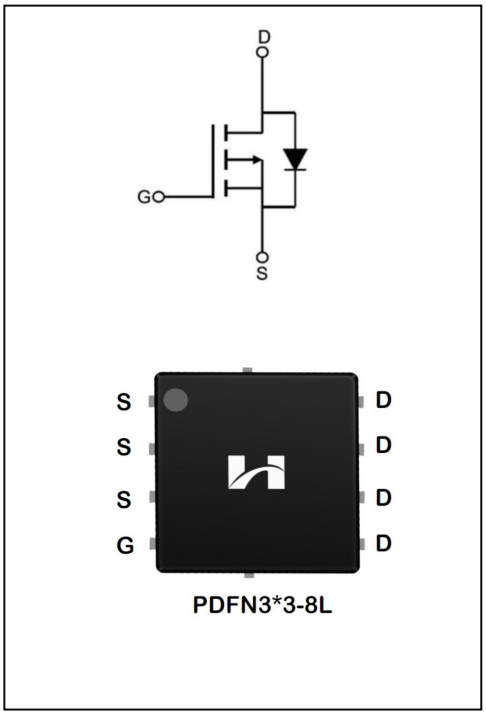
-30V, -50A P-CHANNEL POWER MOSFET



GENERAL DESCRIPTION

The SFN3005PT use 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=-50A
- ◆$R_{DS(on)}$
  - TYP:9.2mΩ@V_{GS}=-10V
  - MAX:11mΩ

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
SFN3005PT	PDFN3*3-8L	SFN3005PT	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	-50	A
	T_C = 100°C		-35	
Drain Current Pulsed (Note 1)		I_{DM}	-200	A
Power Dissipation(T_C=25°C)		P_D	29.7	W
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	$R_{\theta JC}$	4.2	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	75	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain -Source Breakdown Voltage	B_{VDSS}	V_{GS}=0V, I_D=-250μA	-30	--	--	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V	--	--	1.0	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	
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}= V_{DS}, I_D=-250μA	-1.0	-1.5	-2.5	V
Static Drain- Source On State Resistance	$R_{DS(on)}$	V_{GS}=-10V, I_D=-10A	--	9.2	11	mΩ
	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-10A	--	13.5	16	
Dynamic Characteristics						
Gate Resistance	Rg	V_{GS}=0V; f=1.0MHZ	1	4.5	10	Ω
Input Capacitance	C_{iss}	V_{DS}=-15V V_{GS}=0 f=1.0MHZ	--	2202	--	pF
Output Capacitance	C_{oss}		--	260.3	--	
Reverse Transfer Capacitance	C_{rss}		--	239.6	--	
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V, V_{GS}=-10V R_G=1.0Ω, I_D=-10.0A (Note 2.3)	--	11.2	--	ns
Turn-on Rise Time	t_r		--	6.4	--	
Turn-off Delay Time	$t_{d(off)}$		--	75.8	--	
Turn-off Fall Time	t_f		--	14.8	--	

Total Gate Charge	Q_g	V_{DS}=-15V, I_D=-10.0A	--	39.2	--	nc
Gate-Source Charge	Q_{gs}	V_{GS}=-10V	--	5.6	--	
Gate-Drain Charge	Q_{gd}	(Note 2.3)	--	7.4	--	

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	--	--	-50	A
Pulsed Source Current	I_{SM}		--	--	-200	
Diode Forward Voltage	V_{SD}	I_S=-20A,V_{GS}=0V	--	--	1.4	V

1.Pulse width limited by maximum junction temperature

2.Pulse Test: Pulse width ≤300μs, Duty cycle≤2%

3.Essentially independent of operating temperature

Typical Performance Characteristics

Fig 1: Output Characteristics

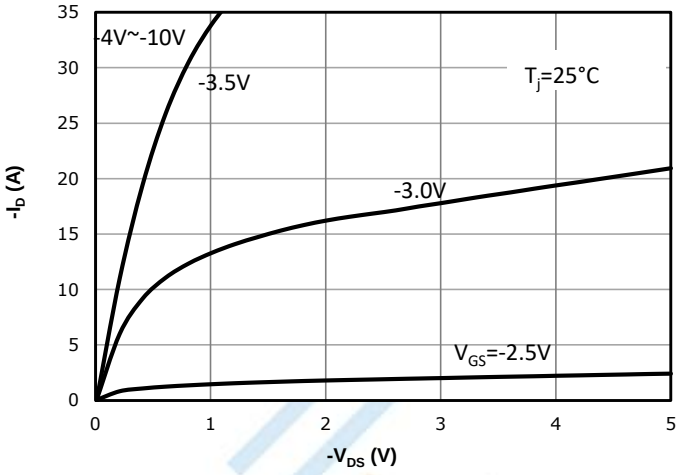


Fig 2: Transfer Characteristics

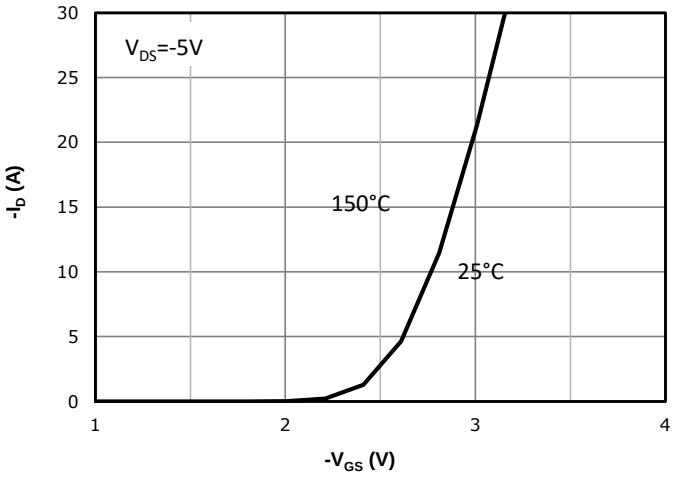


Fig 3: Rds(on) vs Drain Current and Gate Voltage

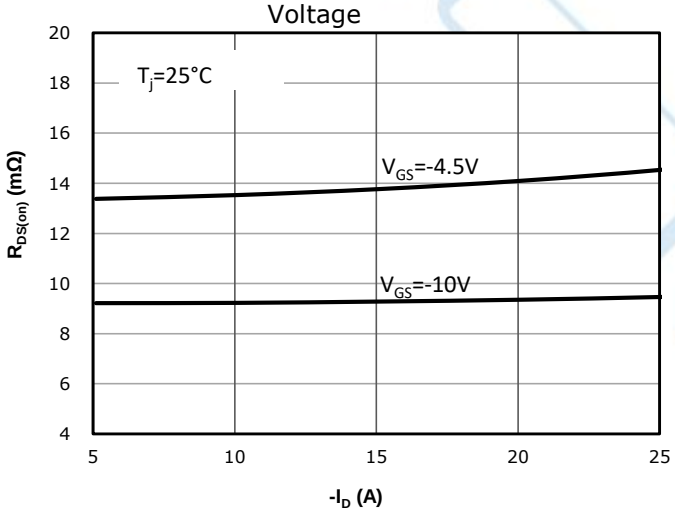


Fig 4: Rds(on) vs Gate Voltage

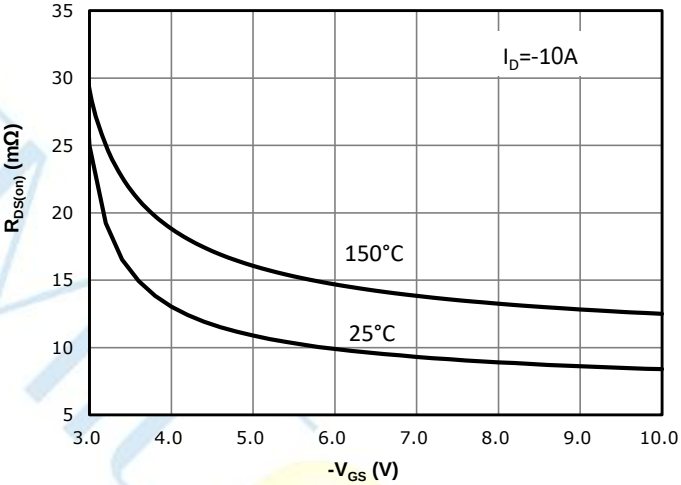


Fig 5: Rds(on) vs. Temperature

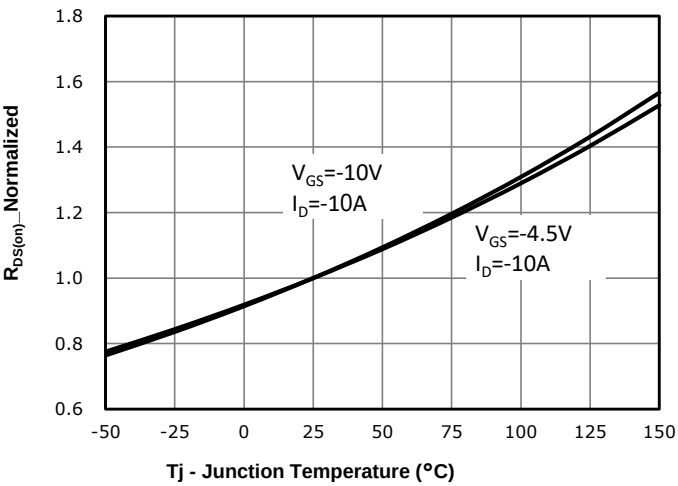
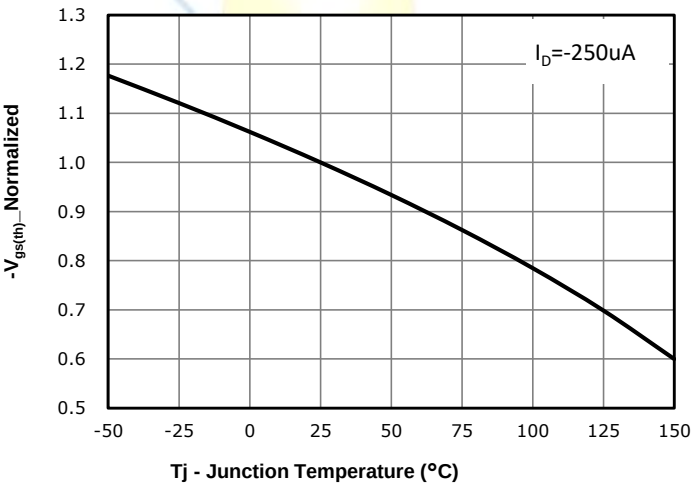


Fig 6: Vgs(th) vs. Temperature



Typical Performance Characteristics

Fig 7: BVdss vs. Temperature

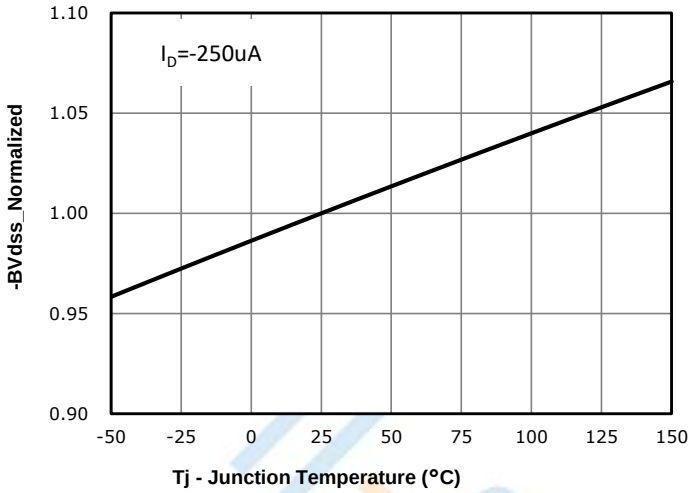


Fig 8: Body-diode Forward Characteristics

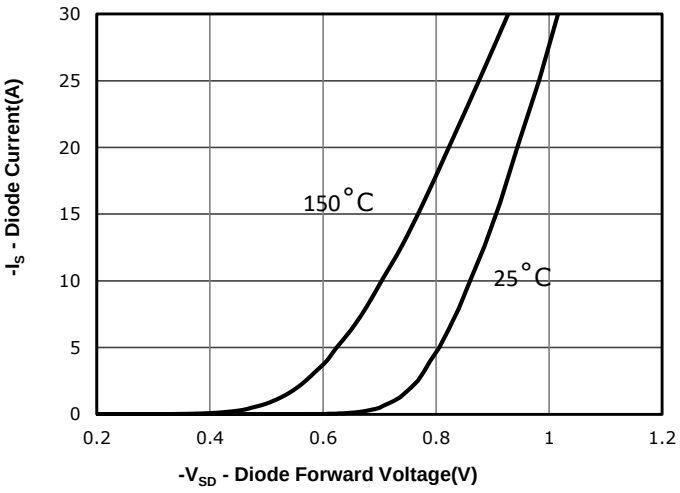


Fig 9: Gate Charge Characteristics

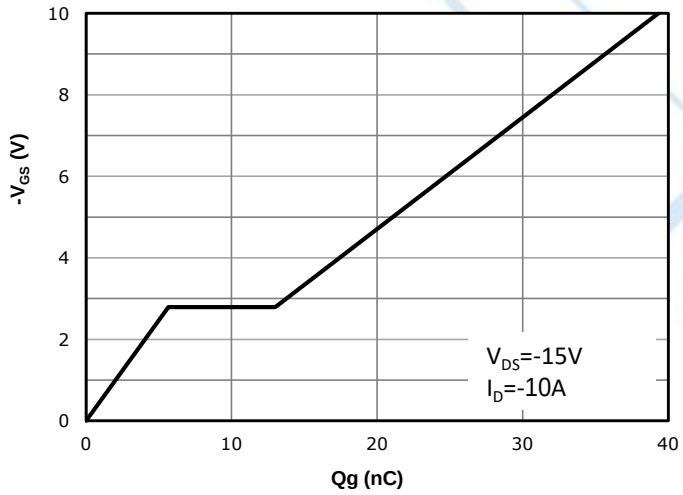


Fig 10: Capacitance Characteristics

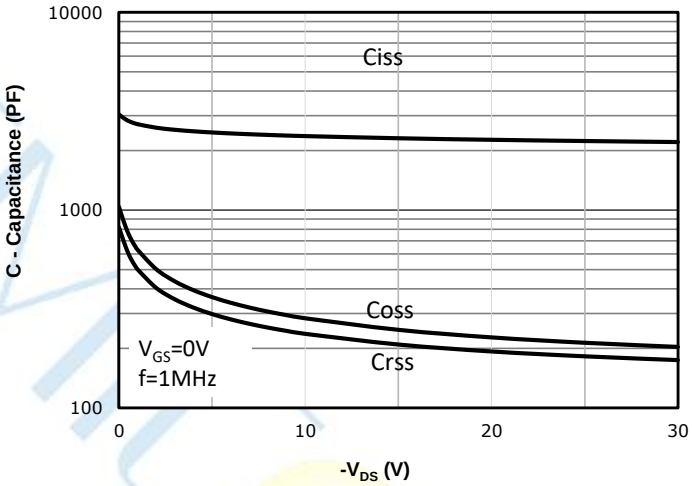


Fig 11: Drain Current Derating

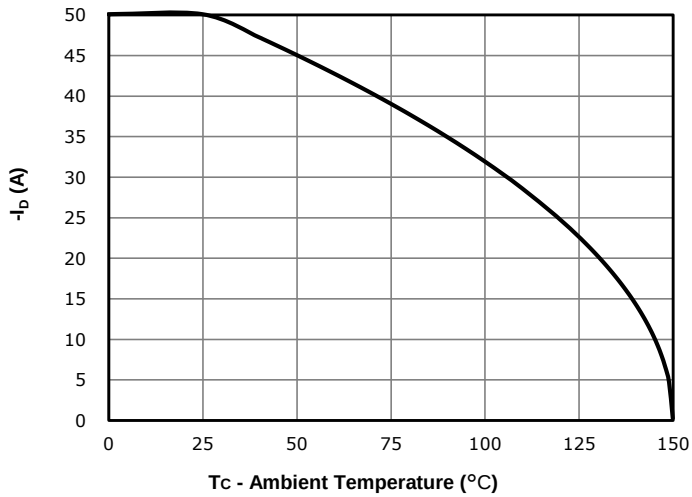
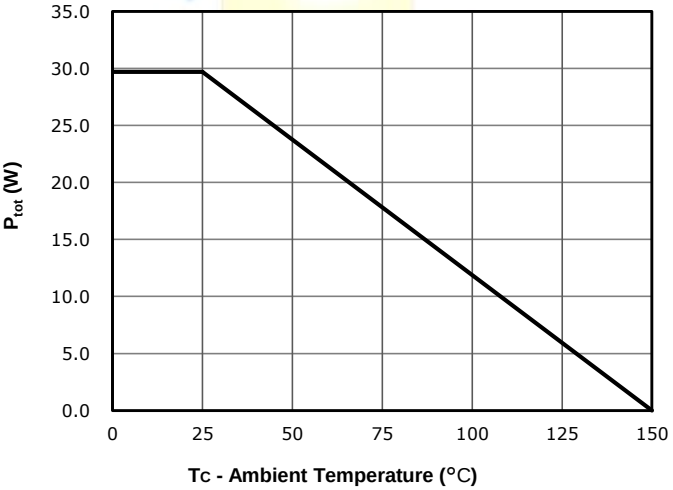
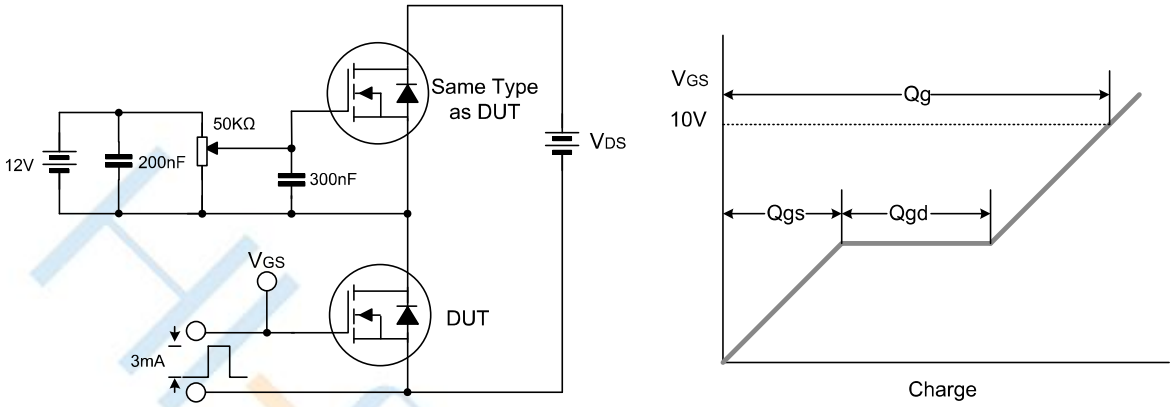


Fig 12: Power Dissipation

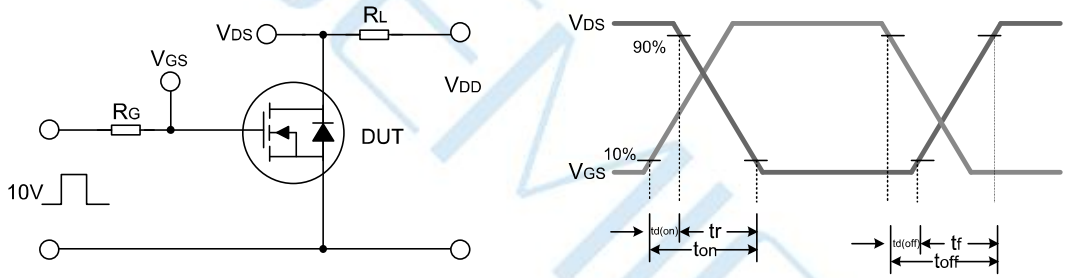


Test Circuit

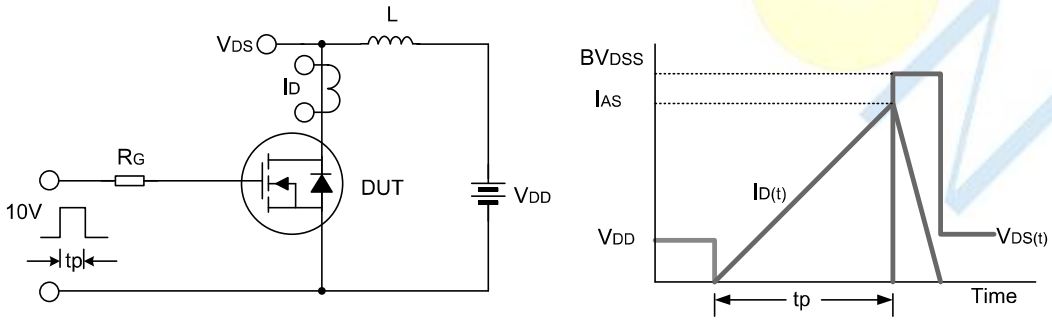
Gate Charge Test Circuit & Waveform



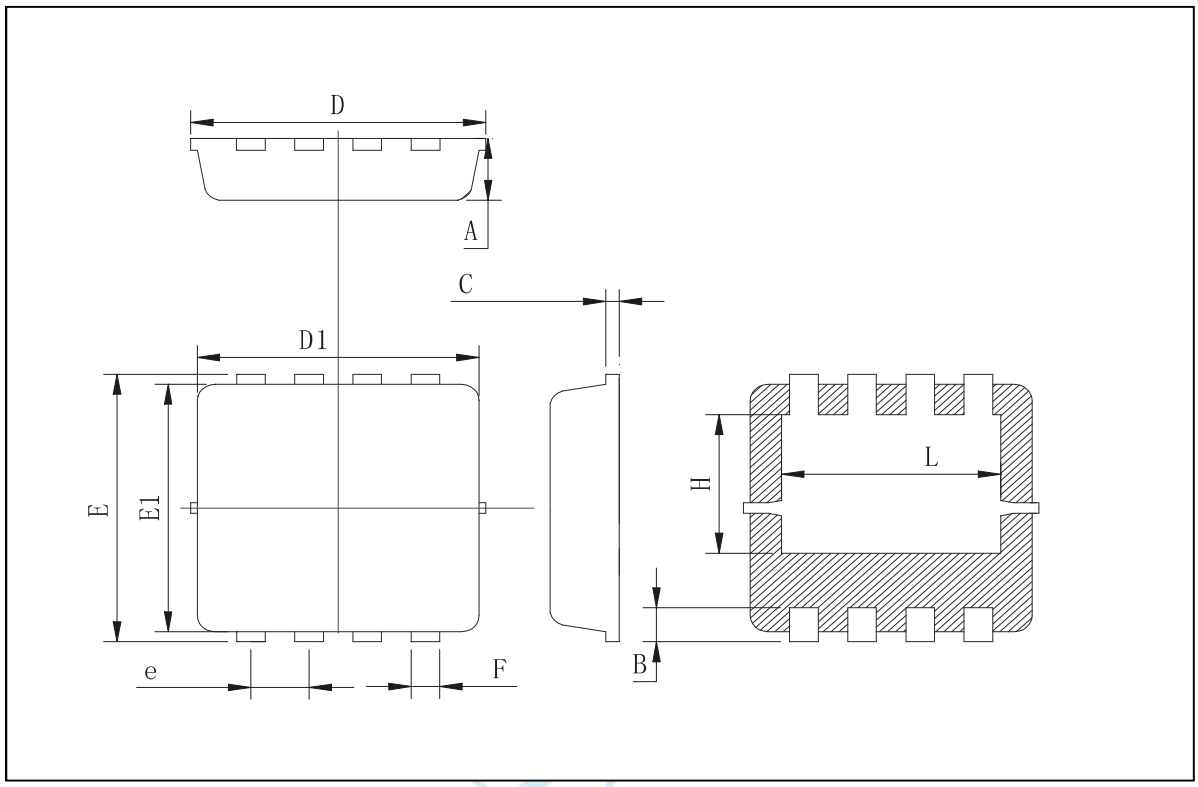
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



Package Dimensions of PDFN3*3-8L



Unit:mm

Symbol	Min	Typ	Max
A	0.725	0.775	0.825
B	0.28	0.38	0.48
C	0.13	0.15	0.20
D	3.20	3.30	3.35
D1	3.05	3.15	3.25
E	3.25	3.35	3.45
E1	3.0	3.1	3.2
e	0.60	0.65	0.70
F	0.27	0.32	0.37
H	1.63	1.73	1.83
L	2.35	2.45	2.55

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