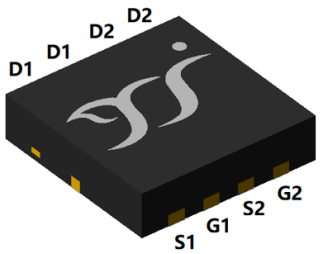
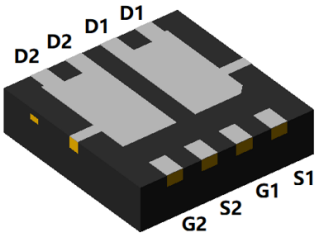
N-Channel and P-Channel Complementary Power MOSFET

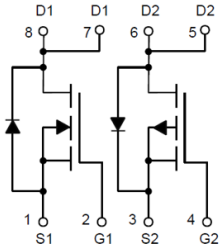


Top View



Bottom View

DFN3333-8L



Product Summary

NMOS

- V_{DS} 30V
- I_D 28A
- $R_{DS(ON)}$(at VGS=10V) ＜18mohm
- $R_{DS(ON)}$(at VGS=4.5V) ＜30mohm

PMOS

- V_{DS} -30V
- I_D -17A
- $R_{DS(ON)}$(at VGS=-10V) ＜45mohm
- $R_{DS(ON)}$(at VGS=-4.5V) ＜65mohm

General Description

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

Applications

- Wireless charger
- Load switch
- Power management

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

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-source Voltage		V_{DS}	30	-30	V
Gate-source Voltage		V_{GS}	±20	±20	V
Drain Current	T_A=25℃	I_D	7.5	-5	A
	T_A=70℃		6	-4	
	T_C=25℃		28	-17	
	T_C =70℃		21	-13	
Pulsed Drain Current [A]		I_{DM}	68	-44	A
Total Power Dissipation[B]	T_A=25℃	P_D	2	2	W
	T_A=70℃		1	1	
	T_C=25℃		27	22	
	T_C =70℃		17	14	
Thermal Resistance Junction-to-Ambient [C]		$R_{\theta JA}$	62.5	62.5	℃/ W
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	4.5	5.5	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJQ4606A	F1	Q4606	5000	10000	100000	13“ reel

■ N-MOS 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	2.2	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=14A		15	18	mΩ
		V_{GS}=4.5V, I_D=5A		23	30	
Diode Forward Voltage	V_{SD}	I_S=14A,V_{GS}=0V			1.2	V
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V,f=1MHZ		526		pF
Output Capacitance	C_{oss}			78		
Reverse Transfer Capacitance	C_{rss}			69		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=15V,I_D=5.6A		12.22		nC
Gate-Source Charge	Q_{gs}			2.37		
Gate-Drain Charge	Q_{gd}			2.31		
Reverse Recovery Chrage	Q_{rr}	I_F=5.6A, di/dt=100A/us		1.28		
Reverse Recovery Time	t_{rr}			16.5		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V, I_D=5.6A R_{GEN}=3Ω		5		
Turn-on Rise Time	t_r			28.2		
Turn-off Delay Time	$t_{D(off)}$			12.8		
Turn-off fall Time	t_f			21.6		

■ P-MOS 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	-2.4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-8A		36	45	mΩ
		V_{GS}=-4.5V, I_D=-3.5A		49	65	
Diode Forward Voltage	V_{SD}	I_S=-8A,V_{GS}=0V			-1.2	V
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=-15V,V_{GS}=0V,f=1MHZ		719		pF
Output Capacitance	C_{oss}			78		
Reverse Transfer Capacitance	C_{rss}			64		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=-10V,V_{DS}=-15V,I_D=-5.1A		14.23		nC
Gate-Source Charge	Q_{gs}			3.16		
Gate-Drain Charge	Q_{gd}			2		
Reverse Recovery Chrage	Q_{rr}	I_F=-5.1A, di/dt=100A/us		5.3		
Reverse Recovery Time	t_{rr}			30		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-10V, V_{DS}=-15V, I_D=5.1A R_{GEN}=3Ω		7.4		
Turn-on Rise Time	t_r			37		
Turn-off Delay Time	$t_{D(off)}$			31.6		
Turn-off fall Time	t_f			42		

A. Repetitive rating; pulse width limited by max. junction temperature.
B. Pd is based on max. junction temperature, using junction-case thermal resistance.
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.

■ N-MOS Typical Performance Characteristics

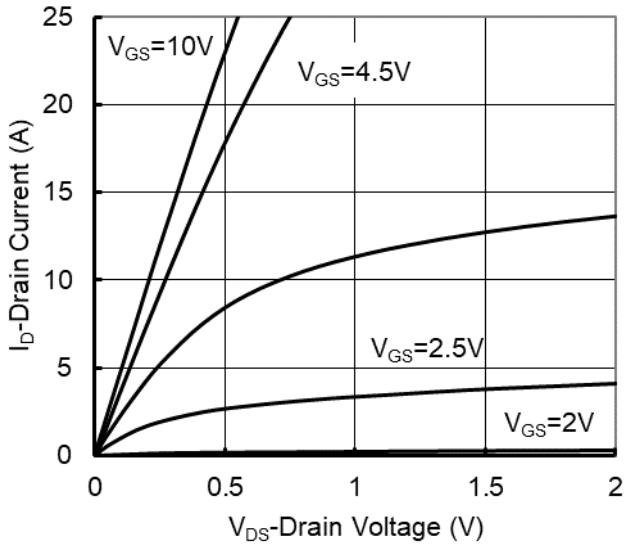


Figure1. Output Characteristics

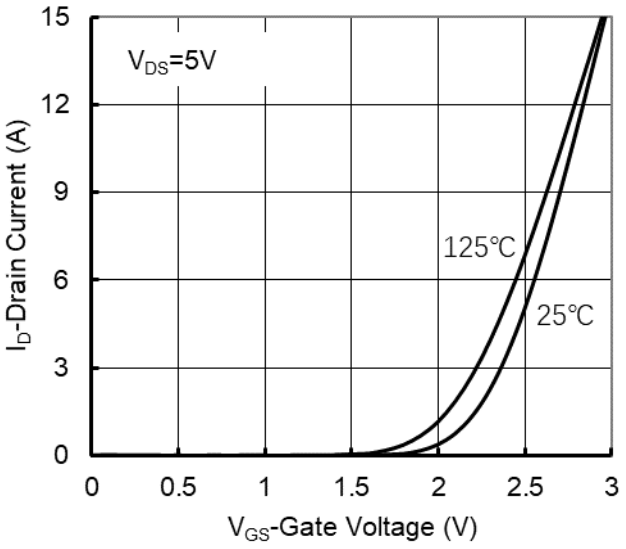


Figure2. Transfer Characteristics

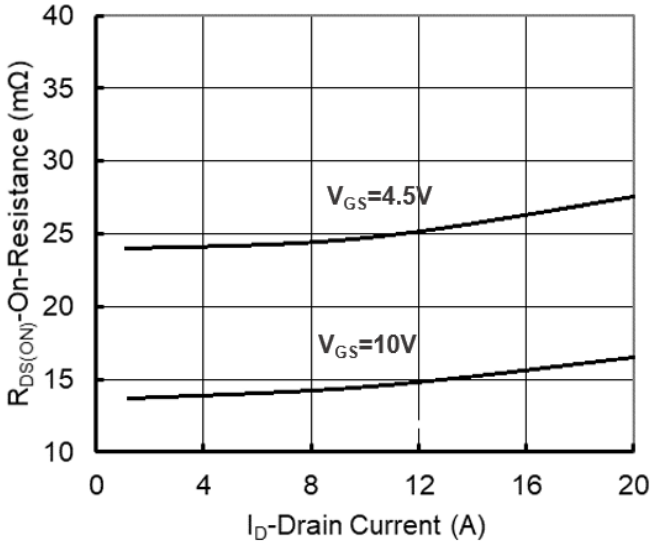


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

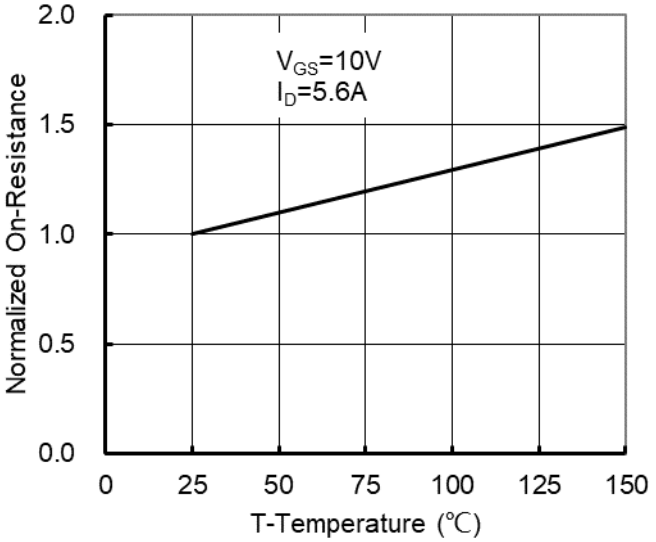


Figure 4: On-Resistance vs. Junction Temperature

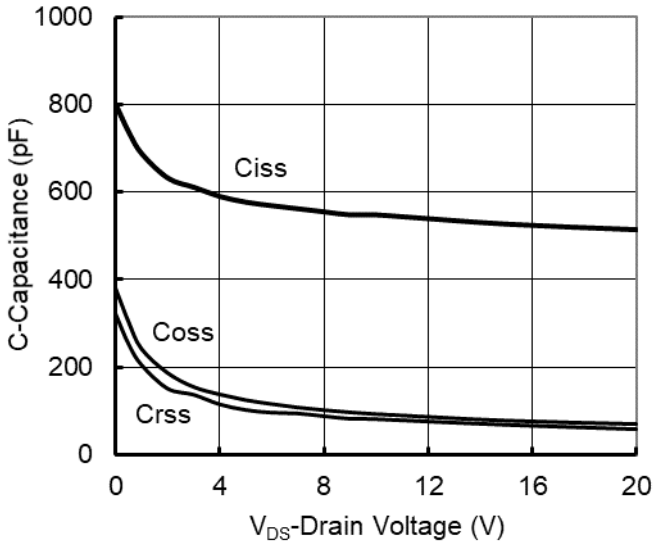


Figure5. Capacitance Characteristics

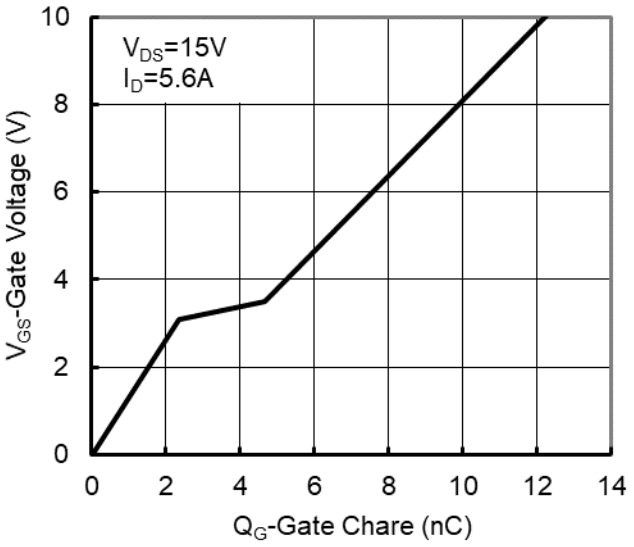


Figure6. Gate Charge

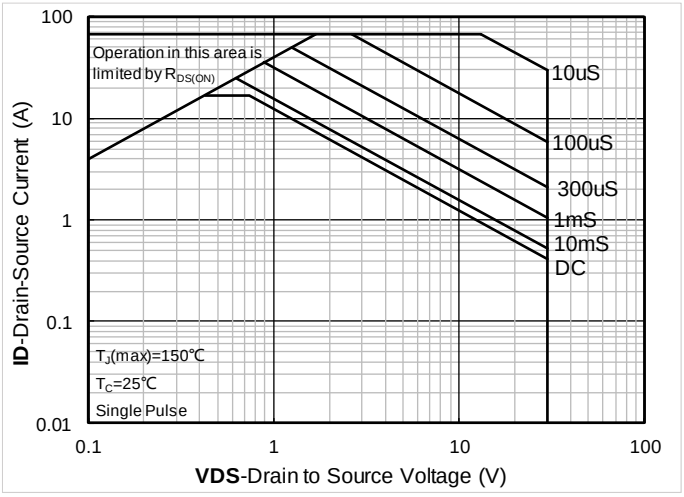


Figure7. Safe Operation Area

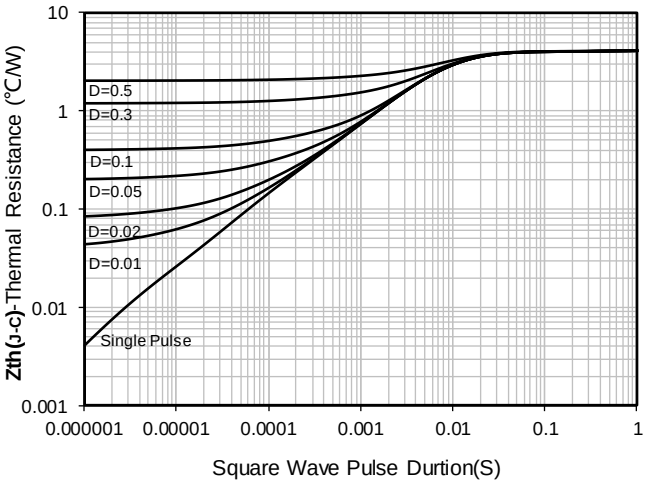


Figure8.Normalized Maximum Transient Thermal Impedance

■ P-MOS Typical Performance Characteristics

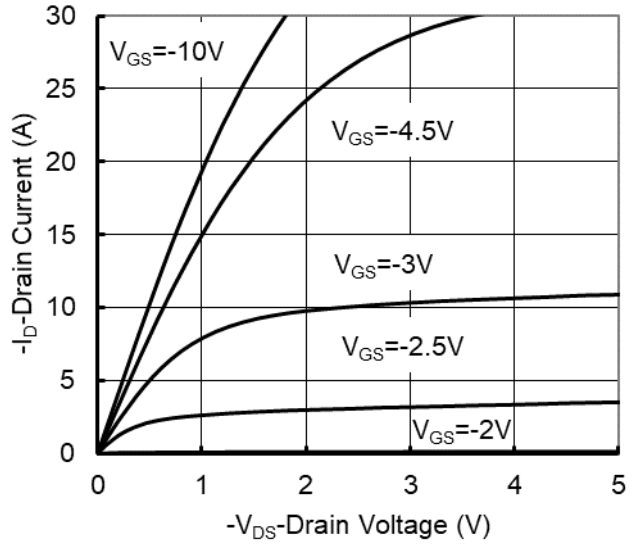


Figure1. Output Characteristics

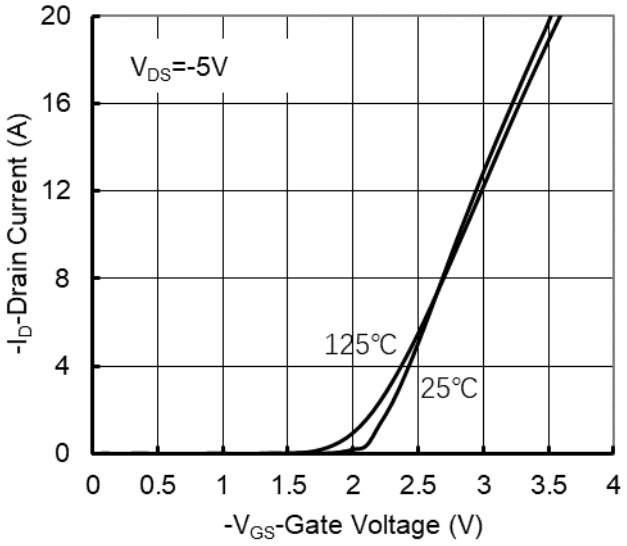


Figure2. Transfer Characteristics

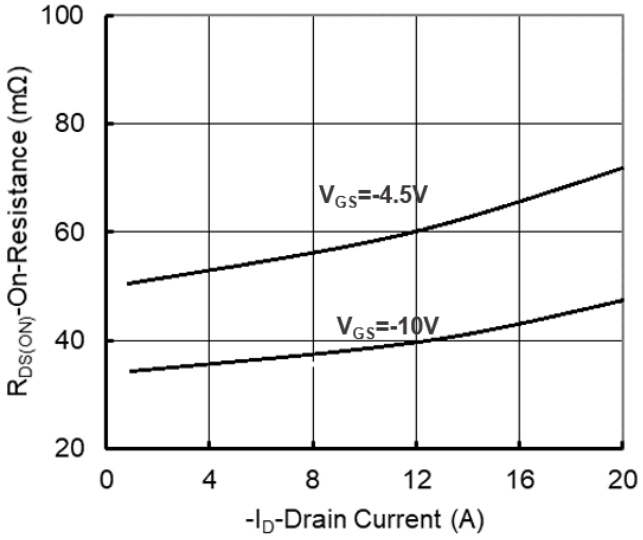


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

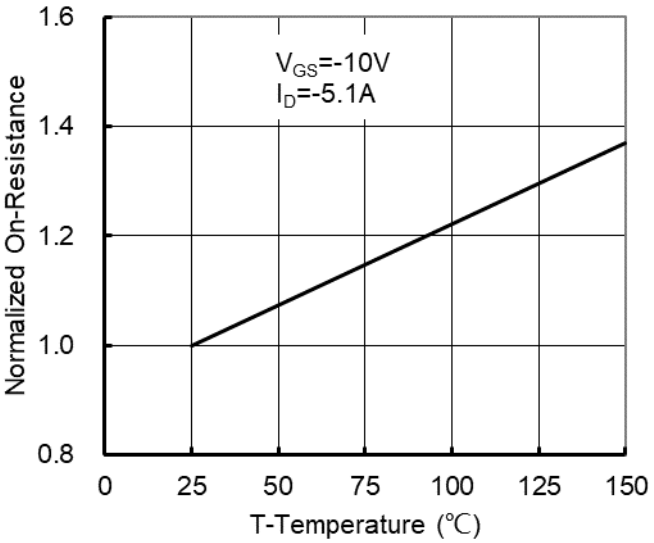


Figure 4: On-Resistance vs. Junction Temperature

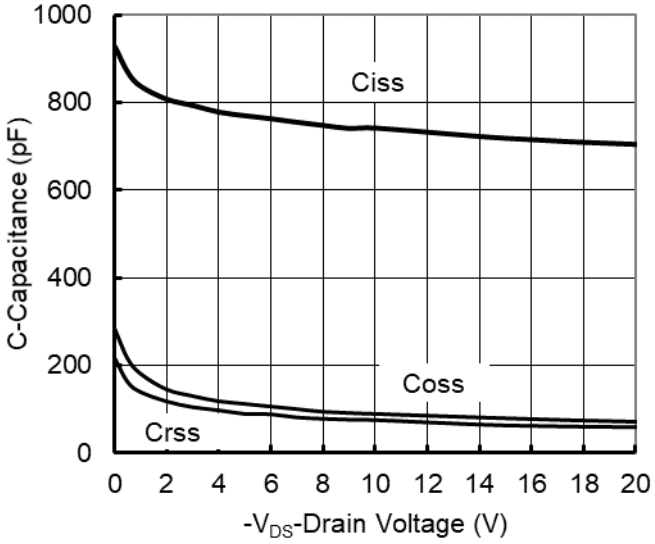


Figure5. Capacitance Characteristics

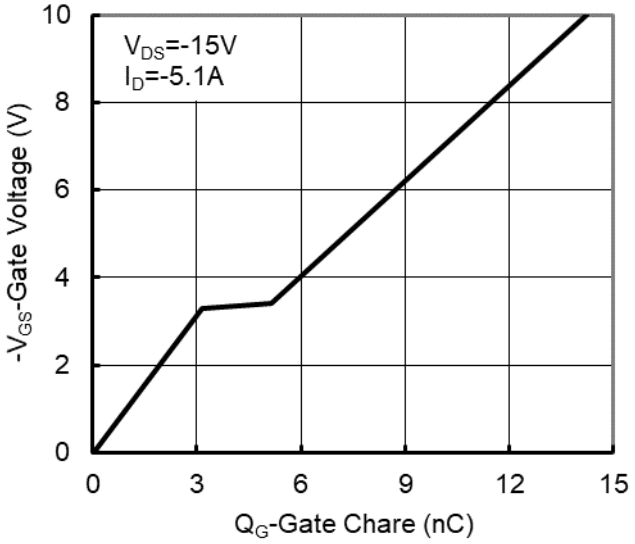


Figure6. Gate Charge

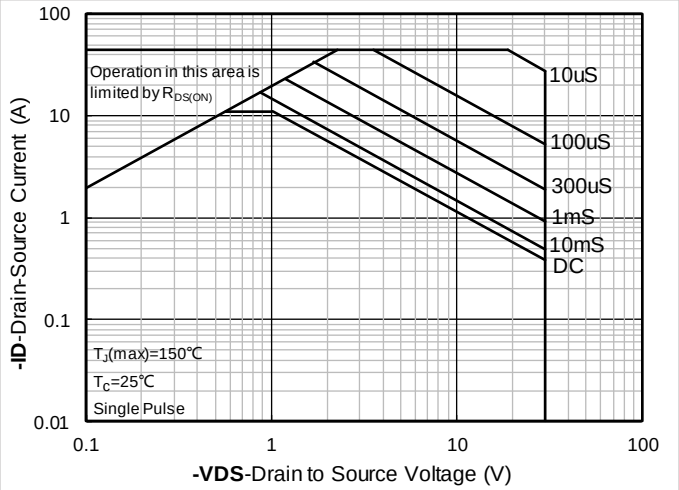


Figure7. Safe Operation Area

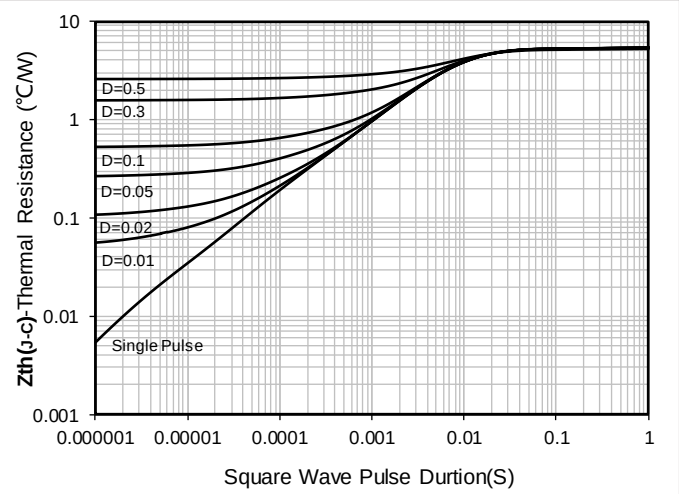
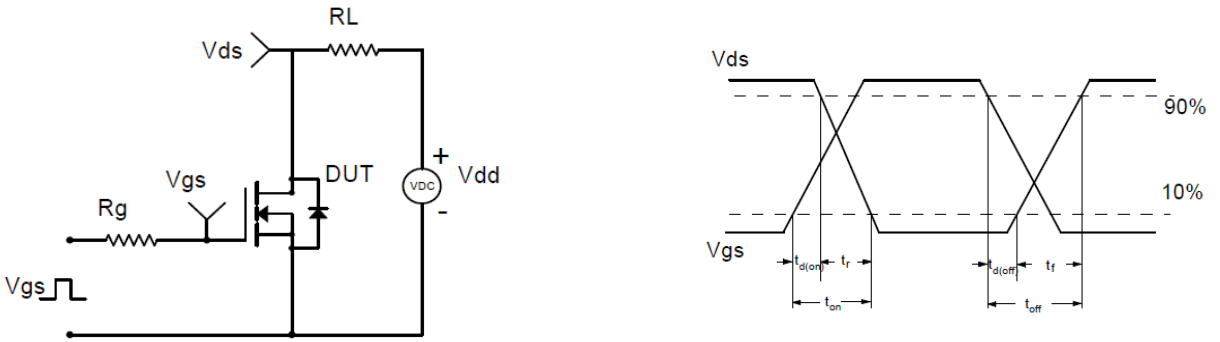
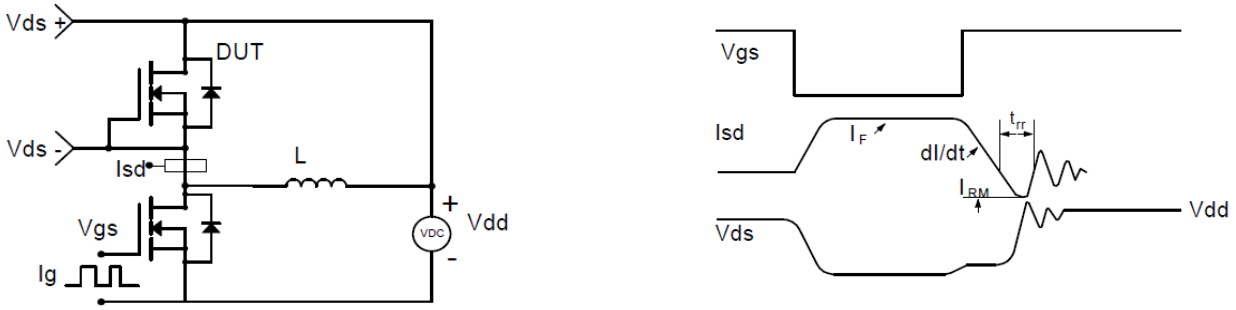


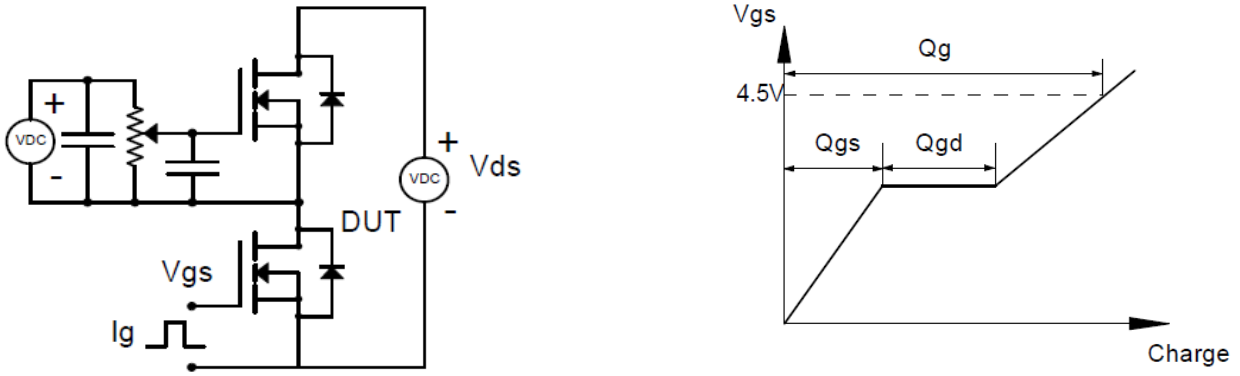
Figure9.Normalized Maximum Transient Thermal Impedance



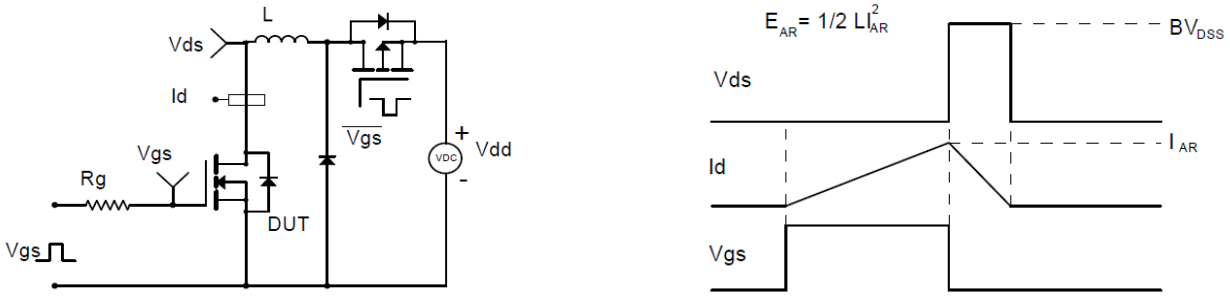
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

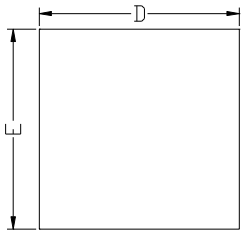


Gate Charge Test Circuit & Waveform

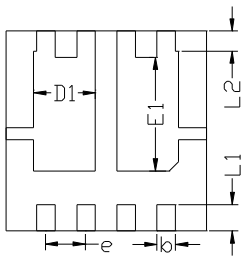


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

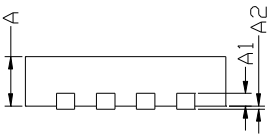
■ DFN3333-8L Package Information



Top View
正面视图



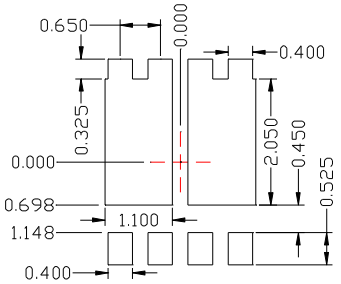
Bottom View
背面视图



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	0.90	1.00	1.10
E1	1.75	1.85	1.95
L1	0.325	0.425	0.525
L2		0.325 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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