

110A, 55V N-CHANNEL POWER MOSFET

GENERAL DESCRIPTION

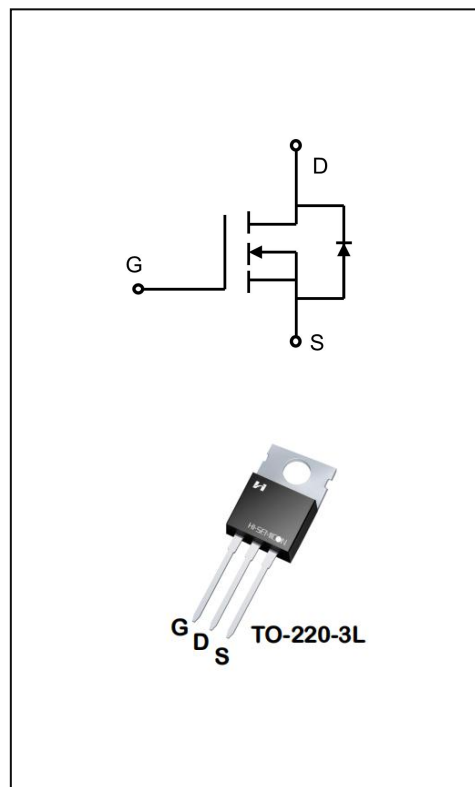
The SFP110N55 uses advanced Process technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety applications.

Features

- ◆ $V_{DS}=55V, I_D=110A$
- ◆ $R_{DS(on)}$
TYP: $7.5m\Omega @ V_{GS}=10V, I_D=50A$

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
SFP110N55	TO-220-3L	SFP110N55	Pb Free	Tube

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

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V _{DS}	55	V
Gate-Source Voltage		V _{GS}	±20	V
Drain Current	T _C = 25°C	I _D	110	A
	T _C = 100°C		75	
Drain Current Pulsed(Note 1)		I _{DM}	400	A
Power Dissipation(T _C =25°C) -Derate above 25°C		P _D	195	W
			1.3	W/°C
Single Pulsed Avalanche Energy (Note 2)		E _{AS}	311	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}	0.8	°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	55	--	--	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =55V, V _{GS} =0V	--	--	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =20V, V _{DS} =0V	--	--	100	nA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =-20V, V _{DS} =0V	--	--	-100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _D =250μA	2.0	2.9	4.0	V
Static Drain- Source On State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =50A	--	7.5	10	mΩ
Dynamic Characteristics						
Gate Resistance	R _g	V _{GS} =0V; f=1.0MHZ	1	1.9	10	Ω
Input Capacitance	C _{iss}	V _{DS} =25V V _{GS} =0V f=1.0MHZ	--	3300	--	pF
Output Capacitance	C _{oss}		--	746	--	
Reverse Transfer Capacitance	C _{rss}		--	152	--	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =28V; V _{GS} =10V R _G =3.3Ω; I _D =50A (Note 3.4)	--	21.1	--	ns
Turn-on Rise Time	t _r		--	124.3	--	
Turn-off Delay Time	t _{d(off)}		--	35.1	--	
Turn-off Fall Time	t _f		--	12.7	--	

Total Gate Charge	Q_g	$V_{DS}=44V, I_D=62A$ $V_{GS}=10V$ (Note 3.4)	--	88	--	nc
Gate-Source Charge	Q_{gs}		--	26	--	
Gate-Drain Charge	Q_{gd}		--	41	--	

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	--	--	110	A
Pulsed Source Current	I_{SM}		--	--	440	
Diode Forward Voltage	V_{SD}	$I_S=50A, V_{GS}=0V$	--	0.82	1.	V
Reverse Recovery Time	T_{rr}	$I_F=50A, V_R=15V,$ $dI/dt=100A/\mu S$	--	49.6	--	ns
Reverse Recovery Charge	Q_{rr}		--	83.8	--	μC

1. Pulse width limited by maximum junction temperature
2. $L=0.2mH, V_{DD}=25V, V_G=10V, R_G=25\Omega$, 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

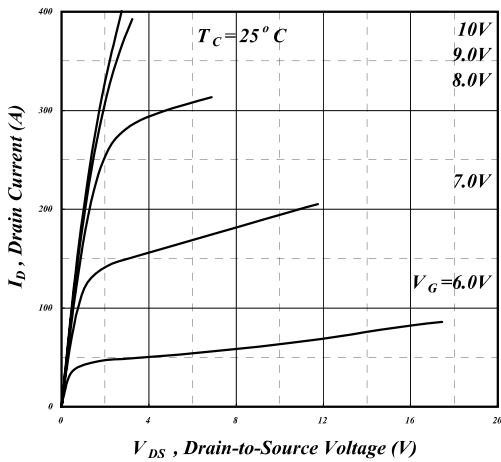


Fig 1. Typical Output Characteristics

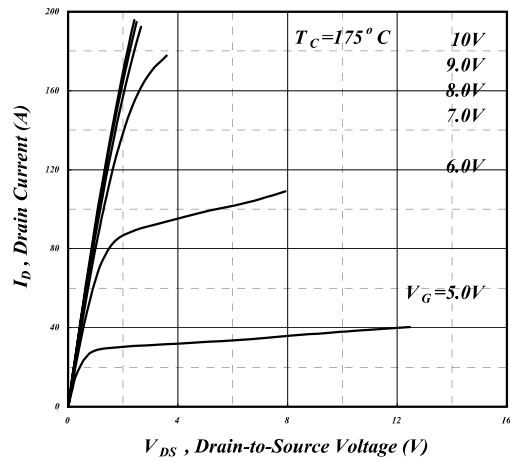


Fig 2. Typical Output Characteristics

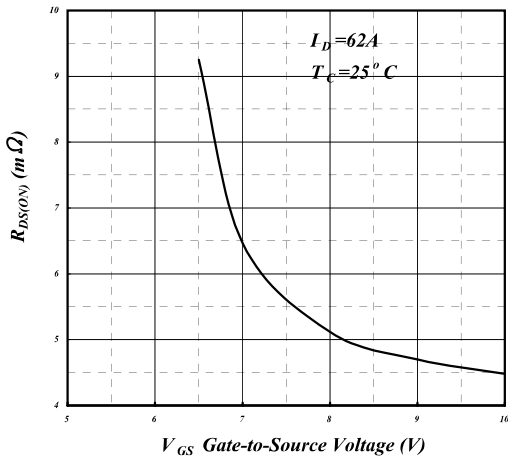


Fig 3. On-Resistance v.s. Gate Voltage

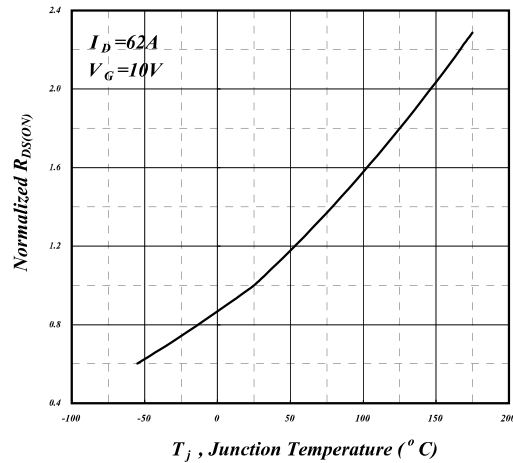


Fig 4. Normalized On-Resistance v.s. Junction Temperature

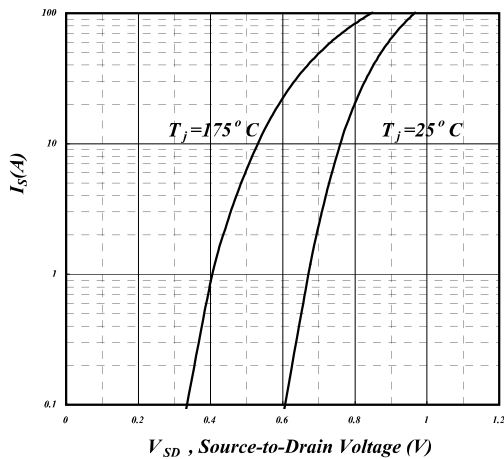


Fig 5. Forward Characteristic of Reverse Diode

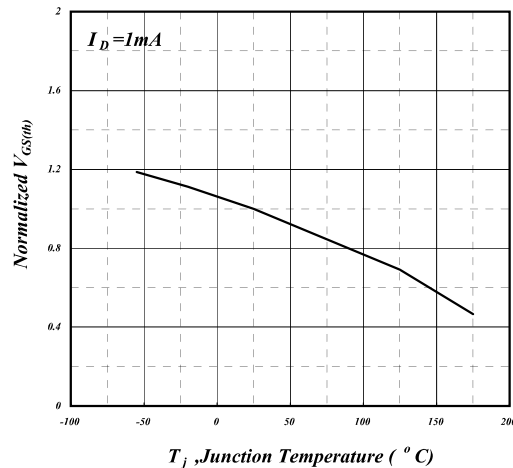


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

Typical Performance Characteristics

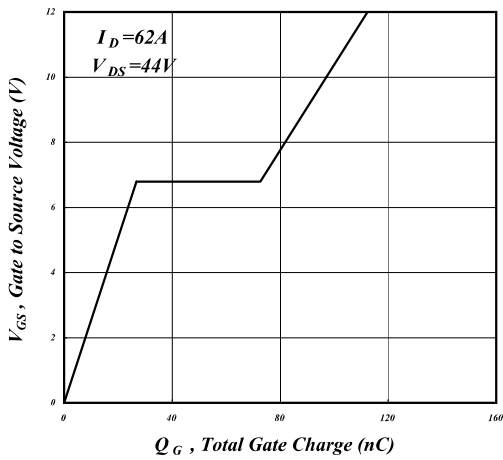


Fig 7. Gate Charge Characteristics

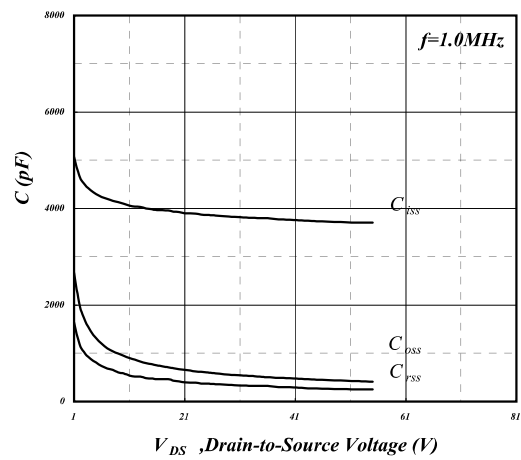


Fig 8. Typical Capacitance Characteristics

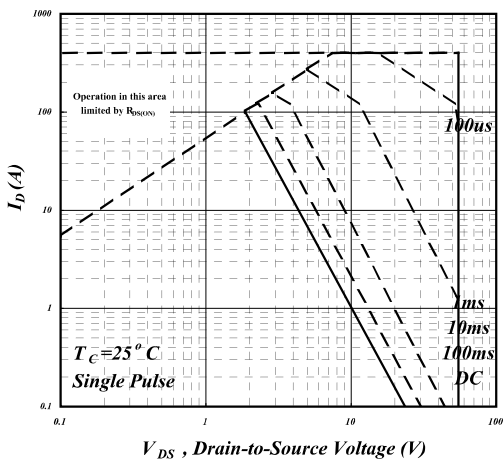


Fig 9. Maximum Safe Operating Area

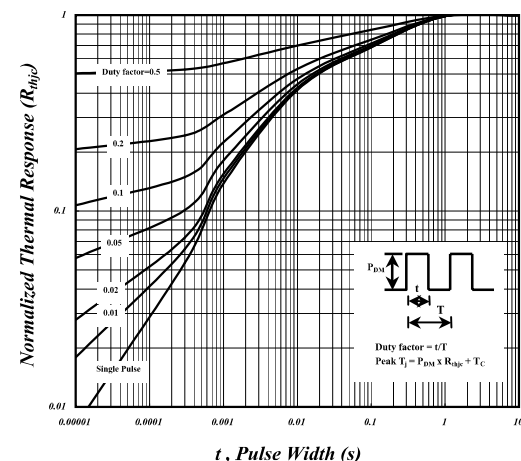


Fig 10. Effective Transient Thermal Impedance

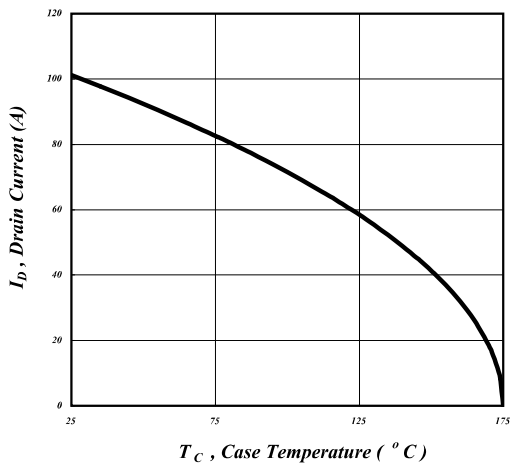


Fig 11. Drain Current v.s. Case Temperature

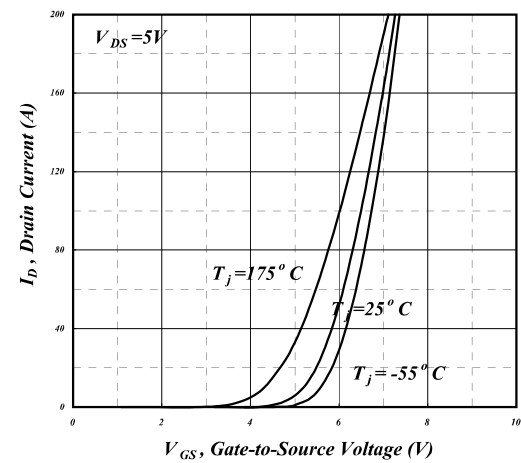


Fig 12. Transfer Characteristics

Typical Performance Characteristics

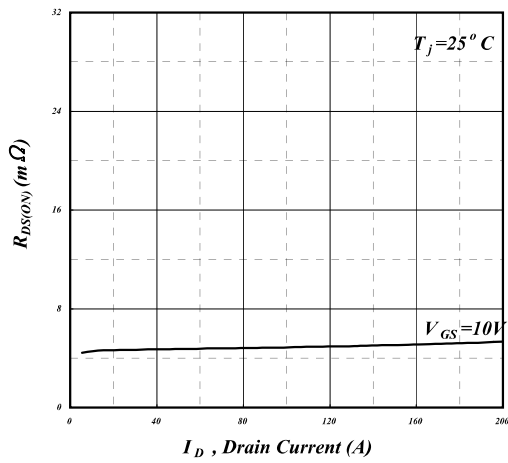


Fig 13. Typ. Drain-Source on State Resistance

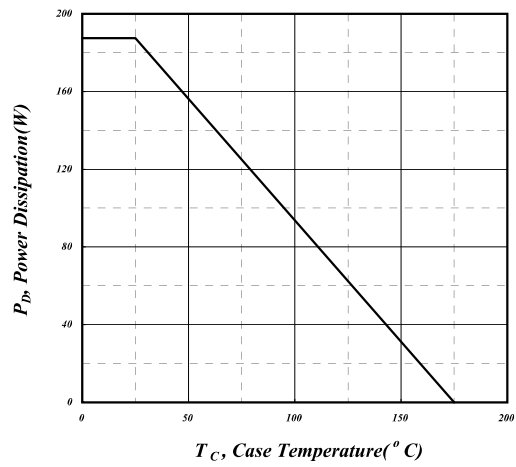


Fig 14. Total Power Dissipation

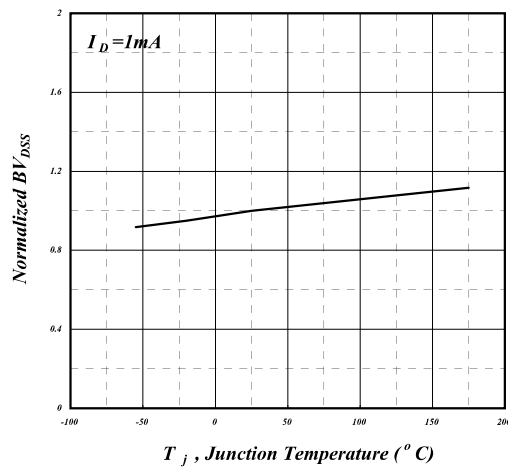
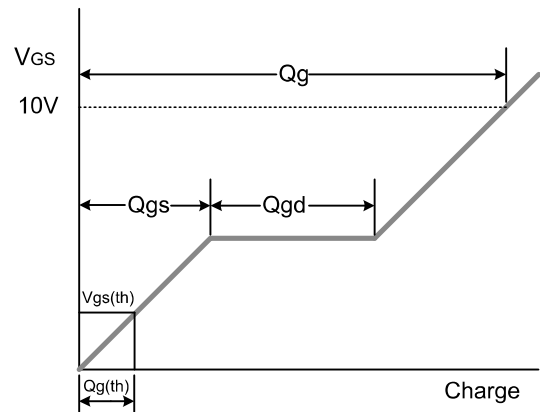
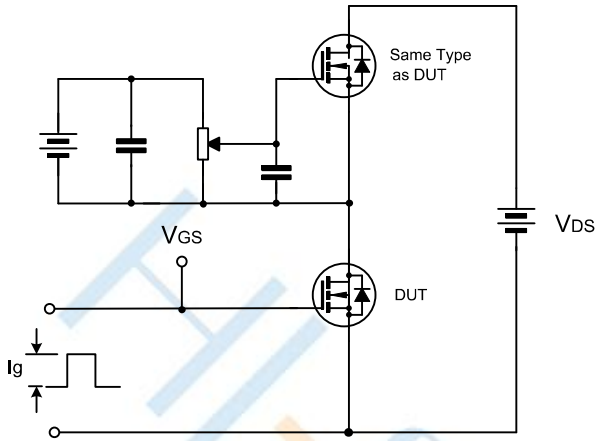
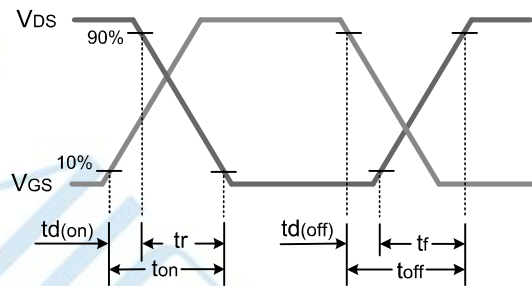
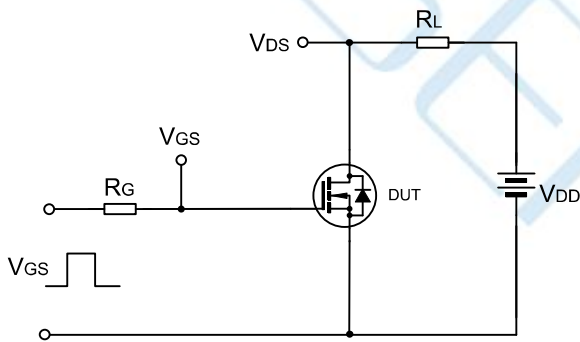


Fig 15. Normalized BV_{DSS} v.s. Junction

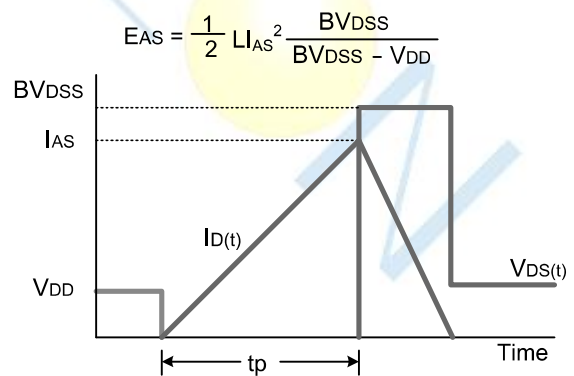
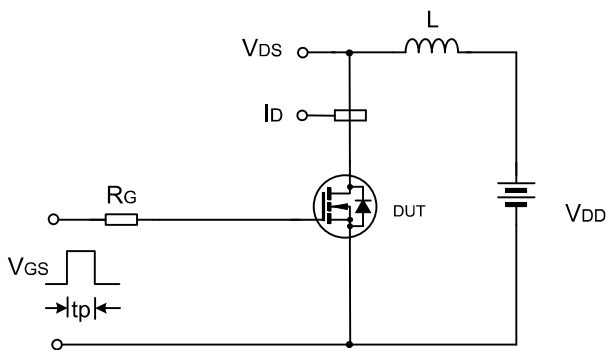
Test Circuit



Gate Charge Test Circuit & Waveform



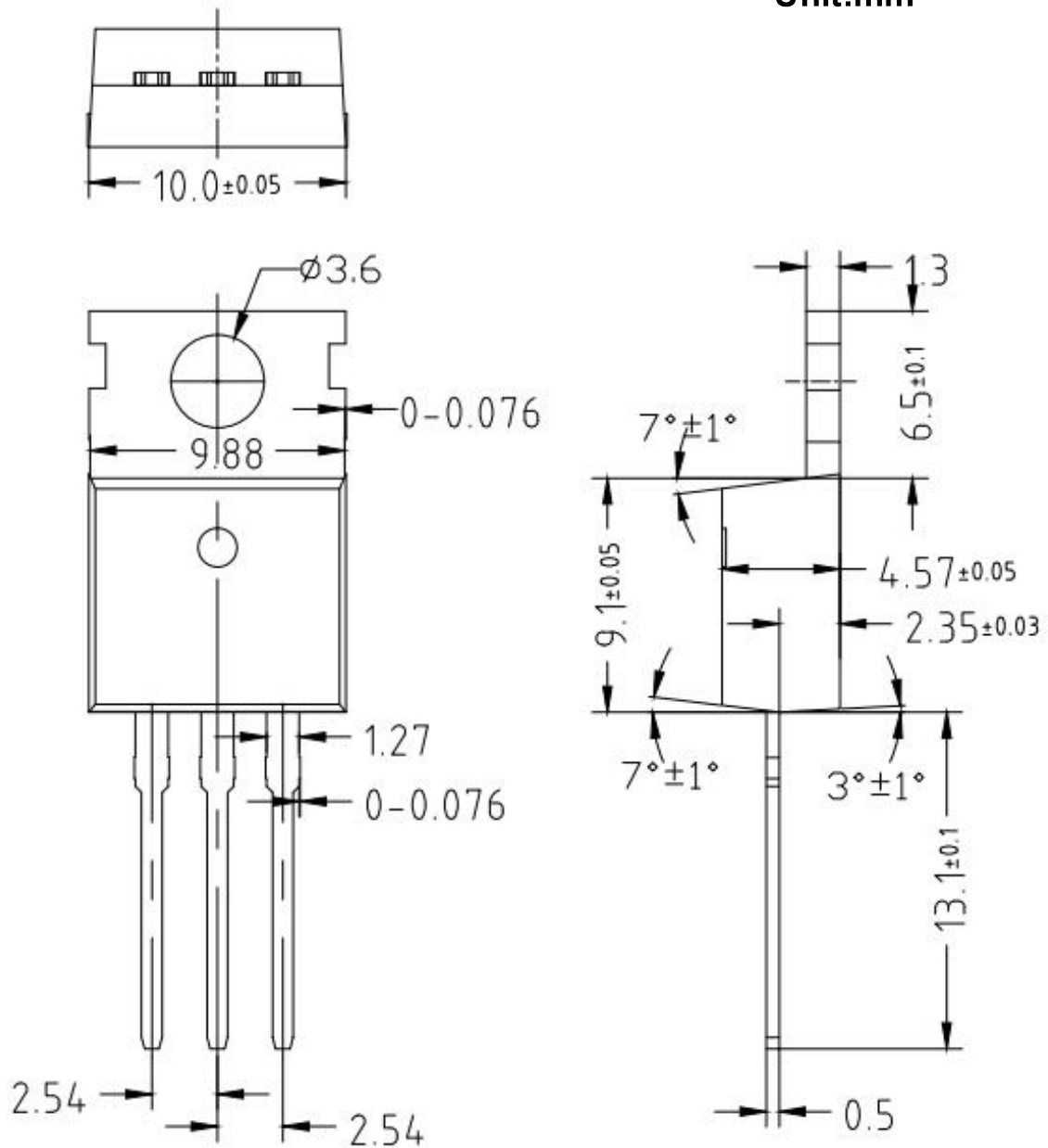
Resistive Switching Test Circuit & Waveform



EAS Test Circuit & Waveform

Package Dimensions of TO-220-3L

Unit:mm



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