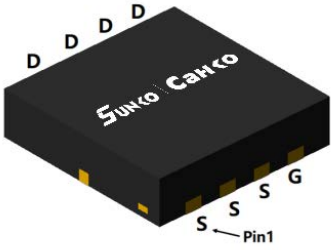
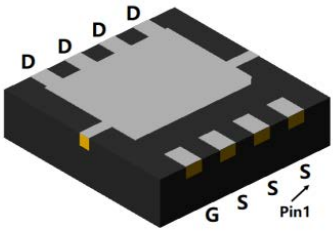
N-Channel Enhancement Mode Field Effect Transistor

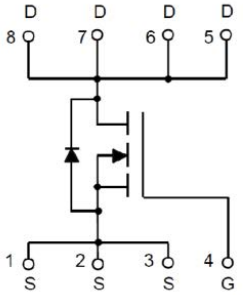


Top View



Bottom View

DFN3333-8L



Product Summary

- V_{DS} 30V
- I_D 50A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜6.0 mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜7.0 mohm
- 100% EAS Tested

General Description

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 3
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- High current load applications
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

■ Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	30	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_A=25℃	I_D	12	A
	T_A=100℃		7	
	T_C=25℃		50	
	T_C =100℃		31	
Pulsed Drain Current [A]		I_{DM}	190	A
Total Power Dissipation	T_A=25℃	P_D	2	W
	T_A=100℃		0.8	
	T_C=25℃		35	
	T_C =100℃		14	
Single Pulse Avalanche Energy [B]		E_{AS}	128	mJ
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	3.6	℃/ W
Thermal Resistance Junction-to- Ambient [C]		$R_{\theta JA}$	60	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SCQ50N03A	F1	Q50N03	5000	10000	100000	13“ reel

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=15A		4.9	6.0	mΩ
		V_{GS}= 4.5V, I_D=15A		5.9	7.0	
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V			1.2	V
Maximum Body-Diode Continuous Current	I_S				50	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V,f=1MHZ		2504		pF
Output Capacitance	C_{oss}			323		
Reverse Transfer Capacitance	C_{rss}			283		
Gate resistance	R_g	F= 1MHZ		1.5		Ω
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=15V,I_D=20A		54		nC
Gate-Source Charge	Q_{gs}			26		
Gate-Drain Charge	Q_{gd}			8.5		
Reverse Recovery Chrage	Q_{rr}	I_F=15A, di/dt=100A/us		10.2		
Reverse Recovery Time	t_{rr}			15		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=20V, I_D=2A R_{GEN}=3Ω		11		
Turn-on Rise Time	t_r			20		
Turn-off Delay Time	$t_{D(off)}$			41		
Turn-off fall Time	t_f			25		

A. Repetitive rating; pulse width limited by max. junction temperature.
B. T_j=25℃, V_{DD}=24V, V_G=10V, L=1mH, IAS=16A
C. The value of RθJA is measured with the device mounted on 1 in2 FR-4 board with 2oz. Copper, in the still air environment with TA =25℃. The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

■ Typical Performance Characteristics

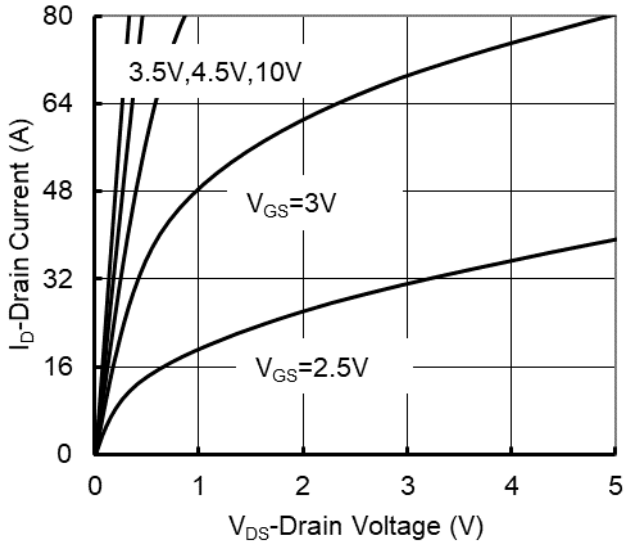


Figure1. Output Characteristics

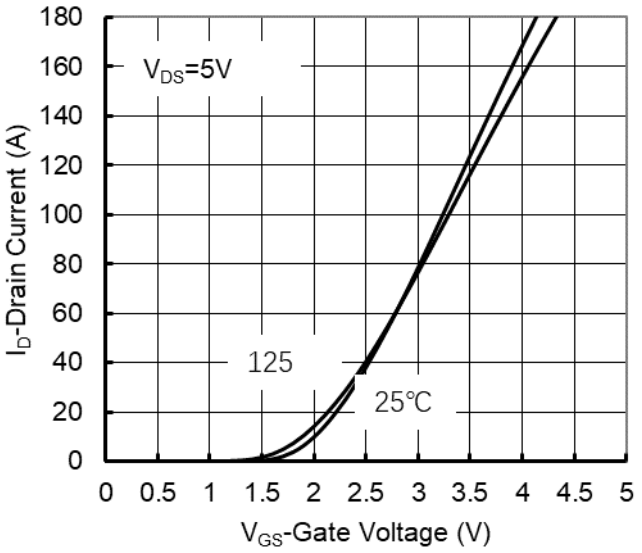


Figure2. Transfer Characteristics

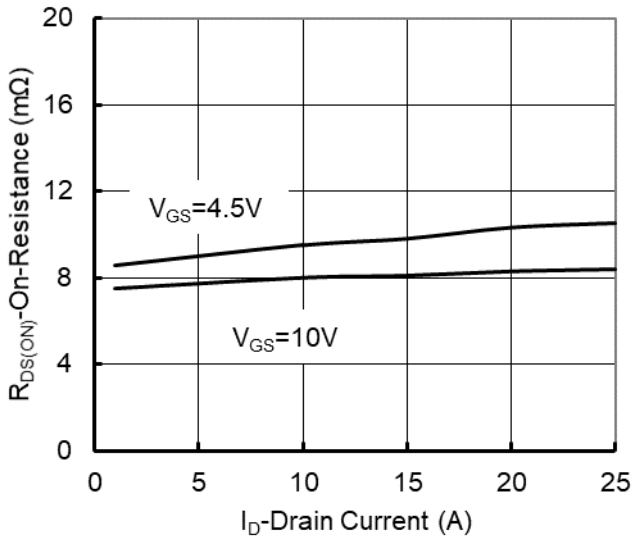


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

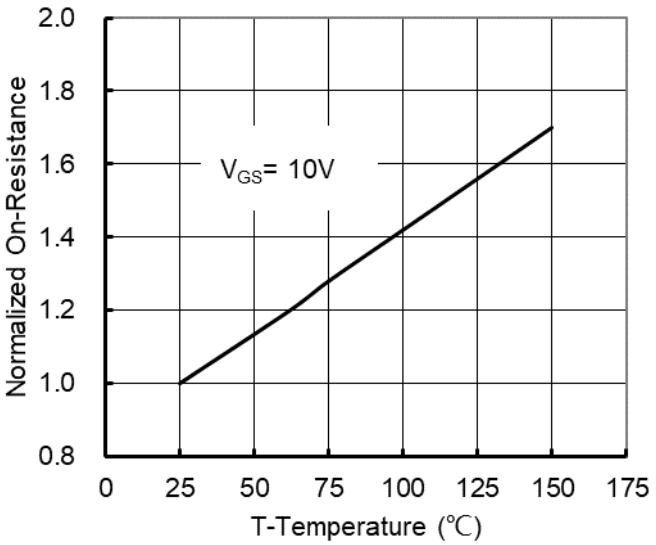


Figure 4: On-Resistance vs. Junction Temperature

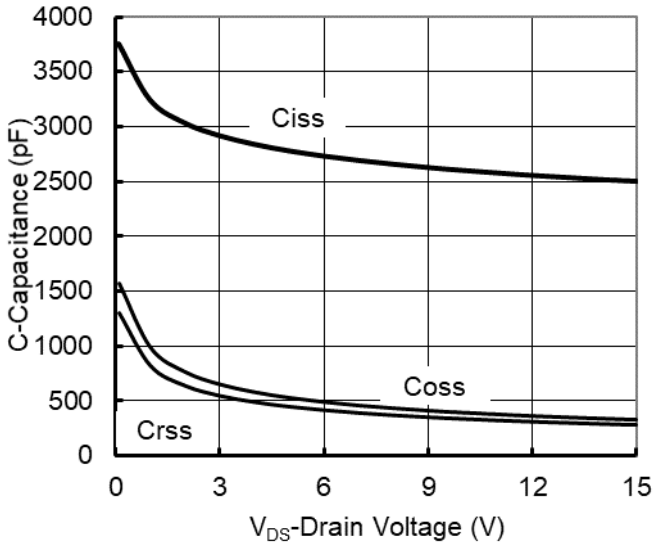


Figure5. Capacitance Characteristics

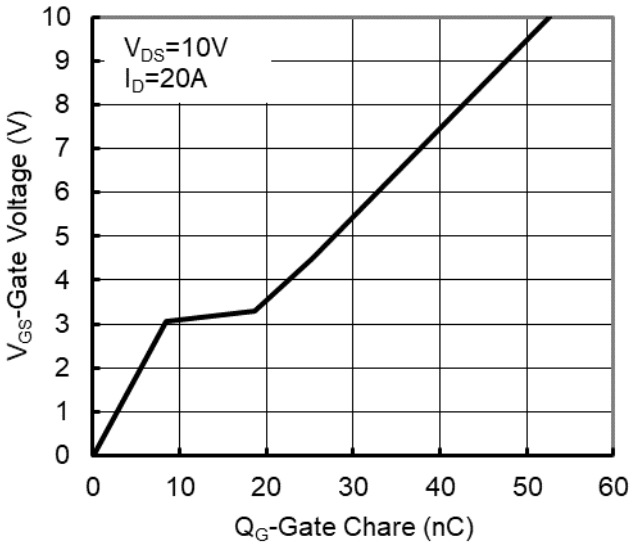


Figure6. Gate Charge

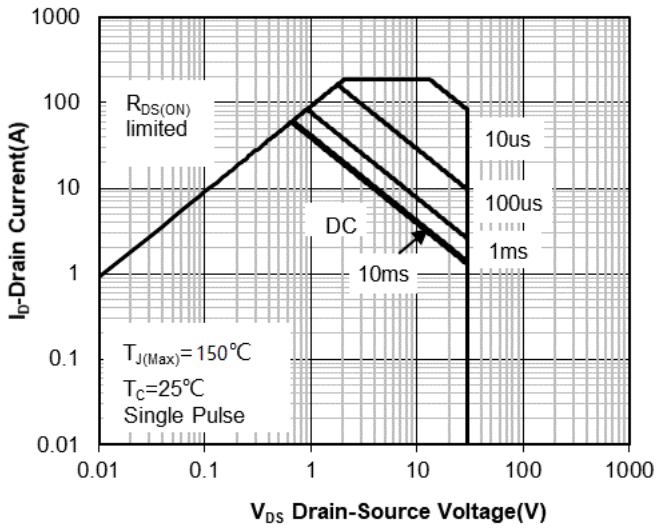


Figure7. Safe Operation Area

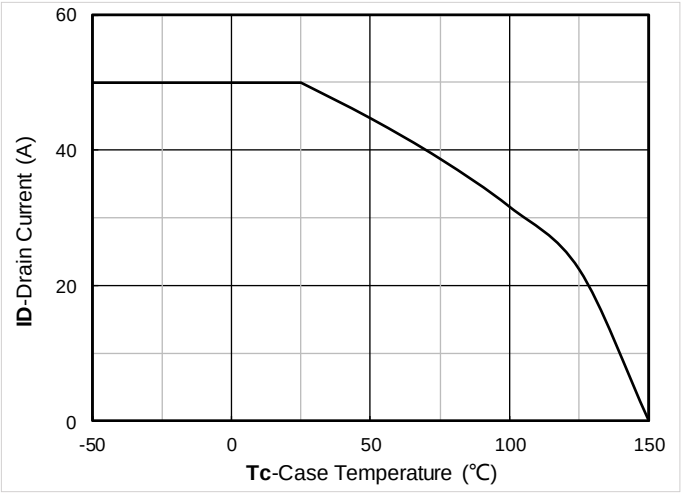


Figure8. Maximum Continuous Drain Current vs Case Temperature

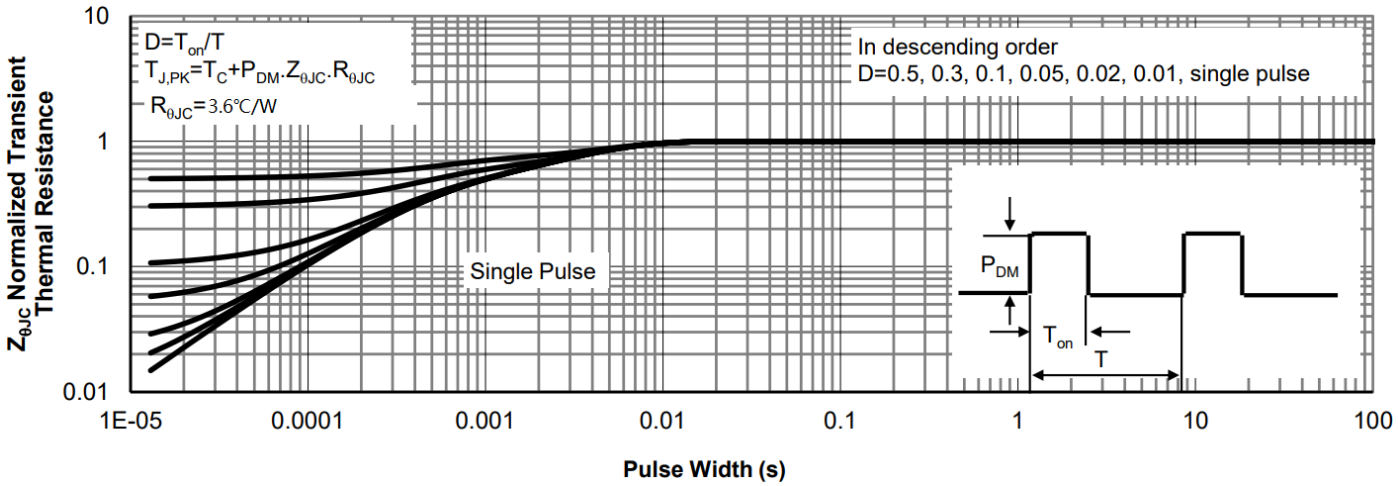
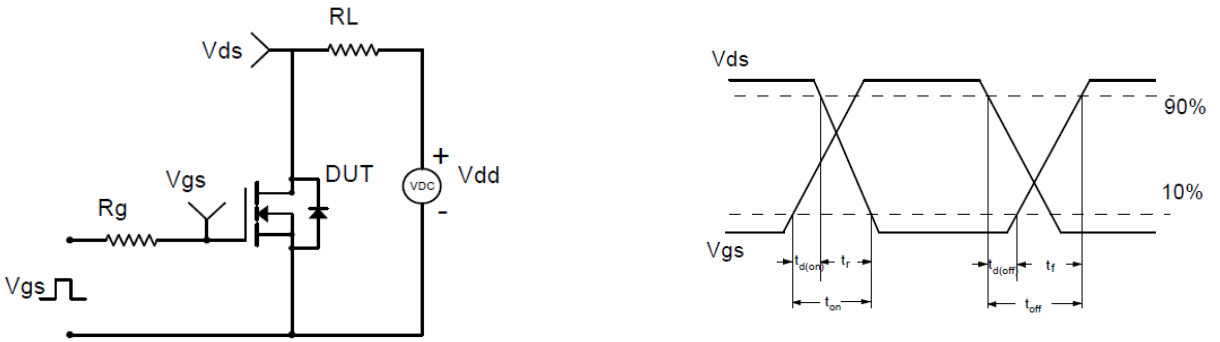
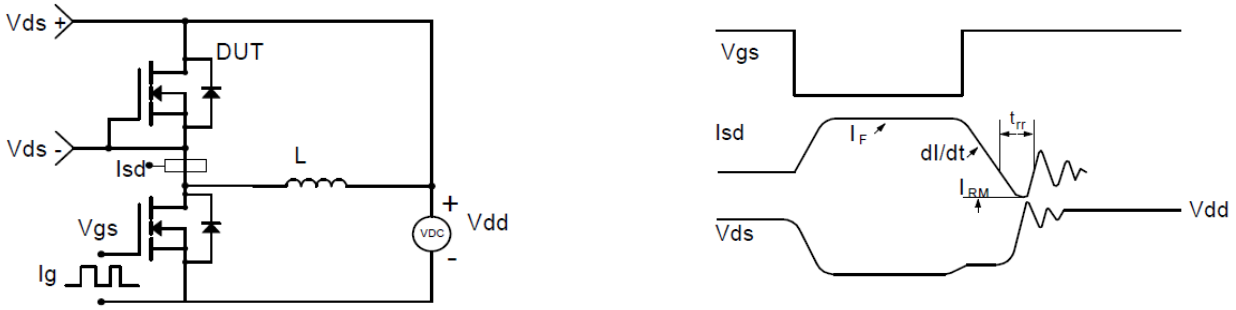


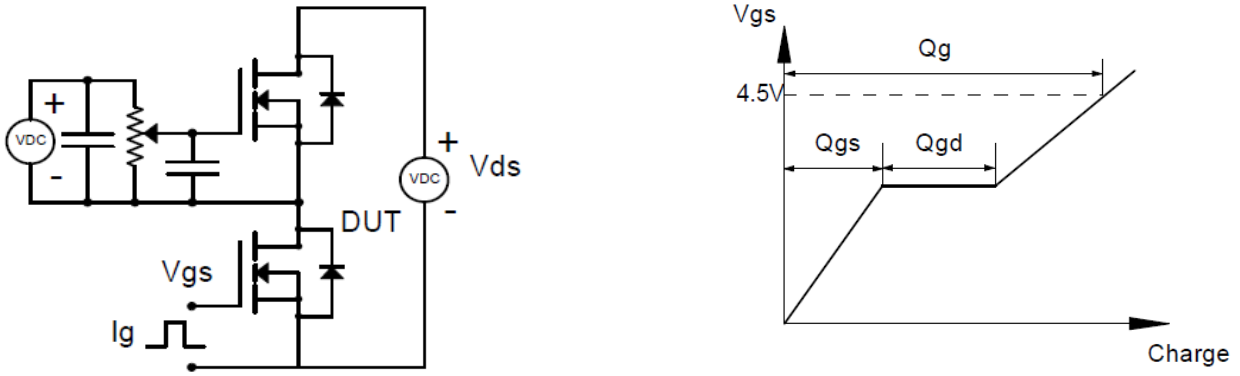
Figure9.Normalized Maximum Transient Thermal Impedance



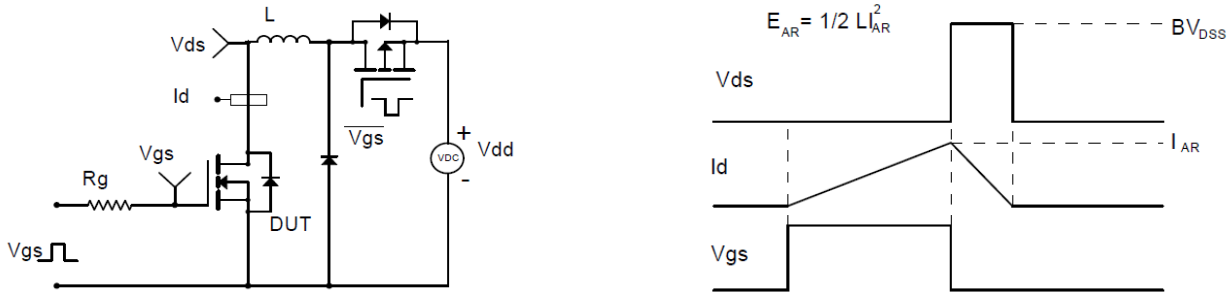
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

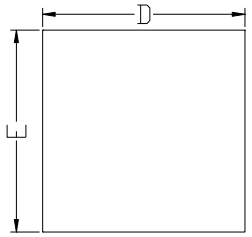


Gate Charge Test Circuit & Waveform

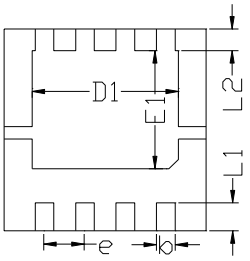


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

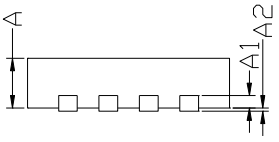
■DFN3333-8L Package information



Top View
正面视图



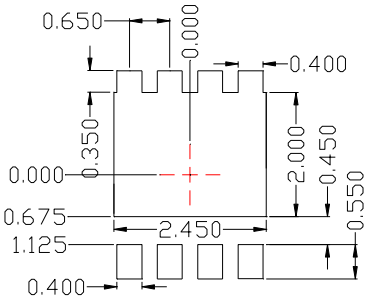
Bottom View
背面视图



Side View
侧面视图

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	3.15	3.25	3.35
E	3.15	3.25	3.35
A	0.70	0.80	0.90
A1		0.20 BSC	
A2			0.10
D1	2.20	2.35	2.50
E1	1.80	1.90	2.00
L1	0.35	0.45	0.55
L2		0.35 BSC	
b	0.20	0.30	0.40
e		0.65 BSC	

Note:
1.Controlling dimension:in millimeters.
2.General tolerance:+/-0.10mm.
3.The pad layout is for reference purposes only.



Suggested Solder Pad Layout
Top View

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