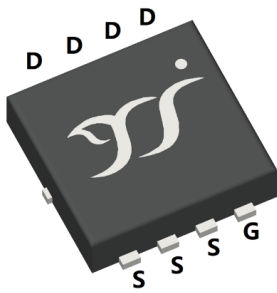
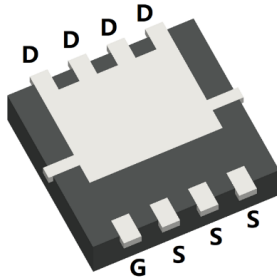


N-Channel Enhancement Mode Field Effect Transistor

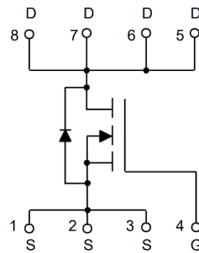


Top View



Bottom View

PDFN3333-8L



Product Summary

- V_{DS} 40V
- I_D 75A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $<4.8m\Omega$
- 100% EAS Tested
- 100% ∇V_{DS} Tested

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Motor Drive
- DC-DC converters
- Battery Protection

■ Absolute Maximum Ratings ($T_J=25^\circ C$ unless otherwise noted)

Parameter		Symbol	Limit	Unit		
Drain-source Voltage		V_{DS}	40	V		
Gate-source Voltage		V_{GS}	± 20	V		
Continuous Drain Current (Note 1,2)	Steady-State	$T_A=25^\circ C, V_{GS}=10V$	16.9	A		
		$T_A=100^\circ C, V_{GS}=10V$	11.9			
Continuous Drain Current (Note 1,3)	Steady-State	$T_C=25^\circ C, V_{GS}=10V$	75			
		$T_C=100^\circ C, V_{GS}=10V$	53			
Pulsed Drain Current	$T_C=25^\circ C, t_p=100\mu s$		I_{DM}	250	A	
Avalanche energy		$V_G=10V, R_G=25\Omega, L=0.5mH, I_{AS}=14.7A$		EAS	54	mJ
Total Power Dissipation (Note 1,2)	Steady-State	$T_A=25^\circ C$	P_D	2.3	W	
		$T_A=100^\circ C$		1.1		
Total Power Dissipation (Note 1,3)	Steady-State	$T_C=25^\circ C$		60		
		$T_C=100^\circ C$		30		
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+175	$^\circ C$		

■ Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	54	65	$^\circ C/W$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	2	2.5	

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJQ4D8G04H	F1	Q4D8G04	5000	10000	100000	13" reel



YJQ4D8G04H

■ Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
		$V_{GS}=0V, I_D=1mA$	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V$	-	-	1	μA
		$V_{DS}=40V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	100	
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	2.8	4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	3.8	4.8	m Ω
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V$	-	-	1.2	V
Gate resistance	R_G	$f=1MHz$	-	1.6	-	Ω
Maximum Body-Diode Continuous Current	I_S		-	-	75	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V, f=1MHz$	-	880	-	pF
Output Capacitance	C_{oss}		-	495	-	
Reverse Transfer Capacitance	C_{rss}		-	42	-	
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=20V, I_D=20A$	-	15.7	-	nC
Gate-Source Charge	Q_{gs}		-	4.6	-	
Gate-Drain Charge	Q_{gd}		-	4.9	-	
Reverse Recovery Charge	Q_{rr}	$I_F=20A, di/dt=100A/us$	-	11.3	-	nC
Reverse Recovery Time	t_{rr}		-	20.6	-	ns
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=20V, I_D=20A$ $R_{GEN}=3\Omega$	-	11.6	-	ns
Turn-on Rise Time	t_r		-	58	-	
Turn-off Delay Time	$t_{D(off)}$		-	16.2	-	
Turn-off fall Time	t_f		-	6	-	

Note:

- The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in² pad of 2oz. Copper, in the still air environment with $T_A=25^\circ\text{C}$. The maximum allowed junction temperature of 175°C . The value in any given application depends on the user's specific board design.
- Thermal resistance from junction to soldering point (on the exposed drain pad).



YJQ4D8G04H

Typical Electrical and Thermal Characteristics Diagrams

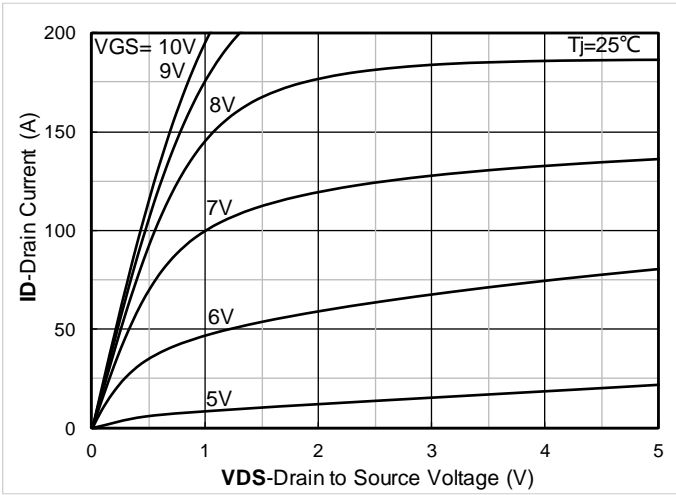


Figure 1. Output Characteristics

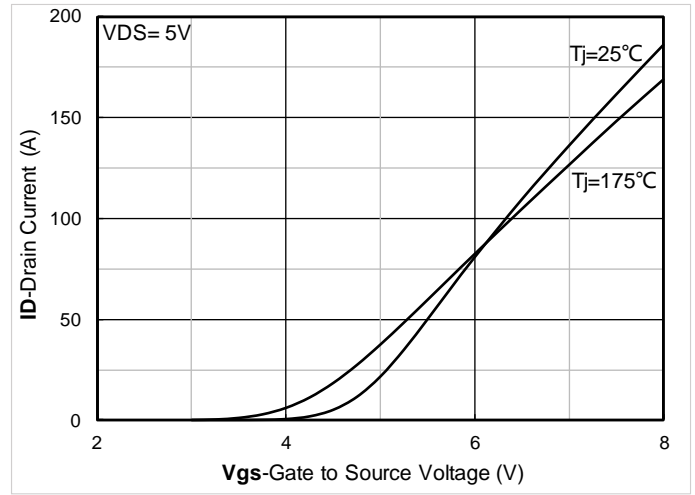


Figure 2. Transfer Characteristics

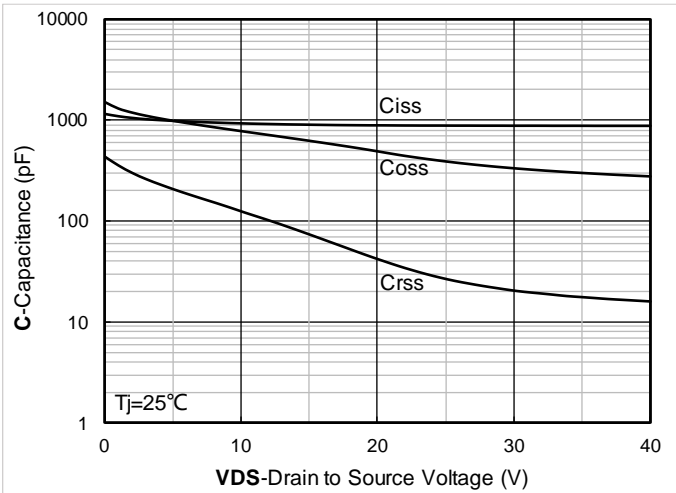


Figure 3. Capacitance Characteristics

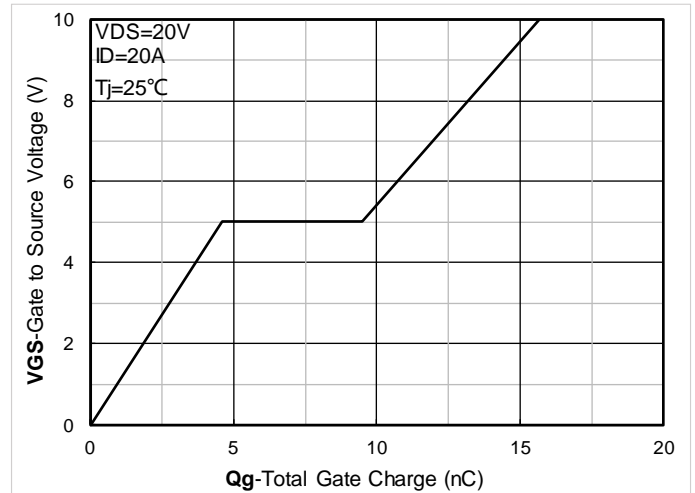


Figure 4. Gate Charge

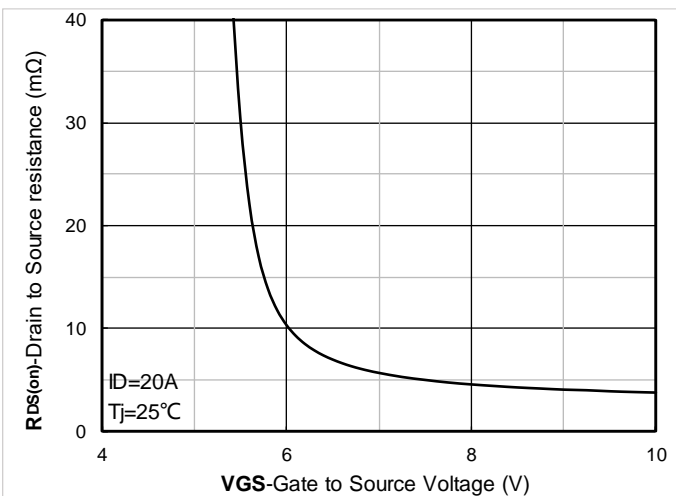


Figure 5. On-Resistance vs Gate to Source Voltage

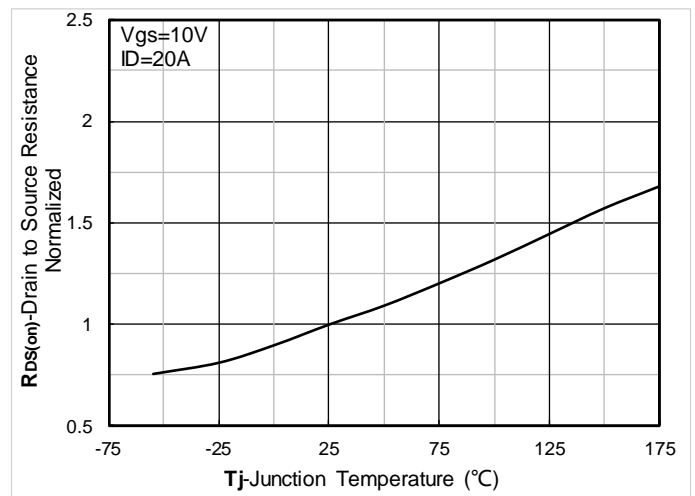


Figure 6. Normalized On-Resistance



YJQ4D8G04H

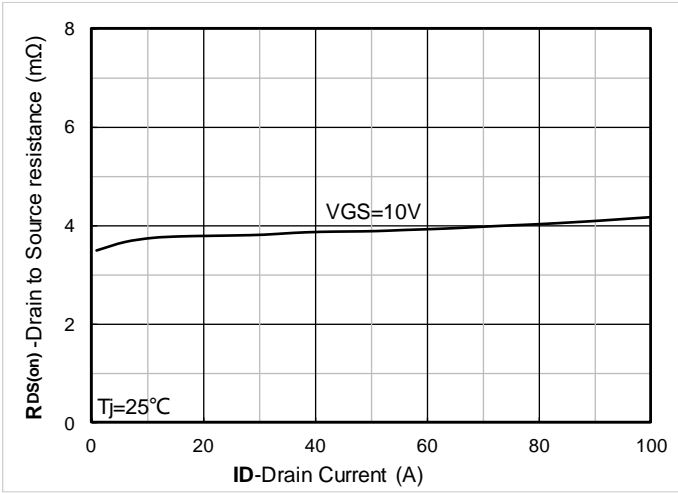


Figure 7. RDS(on) VS Drain Current

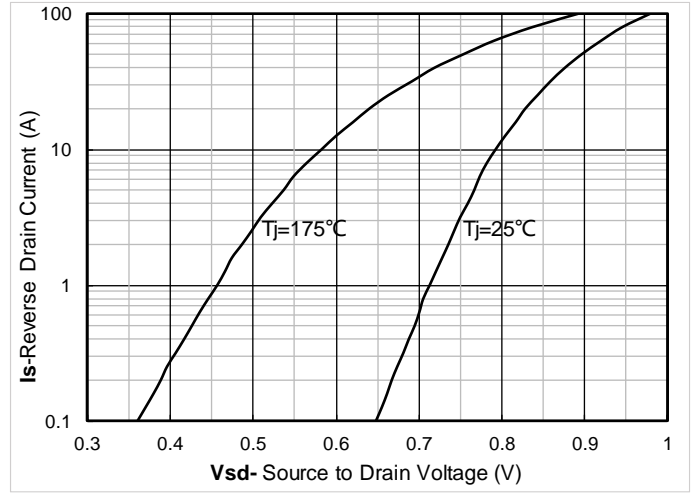


Figure 8. Forward characteristics of reverse diode

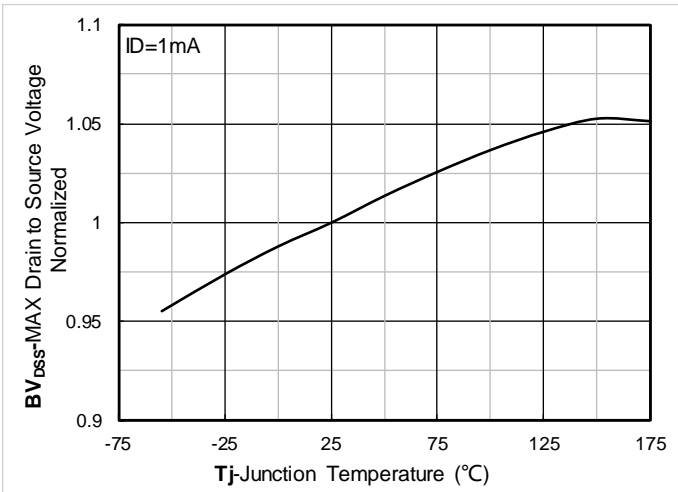


Figure 9. Normalized breakdown voltage

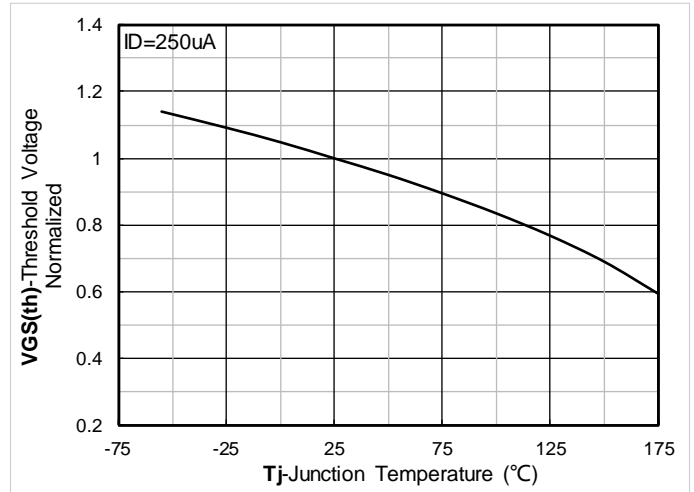


Figure 10. Normalized Threshold voltage

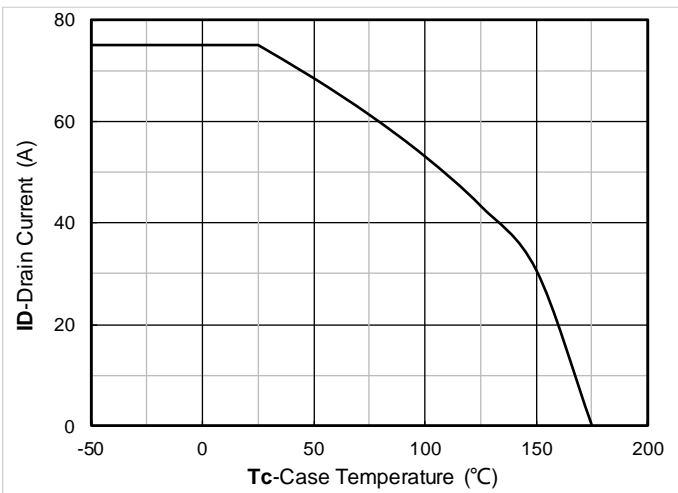


Figure 11. Current dissipation

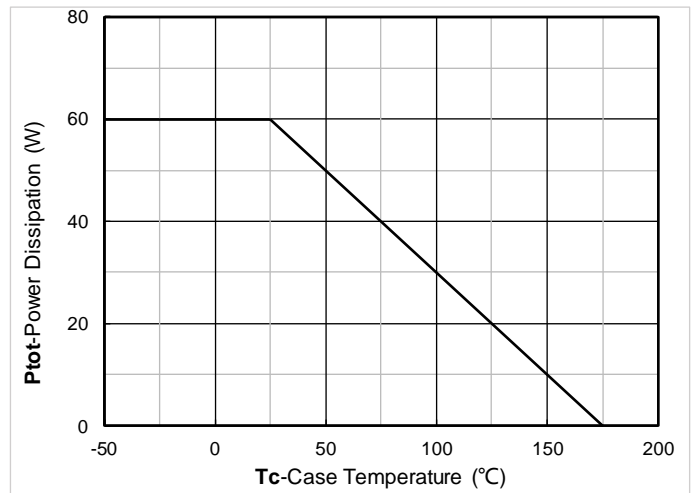


Figure 12. Power dissipation

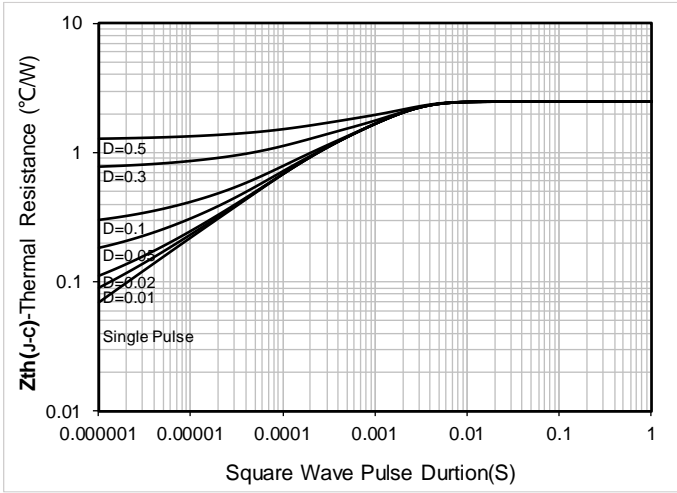


Figure 13. Maximum Transient Thermal Impedance

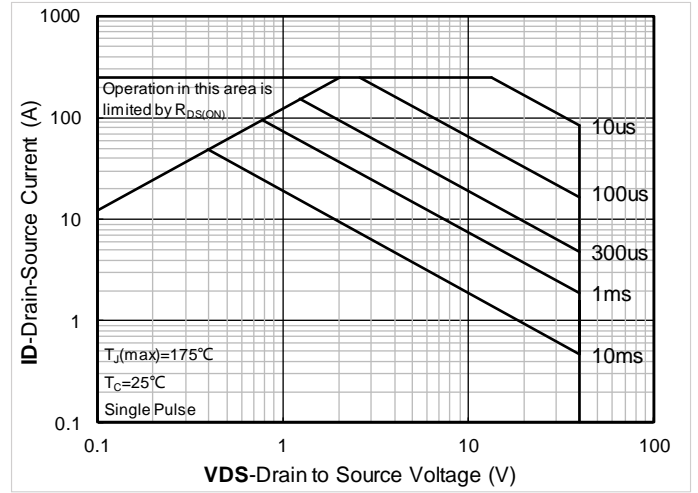


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

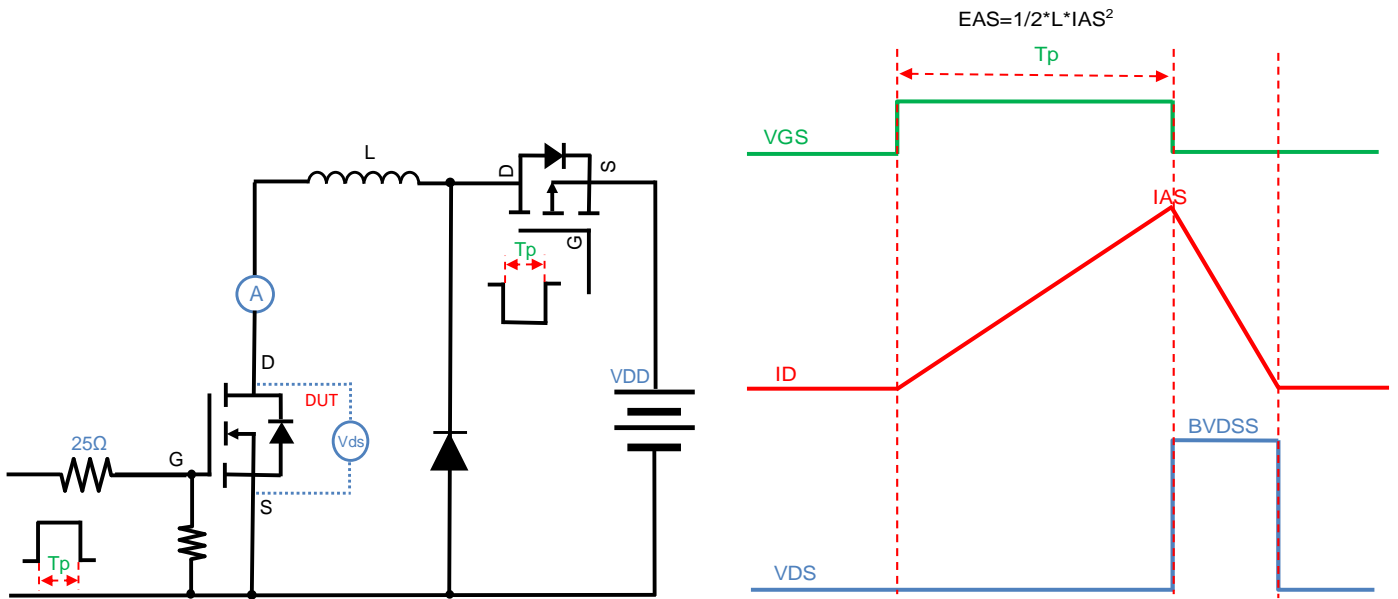


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform



Figure B. Gate Charge Test Circuit & Waveform



Figure C. Resistive Switching Test Circuit & Waveform

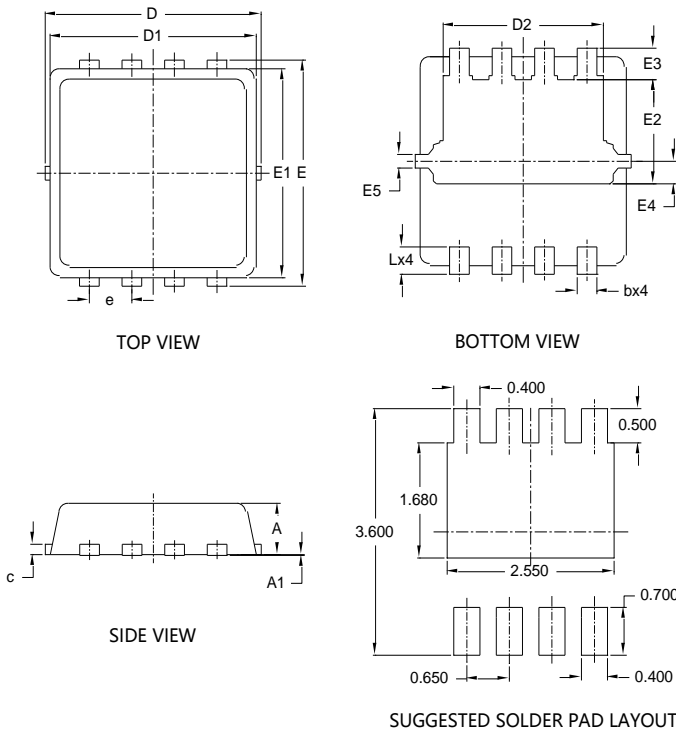


Figure D. Diode Recovery Test Circuit & Waveform



YJQ4D8G04H

■ PDFN3333-8L-B-0.75MM Package information



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.028	0.033	0.700	0.850
A1	0.000	0.002	0.000	0.050
b	0.008	0.016	0.200	0.400
c	0.004	0.010	0.100	0.250
D	0.124	0.136	3.150	3.450
D1	0.118	0.130	3.000	3.300
D2	0.089	0.104	2.250	2.650
E	0.124	0.136	3.150	3.450
E1	0.114	0.126	2.900	3.200
E2	0.052	0.068	1.320	1.720
E3	0.011	0.026	0.280	0.650
E4	0.013 REF		0.330 REF	
E5	0.008 REF		0.200 REF	
e	0.026 BSC		0.650 BSC	
L	0.012	0.020	0.300	0.500

NOTE:
 1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
 2. TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
 3. THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

UNIT: mm



YJQ4D8G04H

Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website <http://www.21yangjie.com> , or consult your nearest Yangjie's sales office for further assistance.