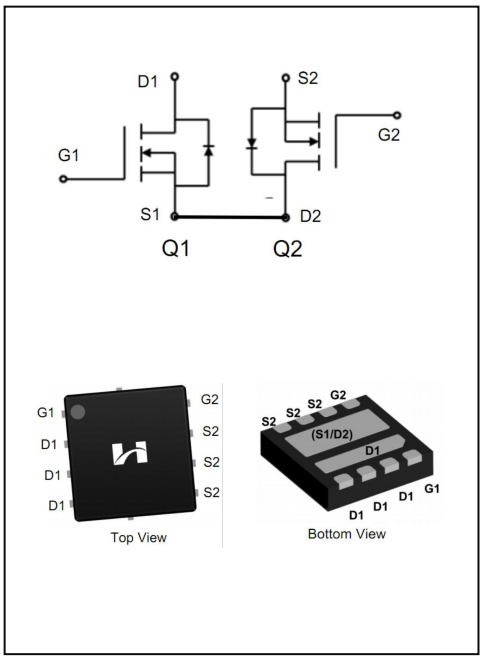
20V, 13A DUAL N-CHANNEL POWER MOSFET

GENERAL DESCRIPTION

The SFN0213T2 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}=20V,I_D=13A
- ◆$R_{DS(on)}$
  TYP:6.0mΩ@V_{GS}=4.5V

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
SFN0213T2	DFN3*3-8L	SFN0213T2	Pb Free	Reel

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

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±12	V
Drain Current	T_C = 25°C	I_D	13	A
	T_C = 100°C		9.1	
Drain Current Pulsed(Note 1)		I_{DM}	52	A
Power Dissipation(T_C=25°C)		P_D	1.86	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	℃

THERMAL CHARACTERISTICS

Characteristics	Symbol	MAX	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	67	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	80	°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	20	--	--	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	--	--	1.0	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=12V, V_{DS}=0V	--	--	100	nA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=-12V, V_{DS}=0V	--	--	-100	
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}= V_{DS}, I_D=250μA	0.5	0.65	0.9	V
Static Drain- Source On State Resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=6A	--	6.0	7.0	mΩ
		V_{GS}=3.8V, I_D=5A	--	6.3	8.0	
		V_{GS}=2.5V, I_D=5A	--	7.1	9.0	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=15V	--	1767	--	pF
Output Capacitance	C_{oss}	V_{GS}=0V	--	164	--	
Reverse Transfer Capacitance	C_{rss}	f=1.0MHZ	--	155	--	
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=16V, R_G=6Ω	--	11.2	--	ns
Turn-on Rise Time	t_r	I_D=6.5A	--	42	--	
Turn-off Delay Time	$t_{d(off)}$	(Note 2.3)	--	68	--	
Turn-off Fall Time	t_f		--	32	--	
Total Gate Charge	Q_g	V_{DS}=16V, I_D=13A	--	24	--	nc
Gate-Source Charge	Q_{gs}	V_{GS}=4.5V	--	3.7	--	
Gate-Drain Charge	Q_{gd}	(Note 2.3)	--	8.6	--	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	Integral Reverse P-NJunction Diode in the MOSFET	--	--	13	A
Pulsed Source Current	I_{SM}		--	--	52	
Diode Forward Voltage	V_{SD}	I_S=6A,V_{GS}=0V	--	--	1.4	V
Reverse Recovery Time	T_{rr}	I_F=13A dIF/dt=100A/μS	--	48	--	ns
Reverse Recovery Charge	Q_{rr}		--	10.9	--	μC

1.Pluse 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 Typical Output Characteristics

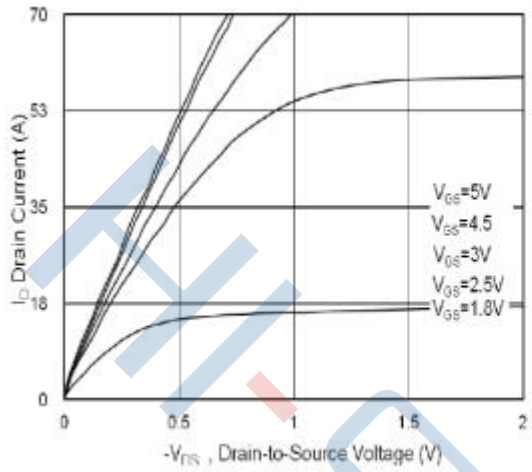


Fig.2 On-Resistance vs.Gate-Source

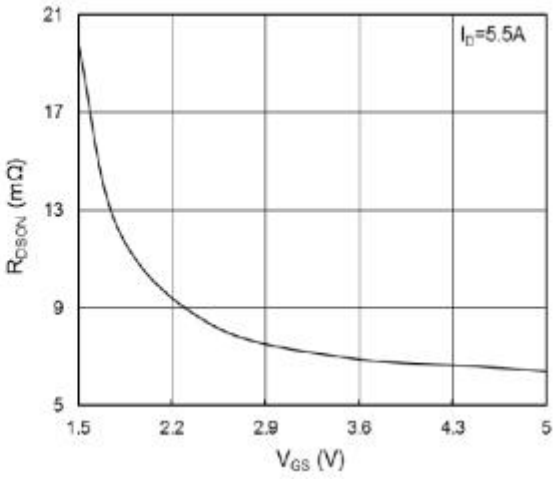


Fig.3 Forward Characteristics of Reverse

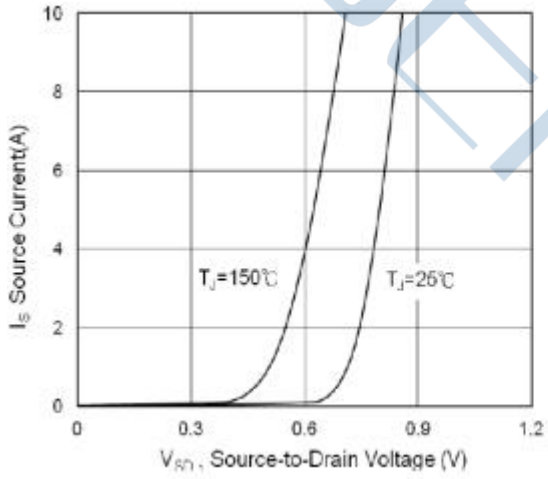


Fig.4 Gate-Charge Characteristics

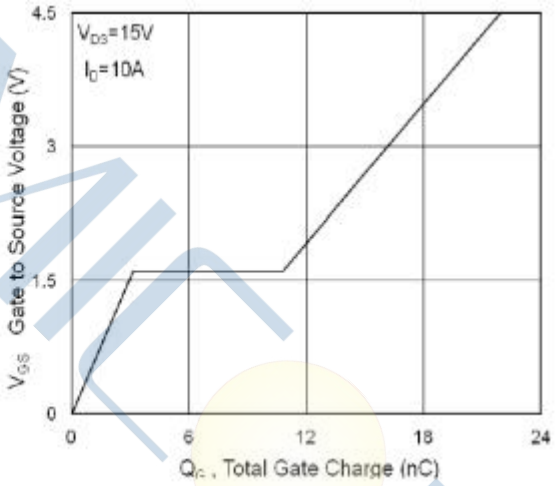


Fig.5 VGS(th)vs.TJ

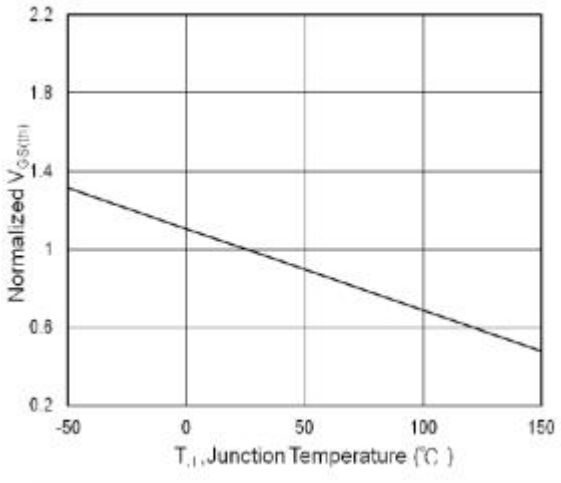
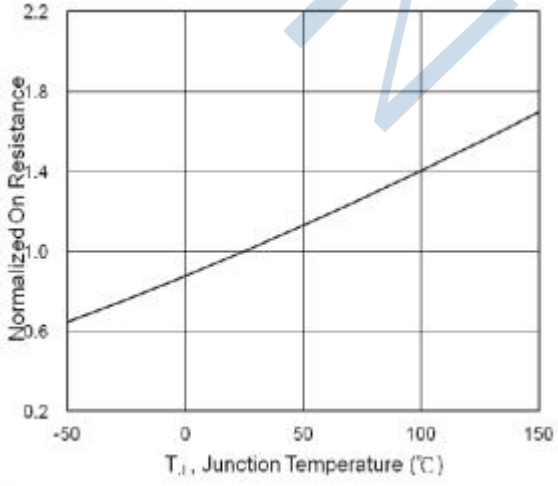


Fig.6 Normalized RDSon vs.TJ



Typical Performance Characteristics

Fig.7 Capacitance

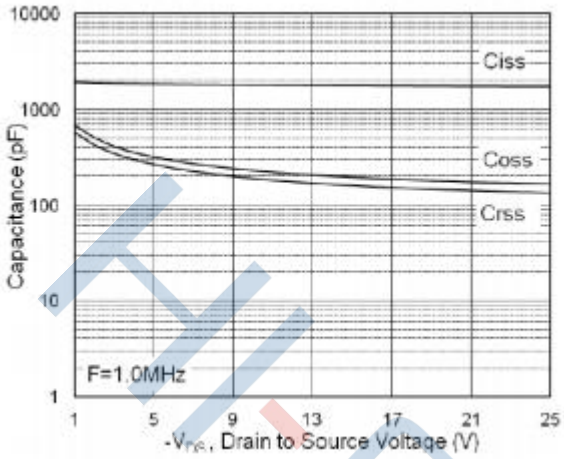
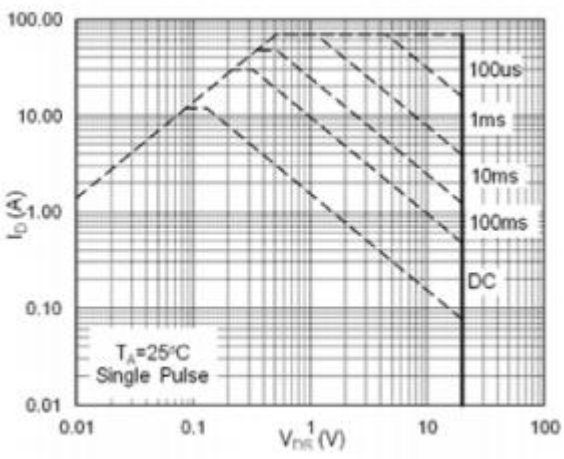
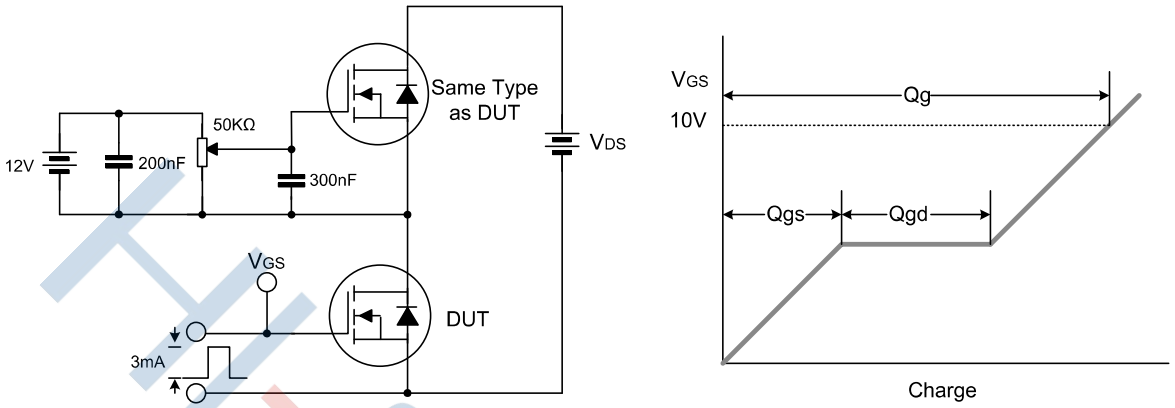


Fig.8 Safe Operating Area

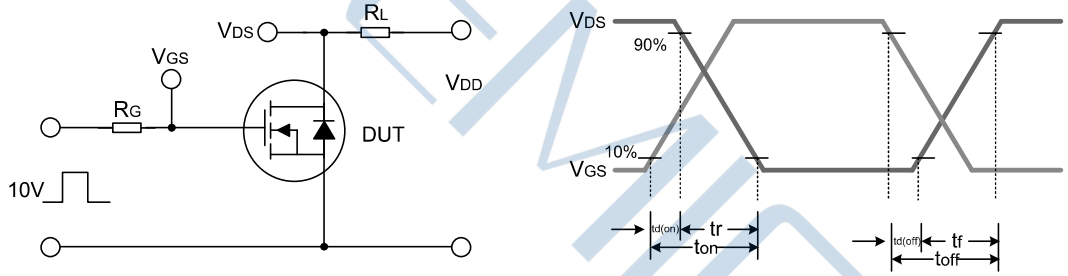


Test Circuit

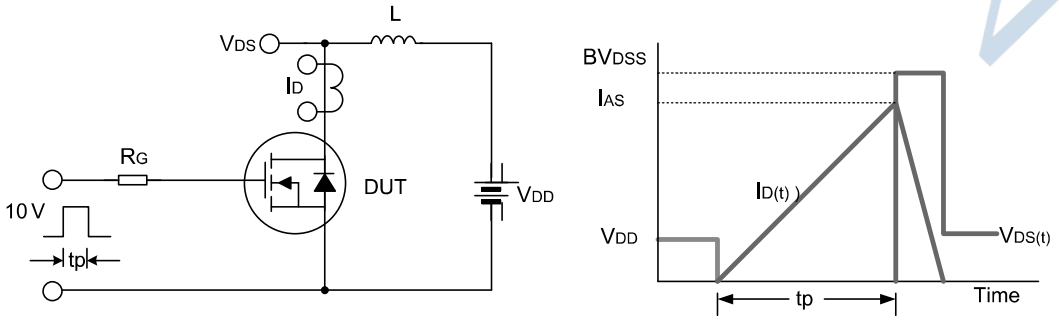
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform

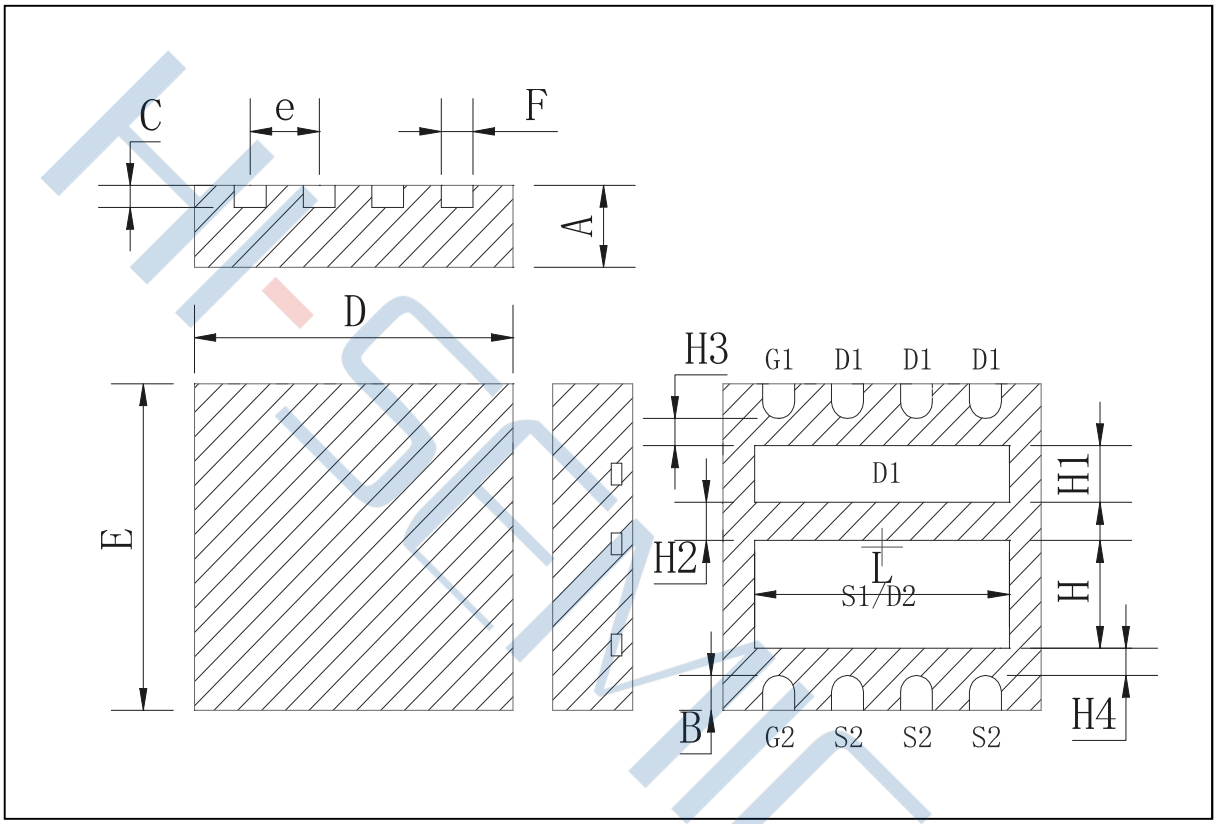


Unclamped Inductive Switching Test Circuit & Waveform



Package Dimensions of DFN3*3-8L

Unit:mm



Symbol	Min	Typ	Max
A	0.70	0.75	0.80
B	0.27	0.32	0.37
C	0.153	0.203	0.253
D	2.90	3.00	3.10
E	2.90	3.00	3.10
e	0.60	0.65	0.70
F	0.25	0.30	0.35
H	0.89	0.99	1.09
H1	0.42	0.52	0.62
H2	0.25	0.35	0.45
H3	0.15	0.25	0.35
H4	0.15	0.25	0.35
L	2.30	2.40	2.50

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