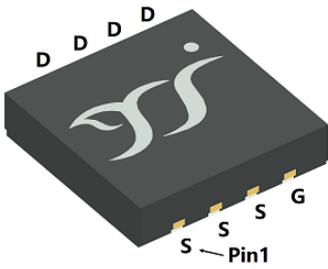
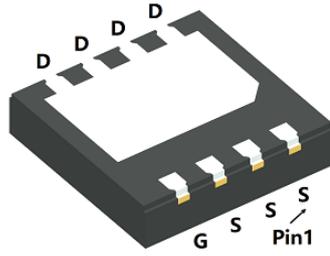


P-Channel Enhancement Mode Field Effect Transistor

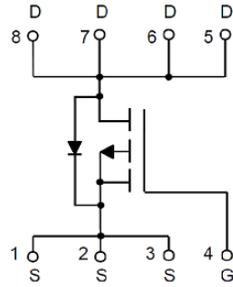


Top View



Bottom View

DFN3333-8L-WF



Product Summary

- VDS -40V
- ID -45A
- RDS(ON)(at VGS=-10V) <13mΩ
- RDS(ON)(at VGS=-4.5V) <17mΩ
- 100% EAS Tested
- 100% ∇VDS 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
- Part no. with suffix "Q" means AEC-Q101 qualified

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC converter

Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			V _{DS}	-	-40	V
Gate-source Voltage			V _{GS}	-20	20	
Continuous Drain Current (Note 1,2)	Steady-State	T _A =25°C, V _{GS} =-10V	I _D	-	-10.9	A
		T _A =100°C, V _{GS} =-10V		-	-6.9	
Continuous Drain Current (Note 1,3)	Steady-State	T _C =25°C, V _{GS} =-10V, Chip limitation		-	-45	
		T _C =100°C, V _{GS} =-10V		-	-28	
Pulsed Drain Current	T _C =25°C, t _p ≤10μs		I _{DM}	-	-180	
Maximum Body-Diode Continuous Current	T _C =25°C		I _S		-38	
Avalanche energy (non-repetitive)	T _J =25°C, V _G =-10V, R _G =25Ω, L=0.5mH, I _{AS} =-23A		EAS	-	132	mJ
Total Power Dissipation (Note 1,2)	Steady-State	T _A =25°C	P _D	-	2.5	W
		T _A =100°C		-	1	
Total Power Dissipation (Note 1,3)	Steady-State	T _C =25°C		-	41.7	
		T _C =100°C		-	16.7	
Junction and Storage Temperature Range			T _J , T _{STG}	-55	150	°C

Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	R _{θJA}	-	50	°C/W
Thermal Resistance Junction-to-Case	Steady-State	R _{θJC}	-	3	

Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJQ013P04AJQ	F1	Q013P04A	5000	10000	100000	13" reel



YJQ013P04AJQ

■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A, T_j=25^\circ C$	-40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-40V, V_{GS}=0V, T_j=25^\circ C$	-	-	-1	μA
		$V_{DS}=-40V, V_{GS}=0V, T_j=150^\circ C$	-	-	-100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V, T_j=25^\circ C$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A, T_j=25^\circ C$	-1	-1.6	-3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-10A, T_j=25^\circ C$	-	10	13	$m\Omega$
		$V_{GS}=-4.5V, I_D=-8A, T_j=25^\circ C$	-	13	17	$m\Omega$
Diode Forward Voltage	V_{SD}	$I_S=-20A, V_{GS}=0V, T_j=25^\circ C$	-	-0.87	-1.2	V
Gate Resistance	R_G	$f=1MHz, T_j=25^\circ C$	-	9	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V, f=1MHz, T_j=25^\circ C$	-	3136	-	pF
Output Capacitance	C_{oss}		-	247	-	
Reverse Transfer Capacitance	C_{rss}		-	225	-	
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=-10V, V_{DS}=-20V, I_D=-25A, T_j=25^\circ C$	-	73.4	-	nC
Gate-Source Charge	Q_{gs}		-	9	-	
Gate-Drain Charge	Q_{gd}		-	15.3	-	
Reverse Recovery Charge	Q_{rr}	$I_F=-25A, di/dt=100A/\mu s, V_{GS}=0V, V_R=-20V, T_j=25^\circ C$	-	25	-	nC
Reverse Recovery Time	t_{rr}		-	92.5	-	ns
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=-10V, V_{DS}=-20V, I_D=-25A, R_{GEN}=6\Omega, T_j=25^\circ C$	-	13.7	-	ns
Turn-on Rise Time	t_r		-	12	-	
Turn-off Delay Time	$t_{D(off)}$		-	201	-	
Turn-off fall Time	t_f		-	92.5	-	

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 $T_A=25^\circ C$. The maximum allowed junction temperature of 150 $^\circ C$. 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)



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Typical Electrical and Thermal Characteristics Diagrams

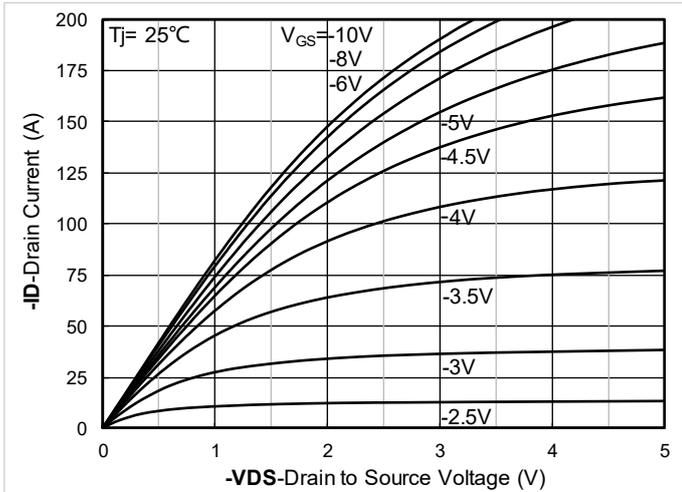


Figure 1. Output Characteristics; typical values

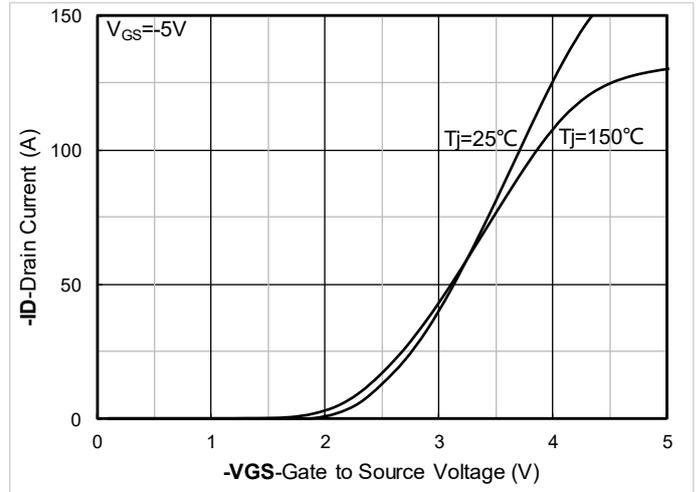


Figure 2. Transfer Characteristics; typical values

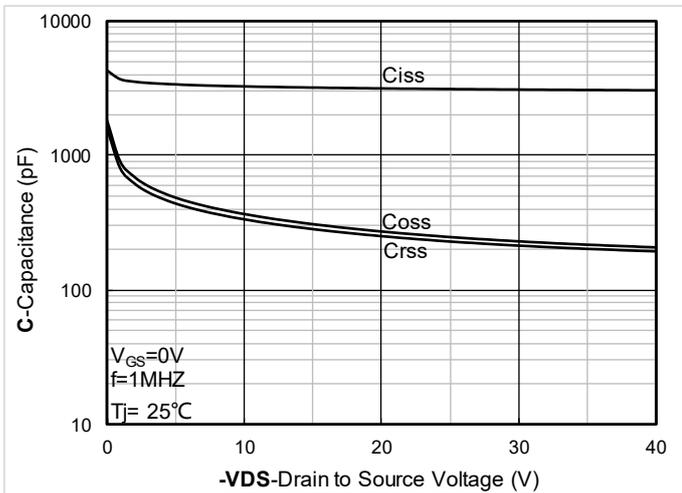


Figure 3. Capacitance Characteristics; typical values

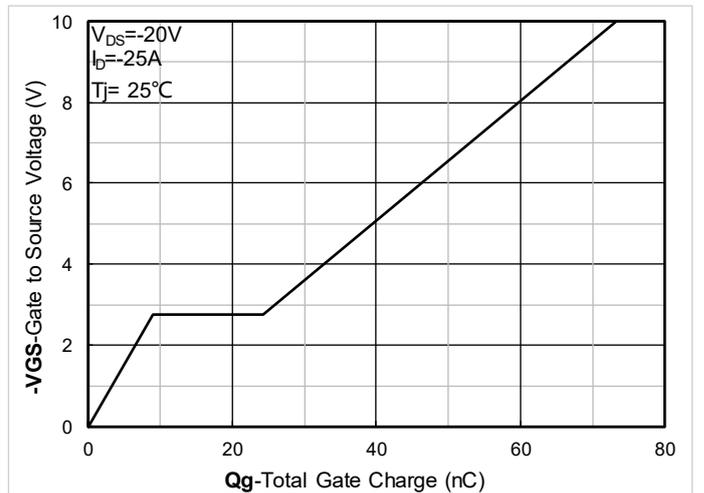


Figure 4. Gate Charge; typical values

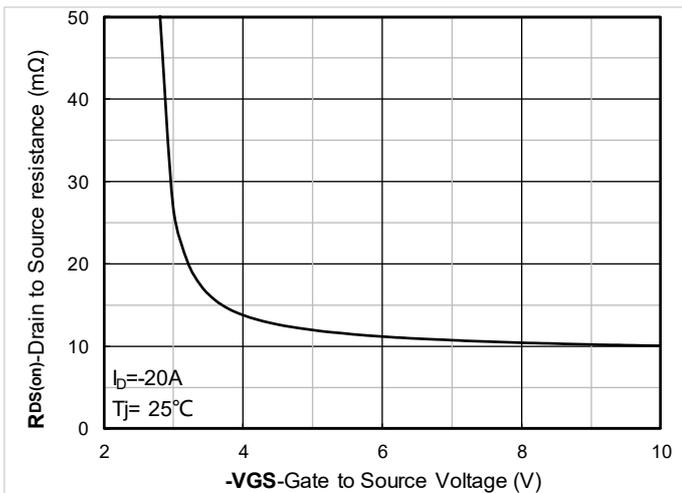


Figure 5. On-Resistance vs Gate to Source Voltage; typical values

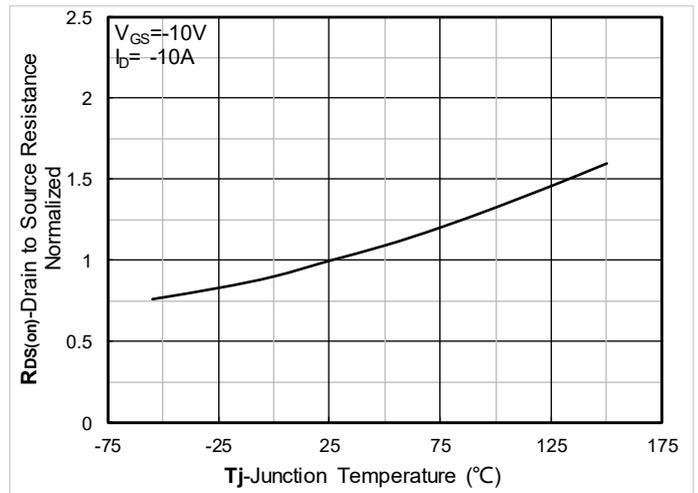


Figure 6. Normalized On-Resistance



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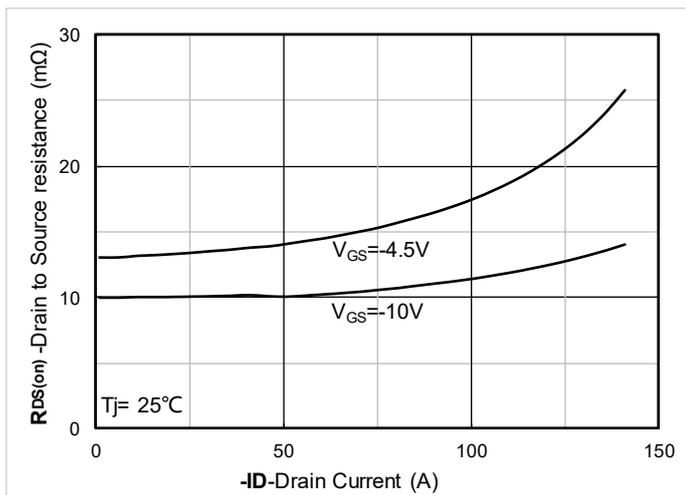


Figure 7. RDS(on) VS Drain Current; typical values

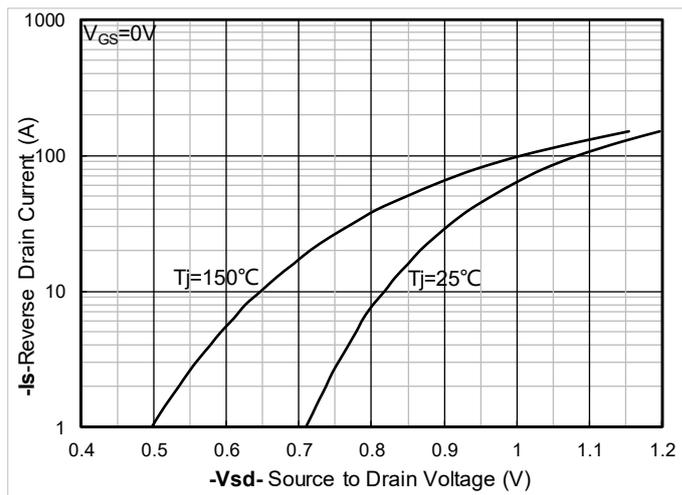


Figure 8. Forward characteristics of reverse diode; typical values

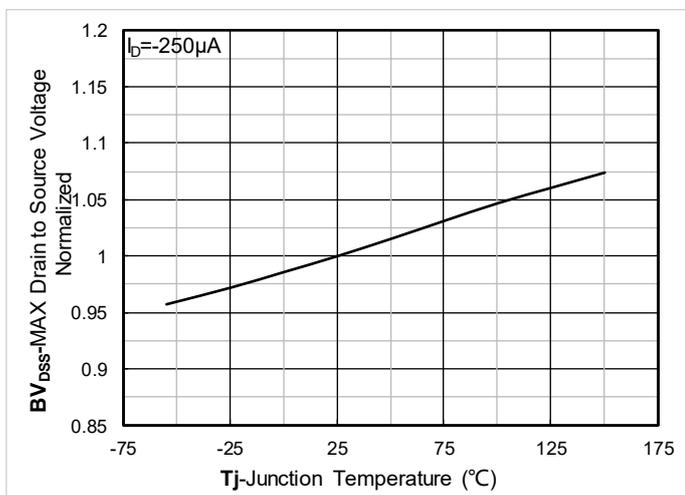


Figure 9. Normalized breakdown voltage

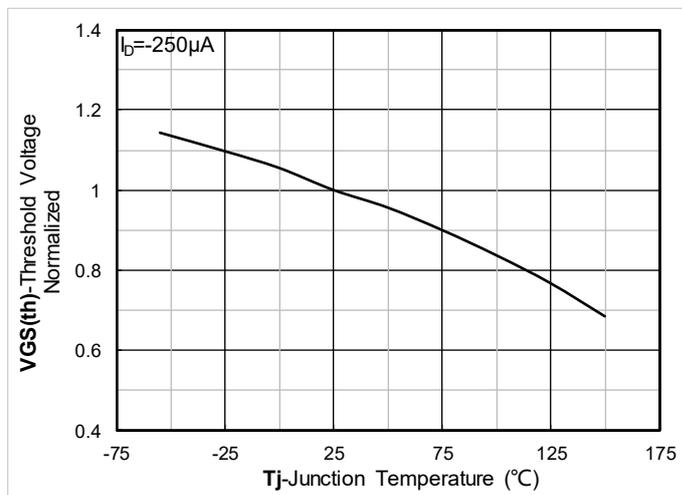


Figure 10. Normalized Threshold voltage

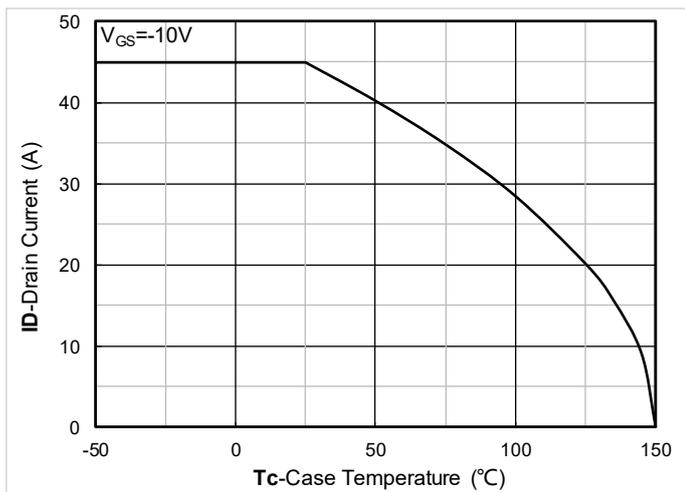


Figure 11. Current dissipation

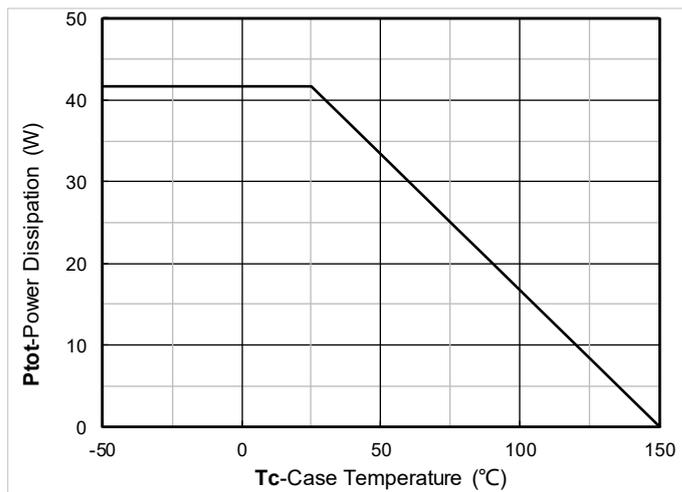


Figure 12. Power dissipation



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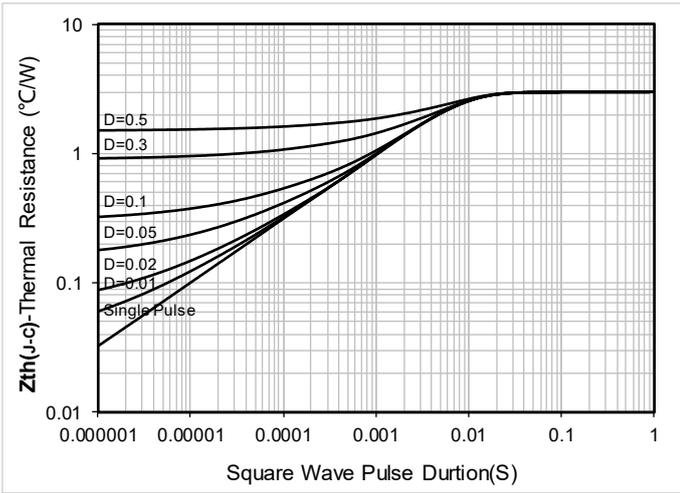


Figure 13. Maximum Transient Thermal Impedance

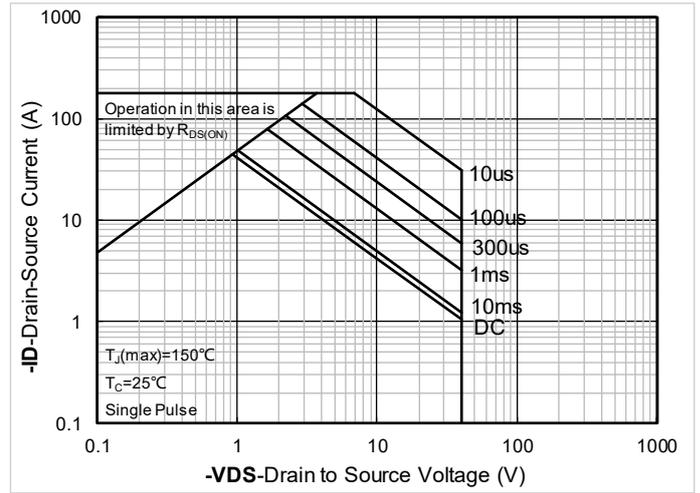
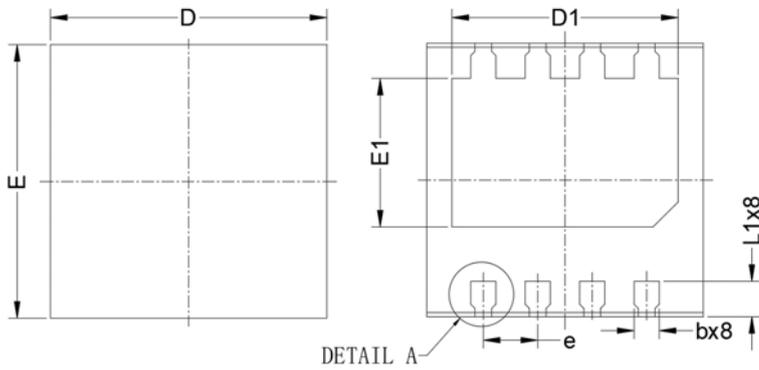


Figure 14. Safe Operation Area



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DFN3333-8L-WF Package information



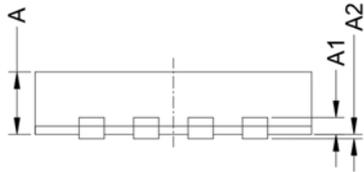
Top View
正面视图

Bottom View
背面视图

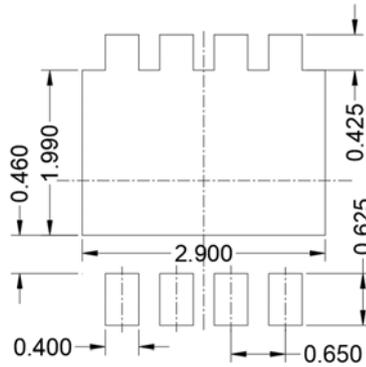
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	3.30 BSC		
E	3.30 BSC		
A	0.70	0.75	0.80
A1	0.203 BSC		
A2			0.10
D1	2.60	2.70	2.80
E1	1.69	1.79	1.89
L1	0.325	0.425	0.525
b	0.20	0.30	0.40
e	0.65 BSC		

Note:

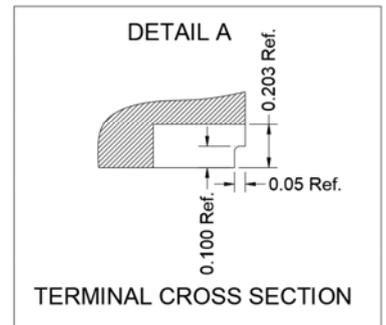
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.10\text{mm}$.
3. The pad layout is for reference purposes only.



Side View
侧面视图



Suggested Solder Pad Layout
Top View





YJQ013P04AJQ

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