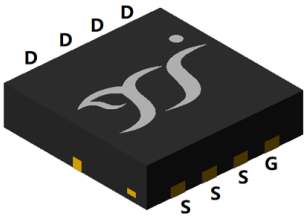
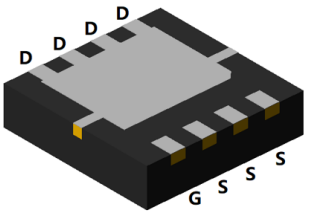
P-Channel Enhancement Mode Field Effect Transistor



Top View



Bottom View

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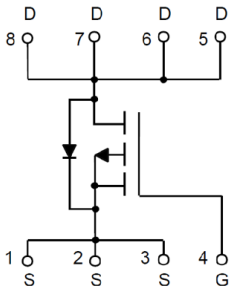


Product Summary

- V_{DS} -20V
- I_D -55A
- $R_{DS(ON)}$(at V_{GS}= -4.5V) ＜8.3mohm
- $R_{DS(ON)}$(at V_{GS}= -2.5V) ＜10.0mohm
- $R_{DS(ON)}$(at V_{GS}= -1.8V) ＜15.0mohm
- 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}	-20	V
Gate-source Voltage		V_{GS}	±10	V
Drain Current	Tc=25℃	I_D	-55	A
	Tc=100℃		-35	
Pulsed Drain Current [A]		I_{DM}	-160	A
Single Pulse Avalanche Energy [B]		E_{AS}	75	mJ
Total Power Dissipation	Tc=25℃	P_D	38	W
	Tc=100℃		15	
Thermal Resistance Junction-to-Case [C]		$R_{\theta JC}$	3.3	℃/ W
		$R_{\theta JA}$	39	
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
YJQ55P02A	F1	Q55P02A	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	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V			-1	μA
		VDS=-20V,VGS=0V,Tj=150℃			-100	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±10V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=-250μA	-0.4	-0.62	-1.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= -4.5V, I_D=-15A		6.5	8.3	mΩ
		V_{GS}= -2.5V, I_D=-10A		8.0	10.0	
		V_{GS}= -1.8V, I_D=-8.0A		10.3	15.0	
Diode Forward Voltage	V_{SD}	I_S=-20A,V_{GS}=0V		-0.7	-1.2	V
Maximum Body-Diode Continuous Current	I_S				-55	A
Gate resistance	Rg	F=1 MHz, Open drain		7.1		Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V,f=1MHZ		6358		pF
Output Capacitance	C_{oss}			690		
Reverse Transfer Capacitance	C_{rss}			477		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=-10V,V_{DS}=-15V,I_D=-9.1A		149		nC
Gate-Source Charge	Q_{gs}			12.7		
Gate-Drain Charge	Q_{gd}			21		
Reverse Recovery Charge	Q_{rr}	I_F=-6A, di/dt=100A/us		25.2		
Reverse Recovery Time	t_{rr}			46		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-10V, V_{DD}=-15V, I_D=-6A R_{GEN}=2.5Ω		11		
Turn-on Rise Time	t_r			36		
Turn-off Delay Time	$t_{D(off)}$			182		
Turn-off fall Time	t_f			191		

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

B. T_j=25℃, V_{DD}=20V, V_G=10V, L=0.5mH,I_{AS}=17.4A

C. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =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

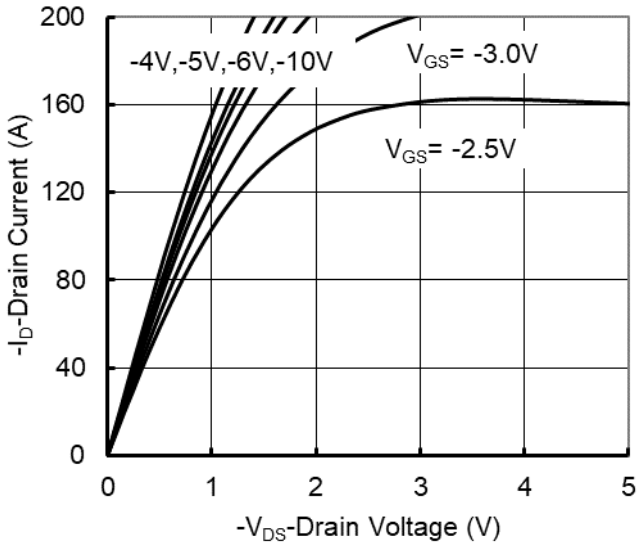


Figure 1. Output Characteristics

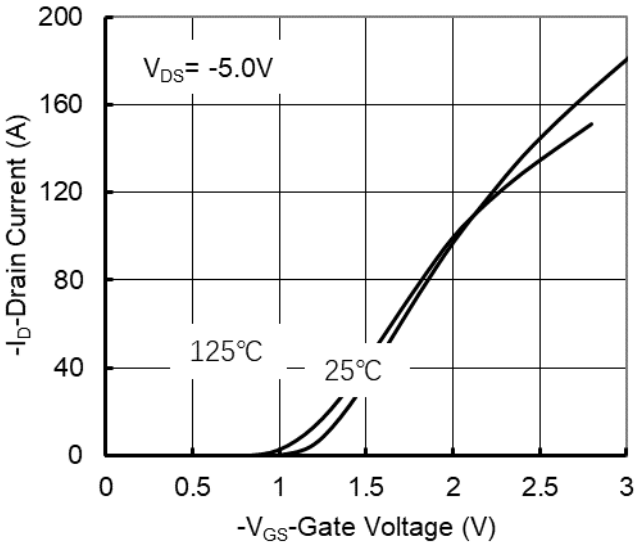


Figure 2. Transfer Characteristics

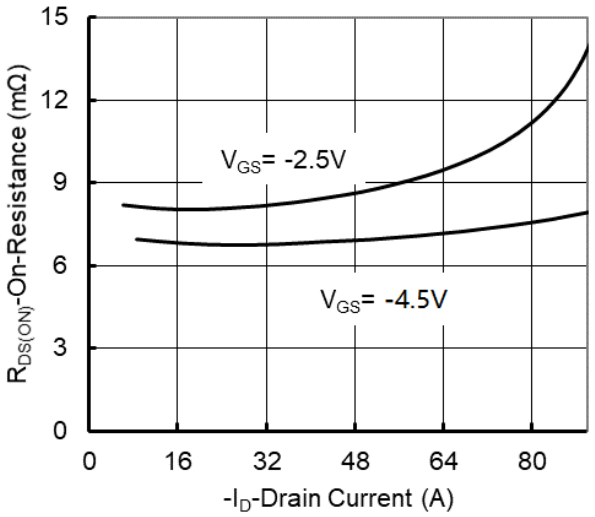


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

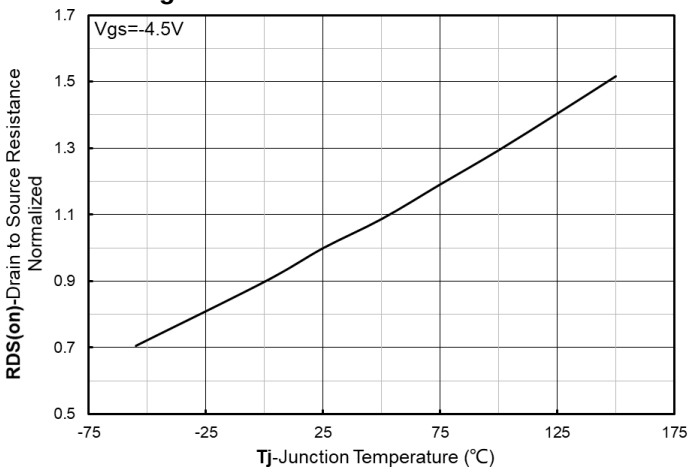


Figure 4. On-Resistance vs. Junction Temperature

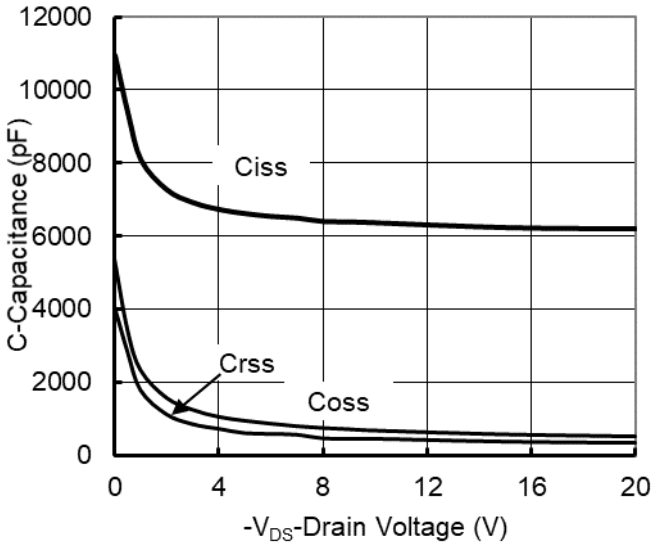


Figure 5. Capacitance Characteristics

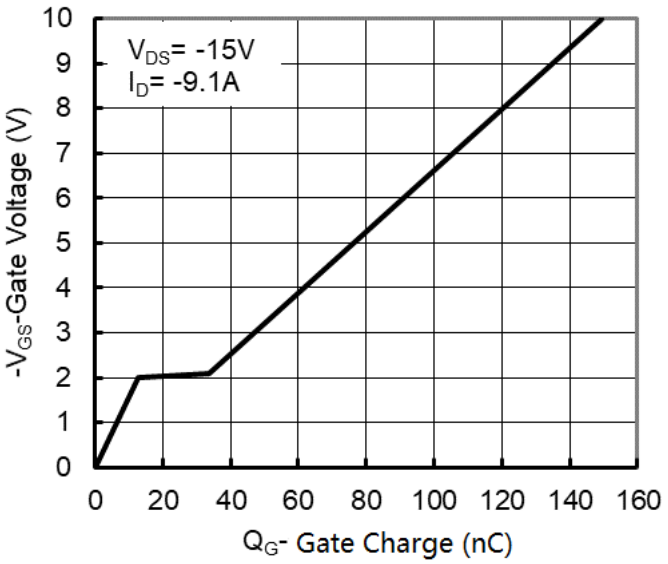


Figure 6. Gate Charge

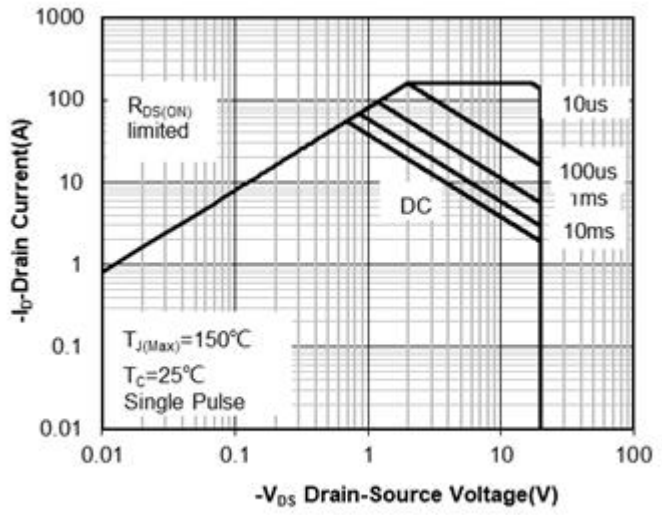


Figure 7. Safe Operation Area

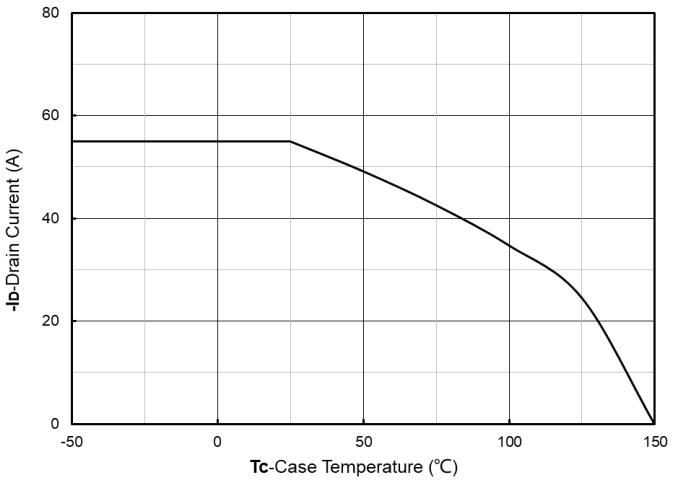


Figure 8. Current dissipation

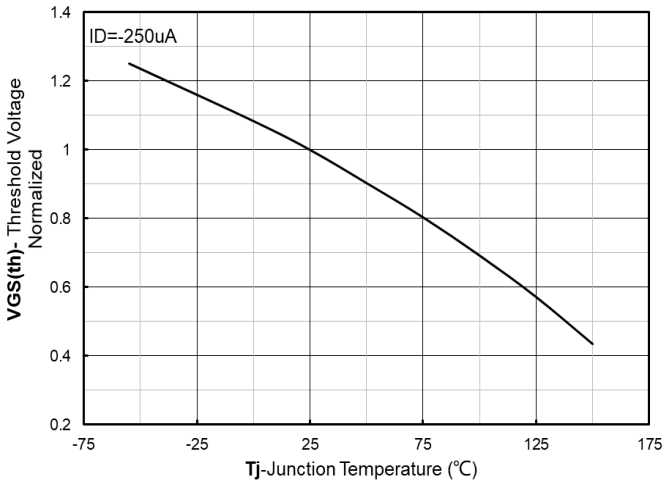


Figure 9. Normalized Threshold voltage

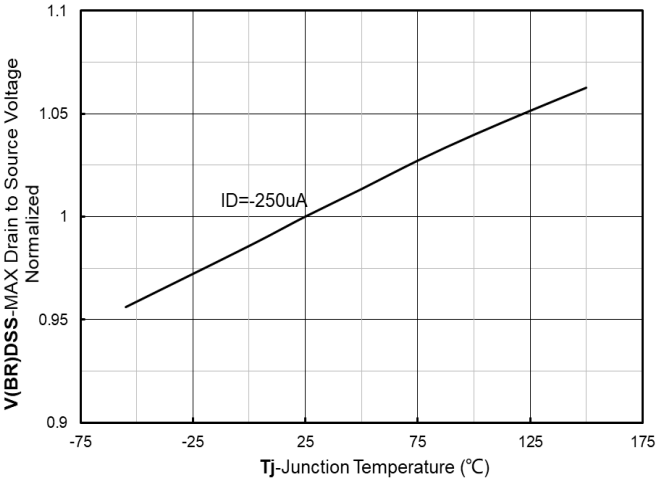


Figure 10. Normalized breakdown voltage

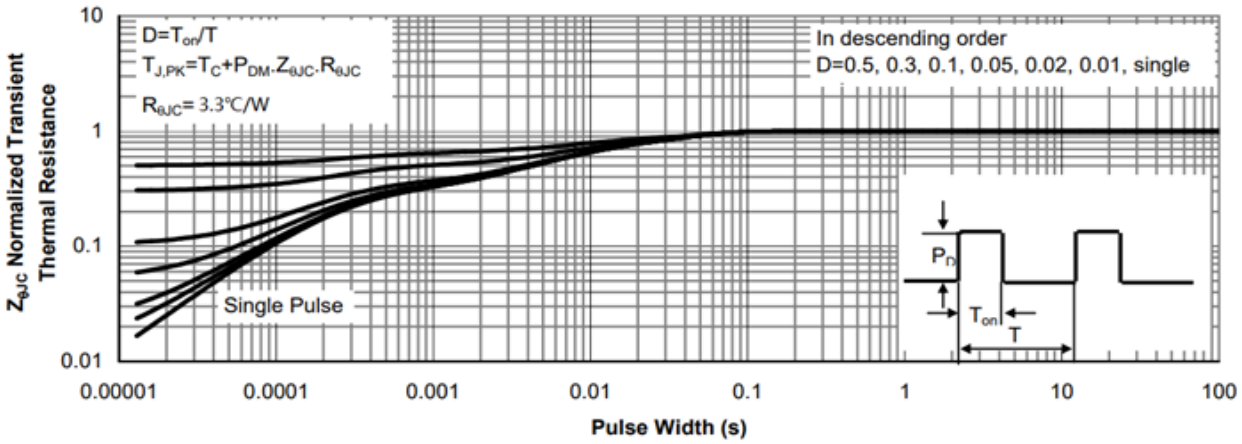
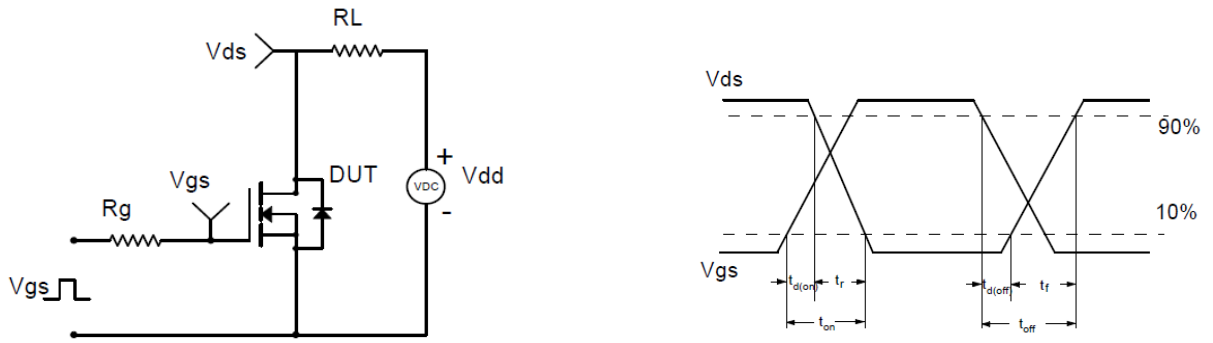
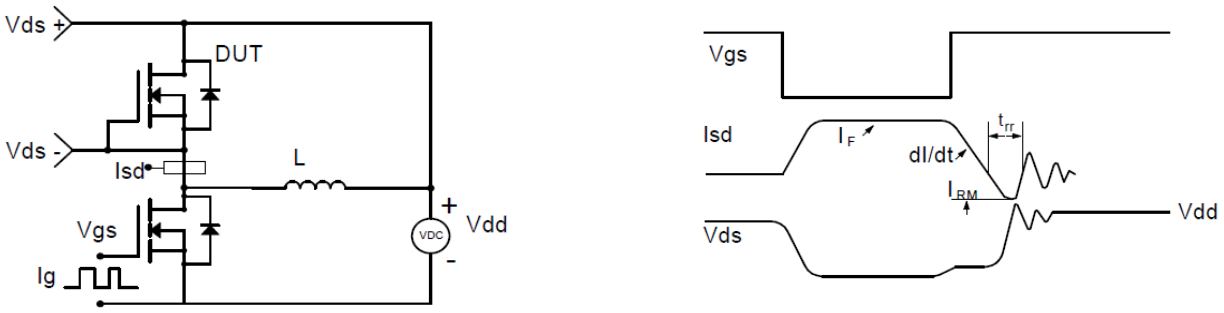


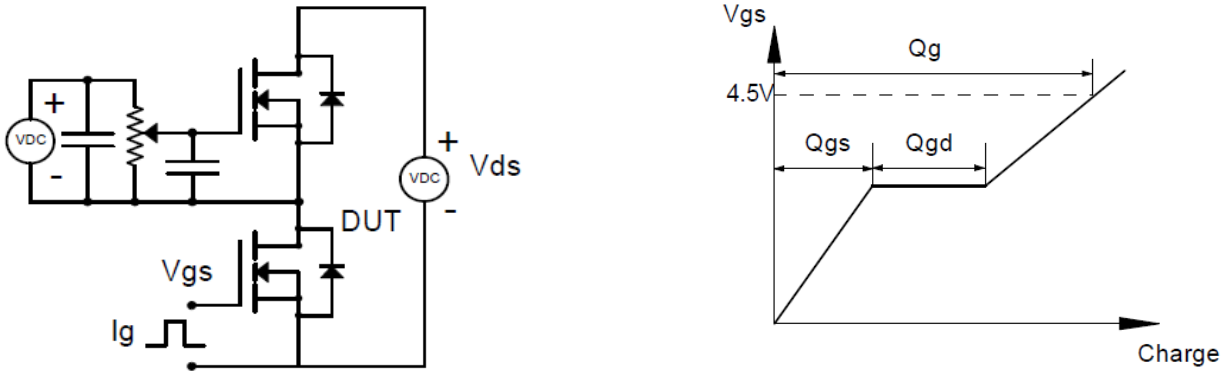
Figure 11. Normalized Maximum Transient Thermal Impedance



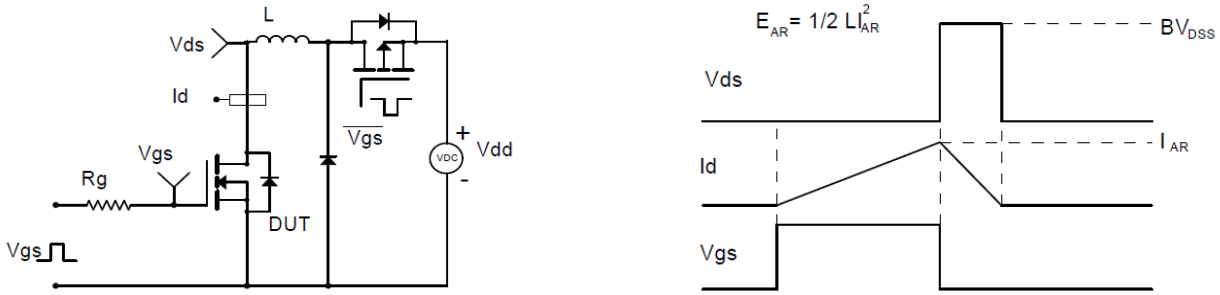
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

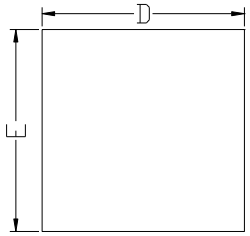


Gate Charge Test Circuit & Waveform

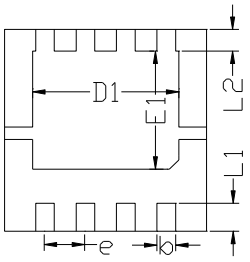


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

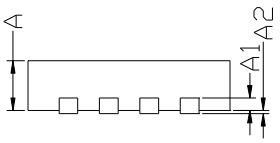
■DFN3333-8L Package information



Top View
正面视图

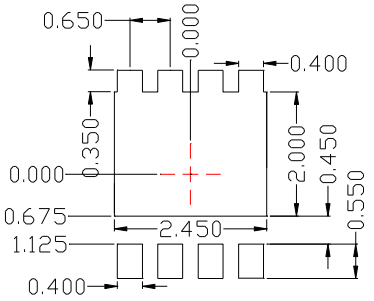


Bottom View
背面视图



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	



Suggested Solder Pad Layout
Top View

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

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