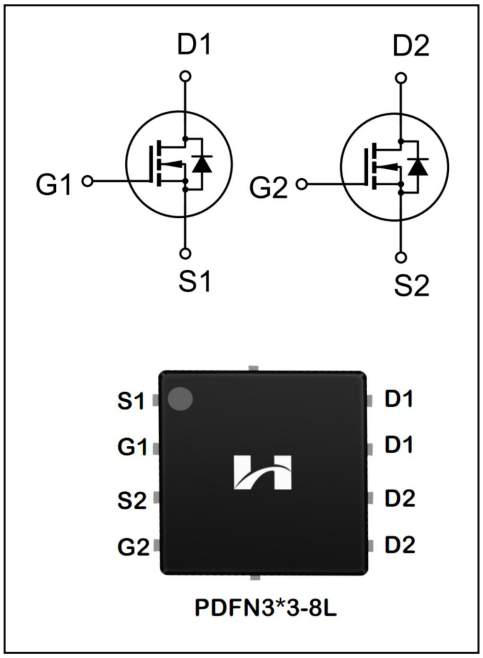
30V, 30A DUAL N-CHANNEL POWER MOSFET

GENERAL DESCRIPTION

The SFN0330T2 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=30A
- ◆$R_{DS(on)}$
  TYP:8.3mΩ@V_{GS}=10V

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
SFN0330T2	PDFN3*3-8L	SFN0330T2	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	30	A
	T_C = 100°C		21.5	
Drain Current Pulsed(Note 1)		I_{DM}	120	A
Power Dissipation(T_C=25°C) -Derate above 25°C		P_D	32	W
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	81	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	℃

THERMAL CHARACTERISTICS

Characteristics	Symbol	MAX	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.15	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	43.5	°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	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	1.2	1.45	1.8	V
Static Drain- Source On State Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=15A	--	8.3	10.5	mΩ
		V_{GS}=4.5V, I_D=10A	--	12.0	16.5	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=15V V_{GS}=0V f=1.0MHZ	--	853	--	pF
Output Capacitance	C_{oss}		--	165	--	
Reverse Transfer Capacitance	C_{rss}		--	130	--	
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V, R_G=10Ω I_D=15A (Note 3.4)	--	7.3	--	ns
Turn-on Rise Time	t_r		--	6.2	--	
Turn-off Delay Time	$t_{d(off)}$		--	25.6	--	
Turn-off Fall Time	t_f		--	8.5	--	
Total Gate Charge	Q_g	V_{DS}=15V, I_D=15A V_{GS}=10V (Note 3.4)	--	18.1	--	nc
Gate-Source Charge	Q_{gs}		--	5.3	--	
Gate-Drain Charge	Q_{gd}		--	6.5	--	

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	--	--	30	A
Pulsed Source Current	I_{SM}		--	--	120	
Diode Forward Voltage	V_{SD}	IS=15A,VGS=0V	--	0.83	1.2	V
Reverse Recovery Time	T_{rr}	IF=15A dIF/dt=100A/μS	--	18.3	--	ns
Reverse Recovery Charge	Q_{rr}		--	11	--	nC

1.Pulse width limited by maximum junction temperature

2.L=0.5mH, V_{DD}=20V, V_G=10V, R_G=25Ω, starting T_J=25°C

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

4.Essentially independent of operating temperature

Typical Performance Characteristics

Figure 1. Output Characteristics

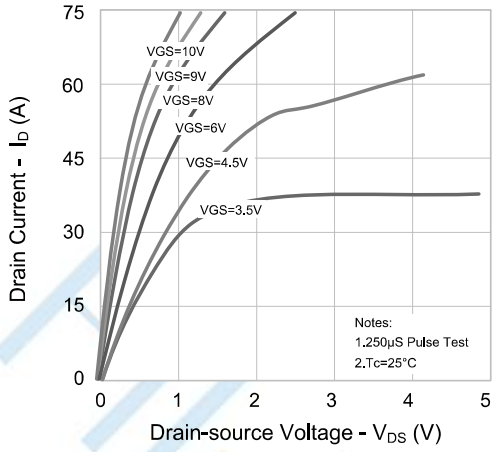


Figure 2. Transfer Characteristics

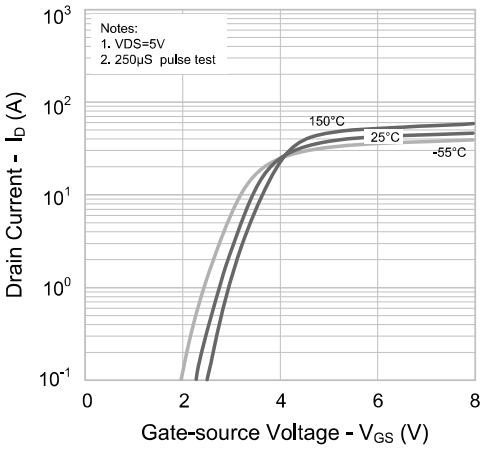


Figure 3. On-resistance vs. Drain Current

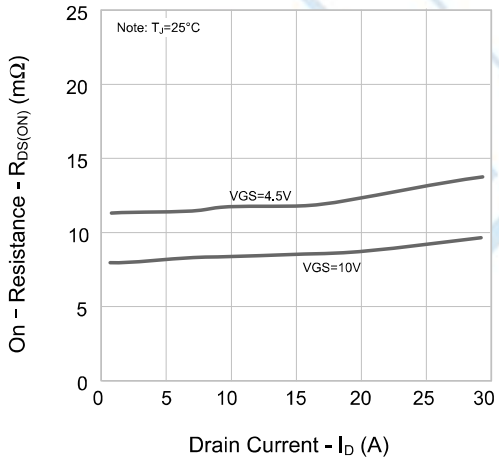


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

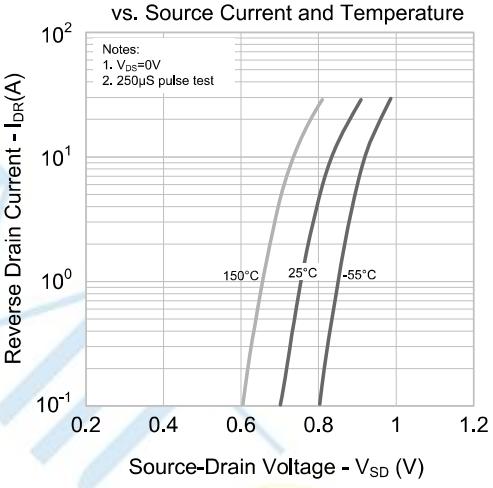


Figure 5. Capacitance Characteristics

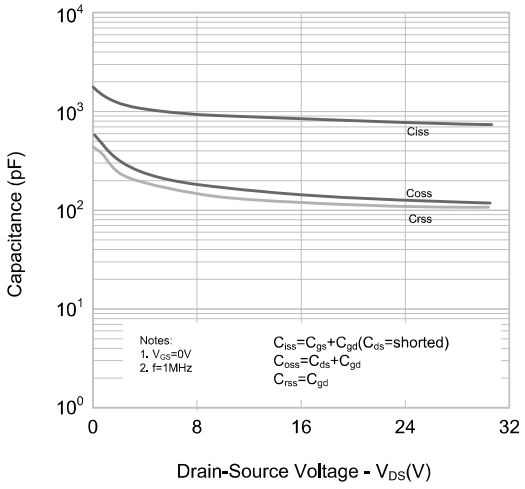
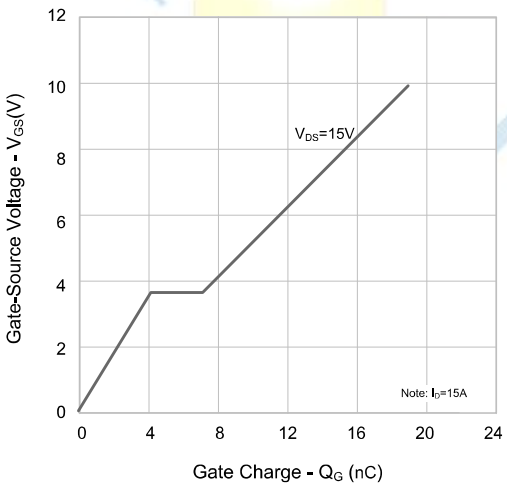


Figure 6. Gate Charge



Typical Performance Characteristics

Figure 7. Breakdown Voltage vs. Temperature Characteristics

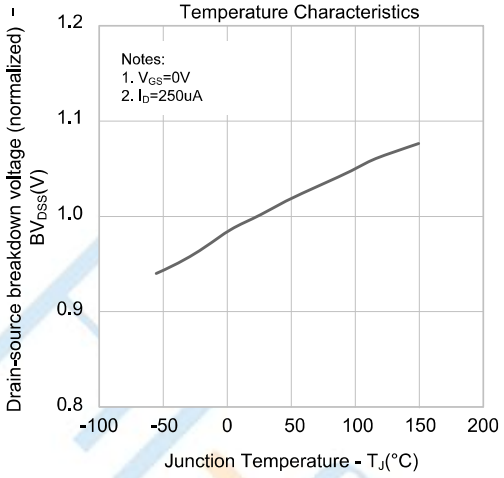


Figure 8. On-resistance vs. Temperature Characteristics

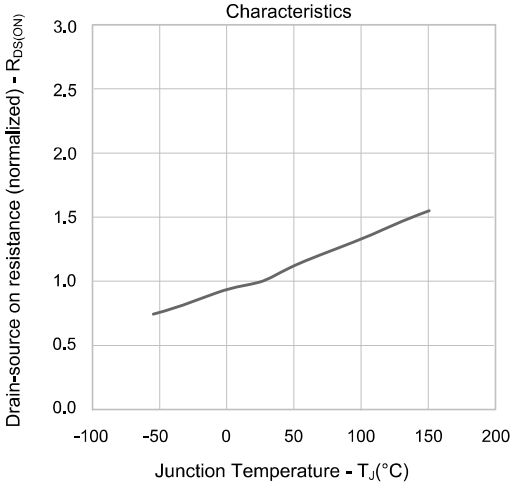
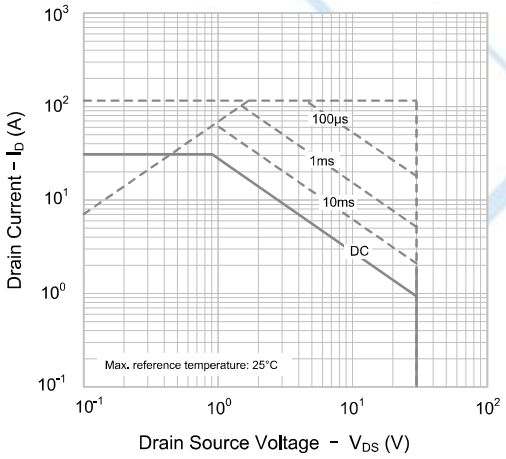
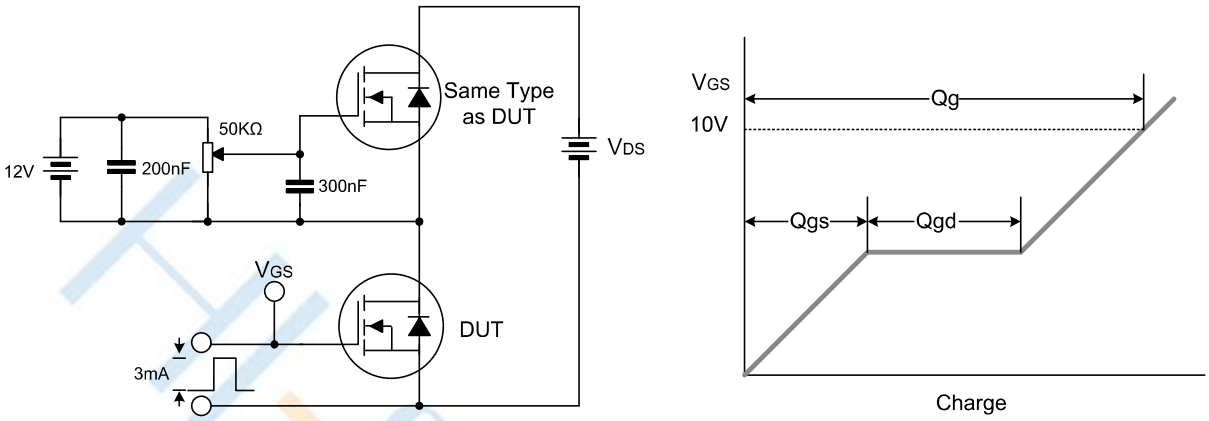


Figure 9. Max. Safe Operating Area

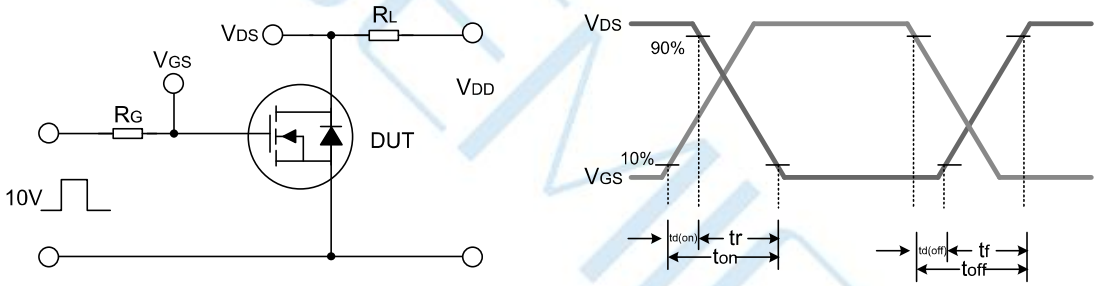


Test Circuit

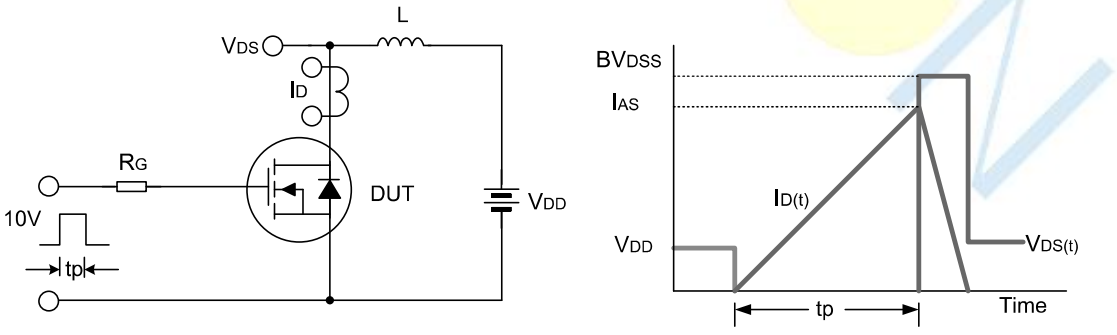
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform

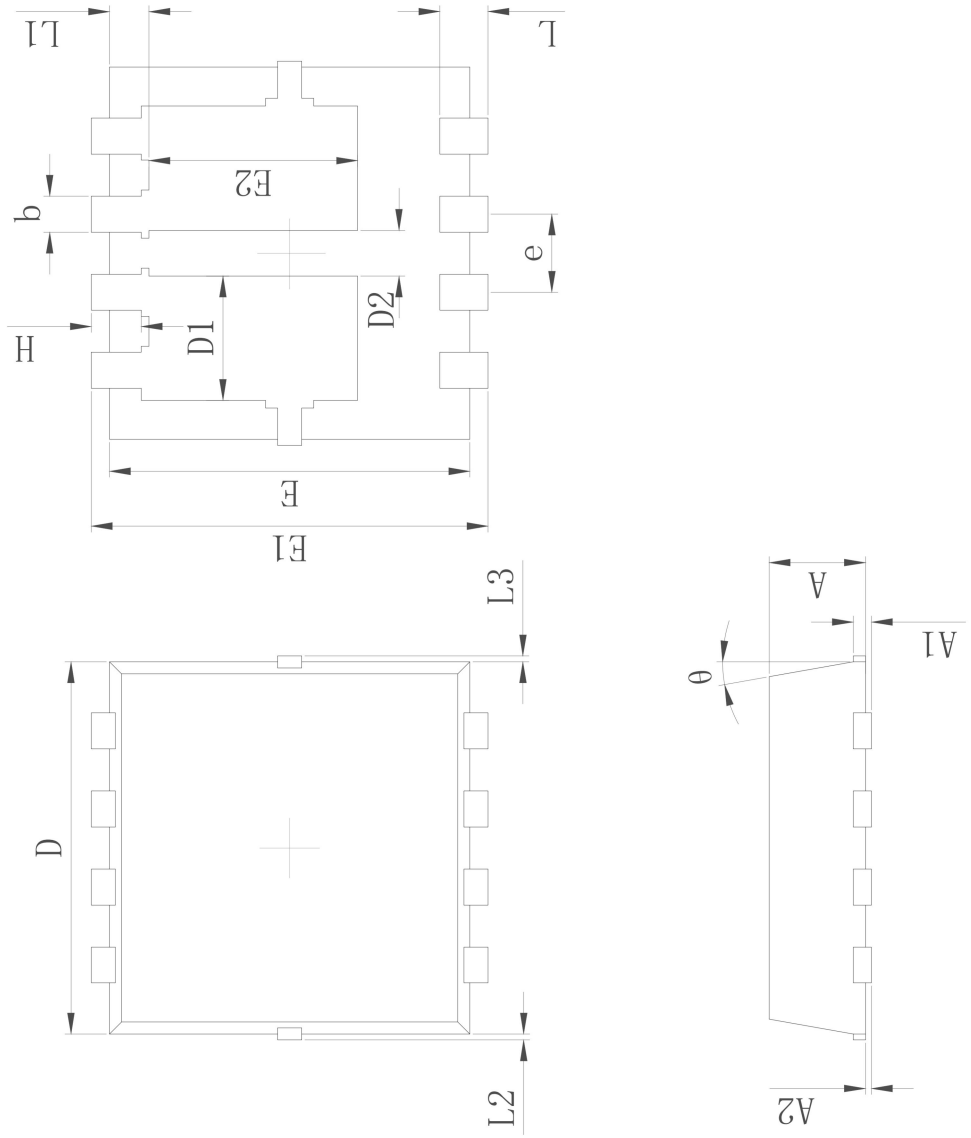


Unclamped Inductive Switching Test Circuit & Waveform



Package Dimensions of PDFN3*3-8L

SYMBOL	MILLIMETER	
	MIN	MAX
A	0.700	0.900
A1	0.152 REF.	
A2	0~0.05	
D	3.000	3.200
D1	0.935	1.135
D2	0.280	0.480
E	2.900	3.100
E1	3.150	3.450
E2	1.535	1.935
b	0.200	0.400
e	0.550	0.750
L	0.300	0.500
L1	0.180	0.480
L2	0~0.100	
L3	0~0.100	
H	0.315	0.515
θ	8°	12°



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