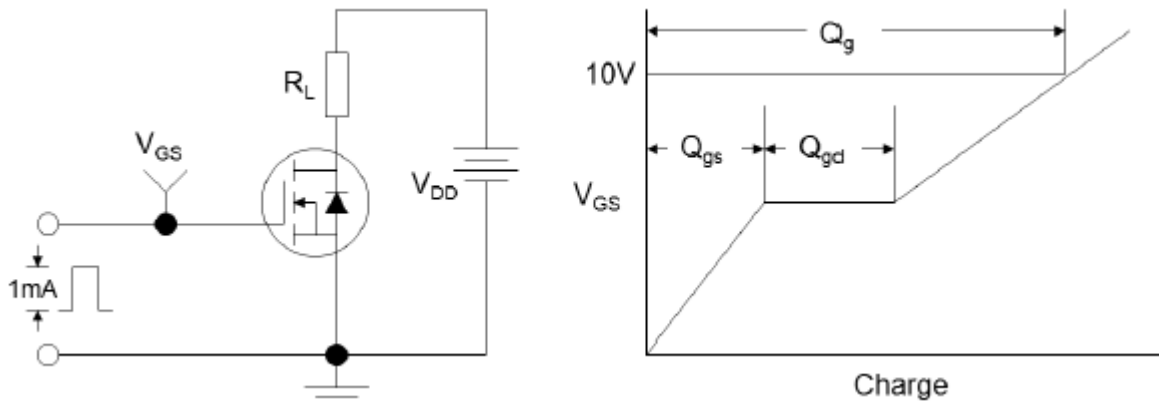


Figure1:Gate Charge Test Circuit & Waveform

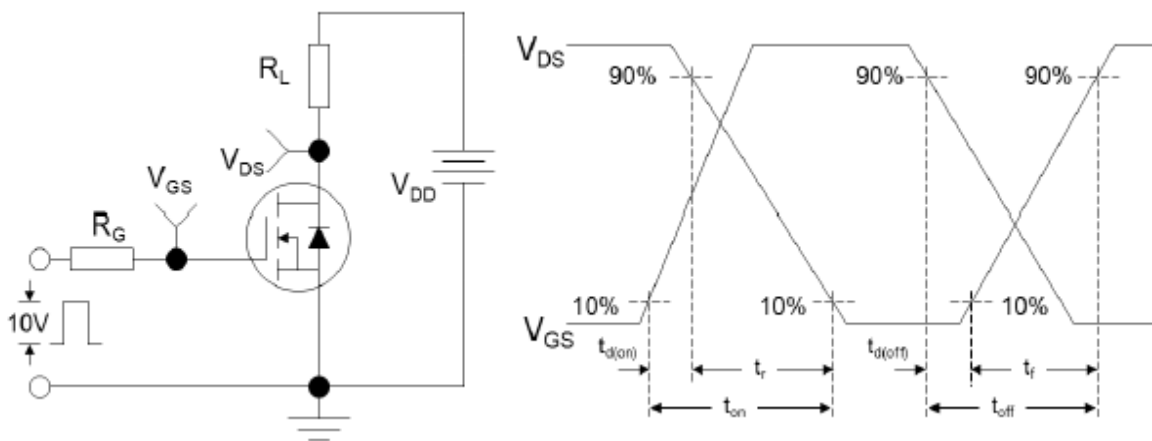


Figure 2: Resistive Switching Test Circuit & Waveforms

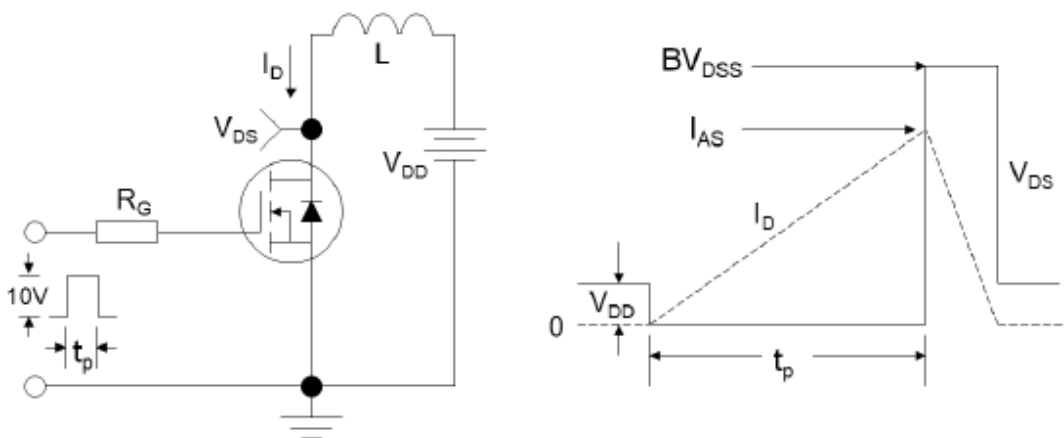
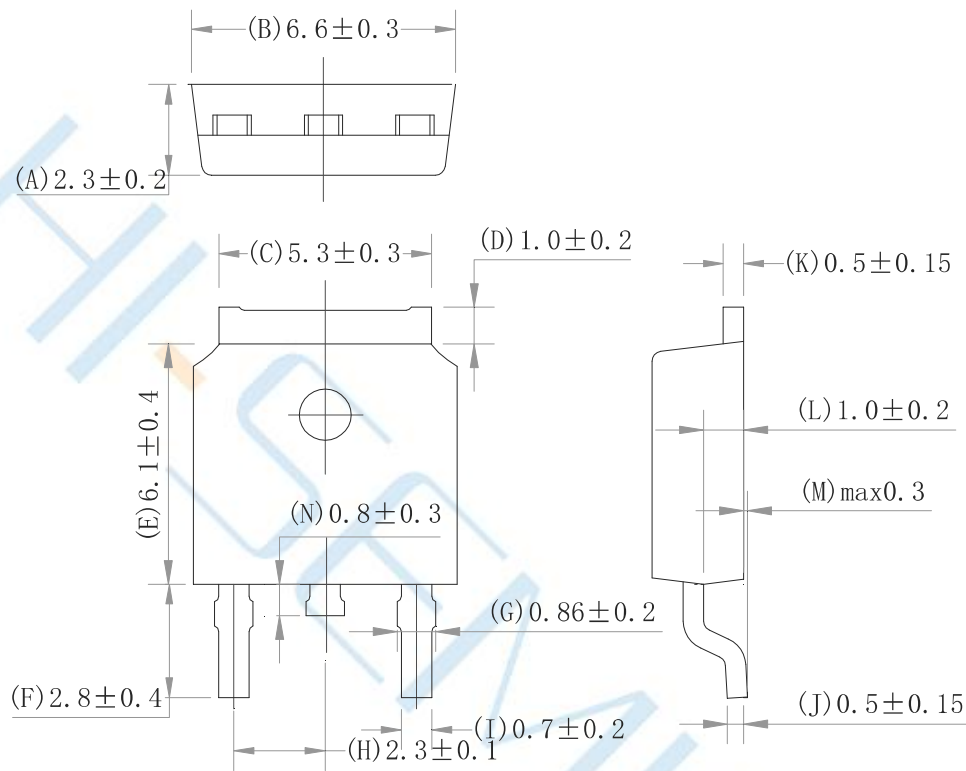


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

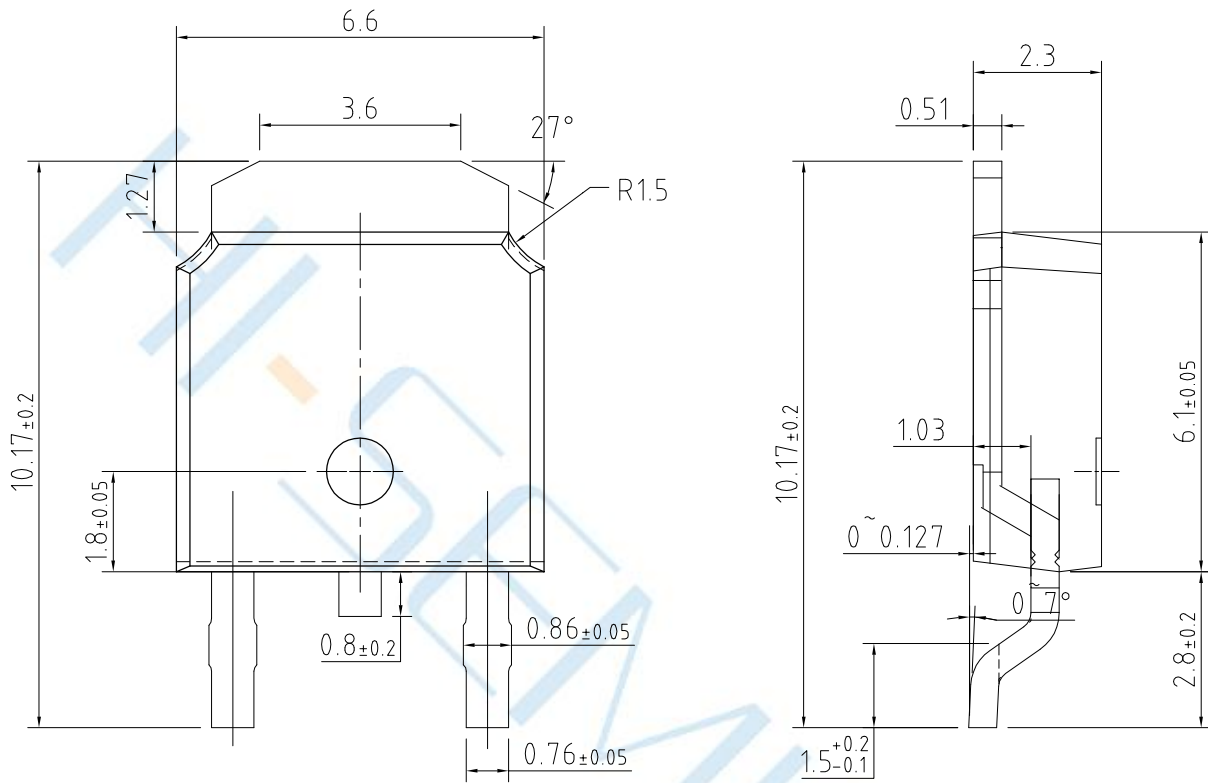
Package Dimensions of TO-252-2L

Unit:mm



Package Dimensions of TO-252-2L

Unit:mm



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