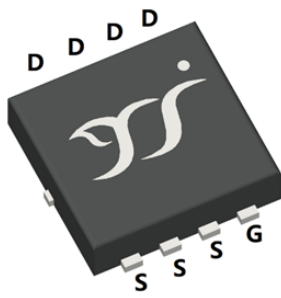
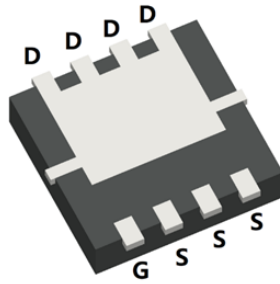




P-Channel Enhancement Mode Field Effect Transistor

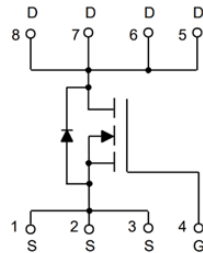


Top View



Bottom View

PDFN3333-8L



Product Summary

• V_{DS}	-30V
• I_D	-37.9A
• $R_{DS(ON)}$ (at $V_{GS}=-10V$)	$<16m\Omega$
• $R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	$<27m\Omega$
• 100% EAS Tested	
• 100% ∇V_{DS} Tested	

General Description

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

Applications

- Battery protection
- Load switch
- Power management

Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			V _{DS}	-	-30	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	-	-8.6	A
		T _A =100°C,V _{GS} =-10V		-	-5.4	
Continuous Drain Current (Note 1,3)	Steady-State	T _C =25°C,V _{GS} =-10V,Chip limitation		-	-37.9	
		T _C =100°C,V _{GS} =-10V		-	-23.9	
Pulsed Drain Current	T _C =25°C,t _p ≤10μs		I _{DM}	-	-151.6	
Maximum Body-Diode Continuous Current	T _C =25°C		I _S		-30	
Avalanche Energy (non-repetitive)	T _J =25°C,V _G =-10V,R _G =25Ω,L=0.5mH,I _{AS} =-14A		EAS	-	49	mJ
Total Power Dissipation (Note 1,2)	Steady-State	T _A =25°C	P _D	-	1.86	W
		T _A =100°C		-	0.74	
Total Power Dissipation (Note 1,3)	Steady-State	T _C =25°C		-	35.7	
		T _C =100°C		-	14.2	
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	$R_{\theta JA}$	-	67	$^{\circ}C/W$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	-	3.5	



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■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V,I _D =-250μA,T _j =25°C	-30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V,V _{GS} =0V,T _j =25°C	-	-	-1	μA
		V _{DS} =-30V,V _{GS} =0V,T _j =125°C	-	-	-100	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V,T _j =25°C	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =-250μA,T _j =25°C	-1	-1.5	-2	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V,I _D =-15A,T _j =25°C	-	12.4	16	mΩ
		V _{GS} =-4.5V,I _D =-7A,T _j =25°C	-	18	27	mΩ
Diode Forward Voltage	V _{SD}	I _S =-15A,V _{GS} =0V,T _j =25°C	-	-0.89	-1.2	V
Gate Resistance	R _G	f=1MHz,T _j =25°C	-	15	-	Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =-15V,V _{GS} =0V,f=1MHz,T _j =25°C	-	1164	-	pF
Output Capacitance	C _{oss}		-	176	-	
Reverse Transfer Capacitance	C _{rss}		-	151	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =-10V,V _{DS} =-15V,I _D =-15A,T _j =25°C	-	26.9	-	nC
Gate-Source Charge	Q _{gs}		-	4.4	-	
Gate-Drain Charge	Q _{gd}		-	3.7	-	
Reverse Recovery Charge	Q _{rr}	I _F =-15A,di/dt=100A/μs,V _{GS} =0V, V _R =-15V,T _j =25°C	-	12.7	-	nC
Reverse Recovery Time	t _{rr}		-	18.4	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =-10V,V _{DS} =-15V,I _D =-15A, R _{GEN} =3Ω,T _j =25°C	-	6.4	-	ns
Turn-on Rise Time	t _r		-	3.3	-	
Turn-off Delay Time	t _{D(off)}		-	67	-	
Turn-off Fall Time	t _f		-	59	-	

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).

■ Typical Electrical and Thermal Characteristics Diagrams

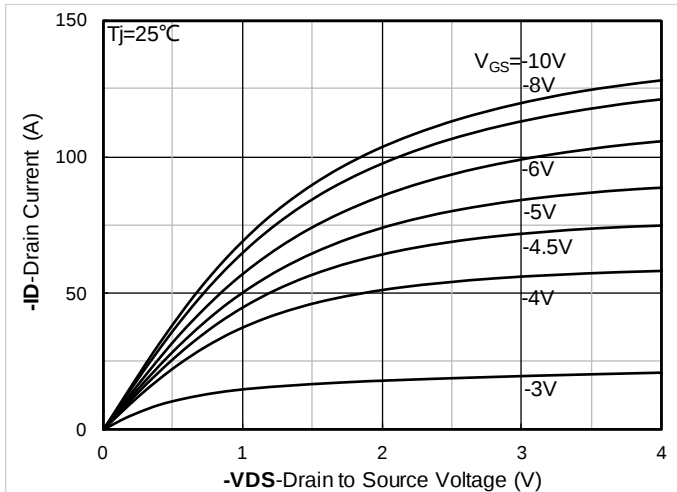


Figure 1. Output Characteristics; typical values

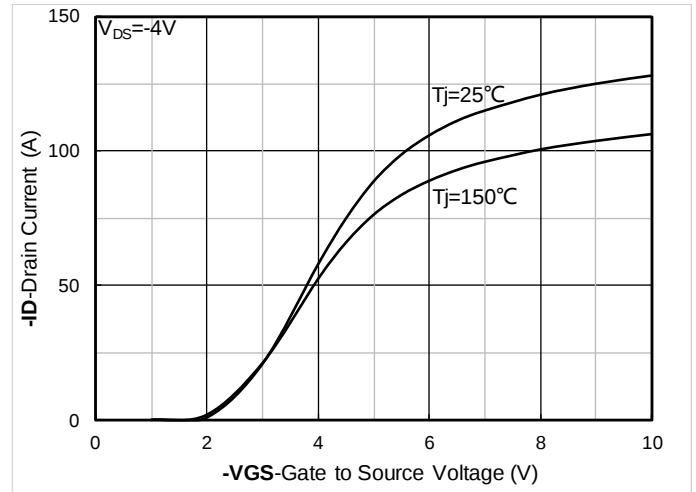


Figure 2. Transfer Characteristics; typical values

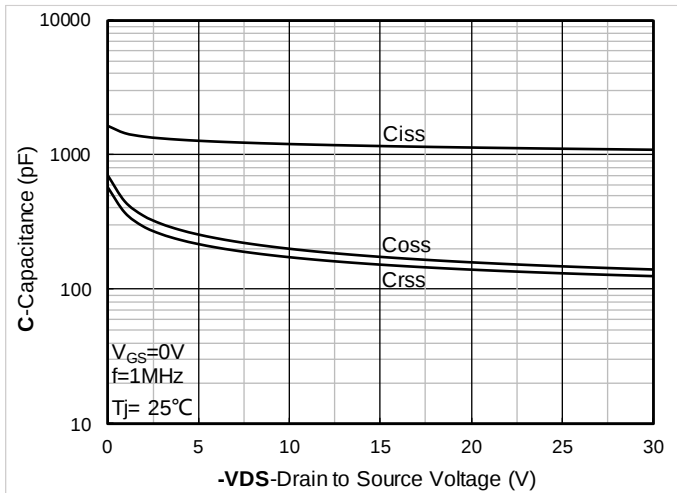


Figure 3. Capacitance Characteristics; typical values

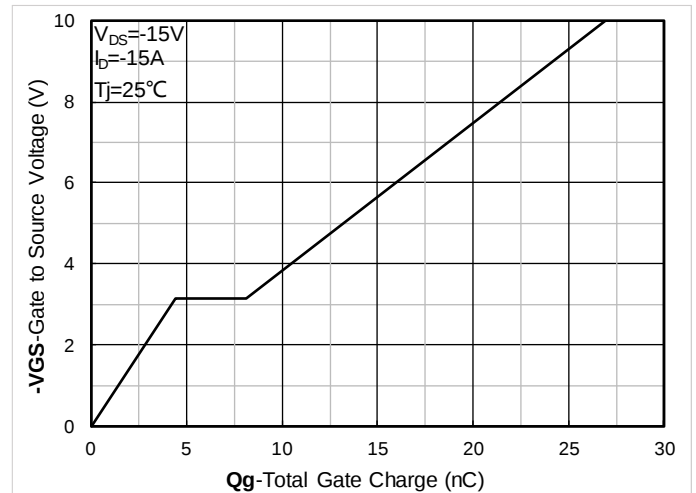


Figure 4. Gate Charge; typical values

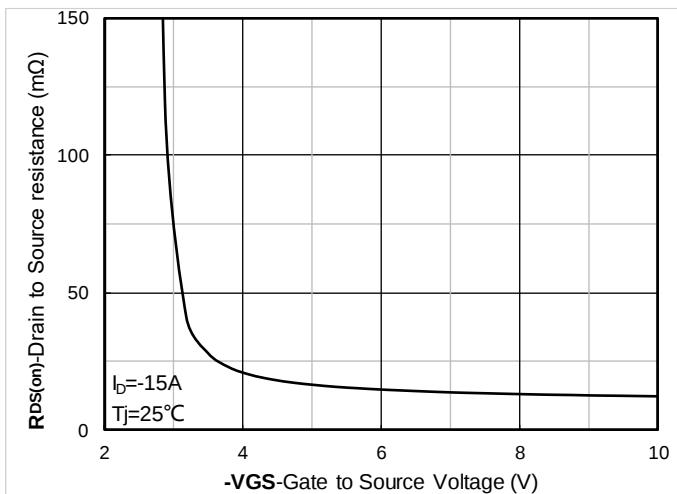


Figure 5. On-Resistance vs Gate to Source Voltage; typical values

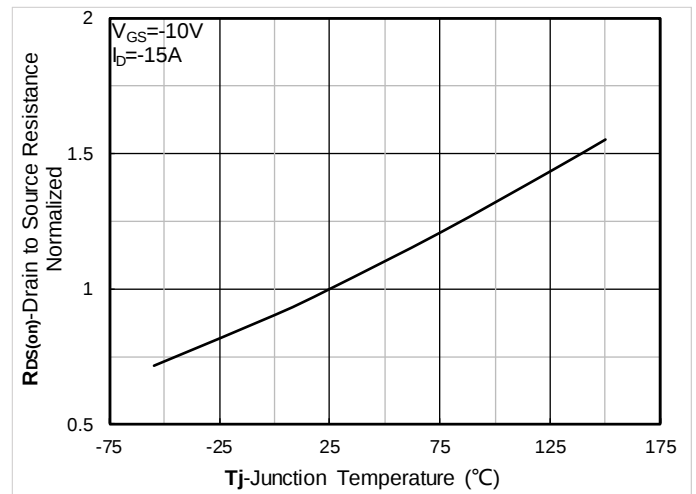


Figure 6. Normalized On-Resistance

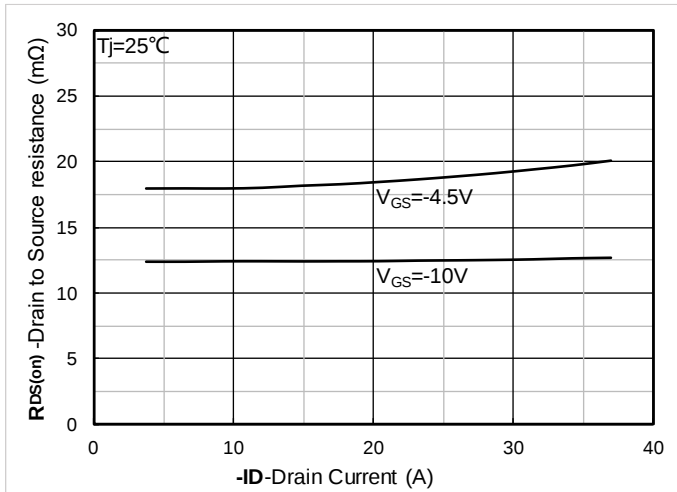


Figure 7. $R_{DS(on)}$ VS Drain Current; typical values

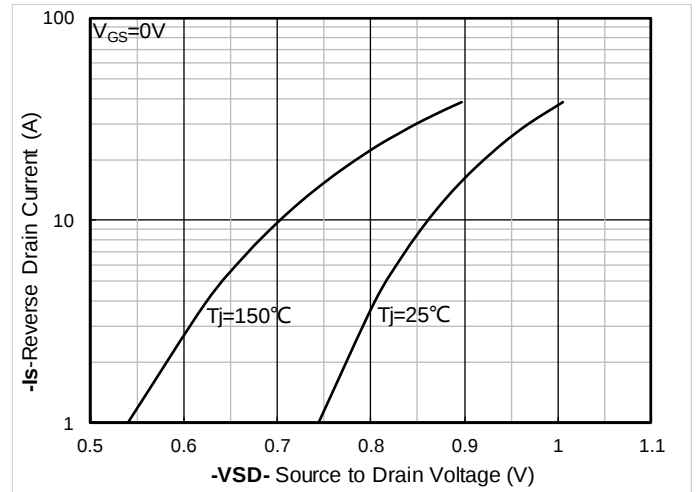


Figure 8. Forward characteristics of reverse diode; typical values

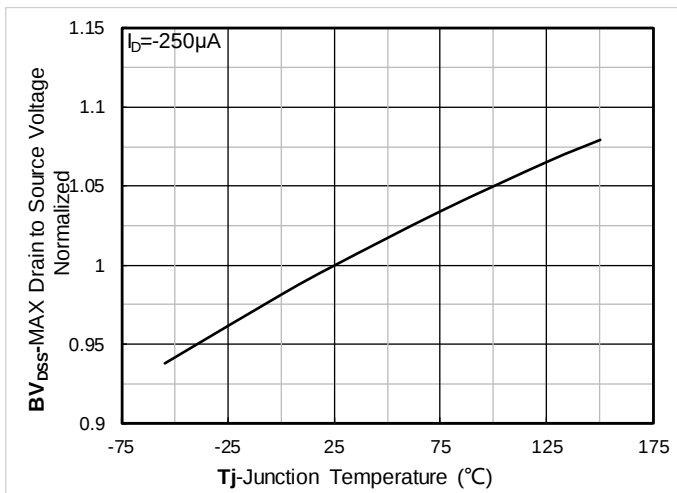


Figure 9. Normalized breakdown voltage

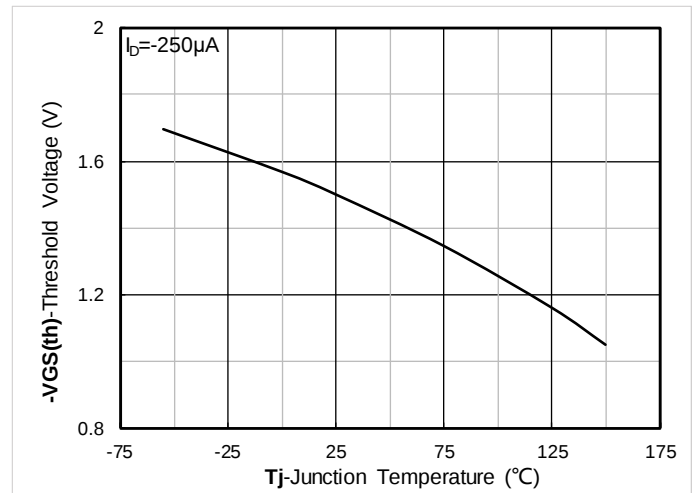


Figure 10. Gate Threshold voltage; typical values

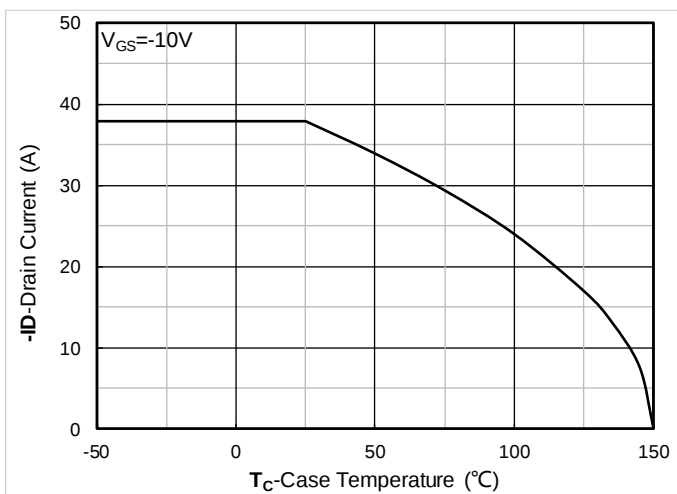


Figure 11. Current dissipation

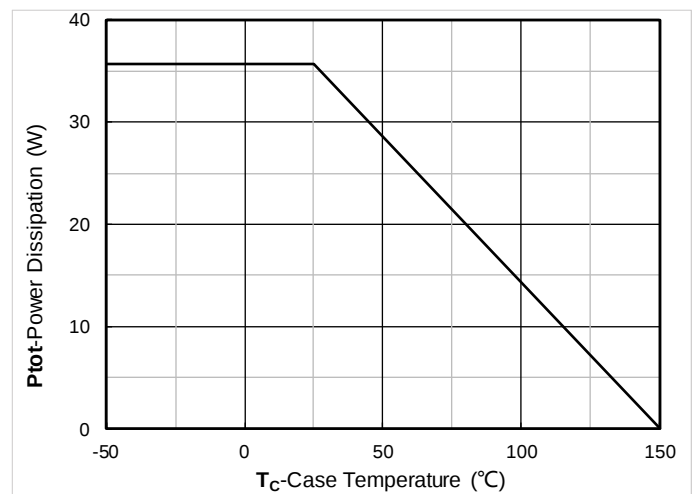


Figure 12. Power dissipation

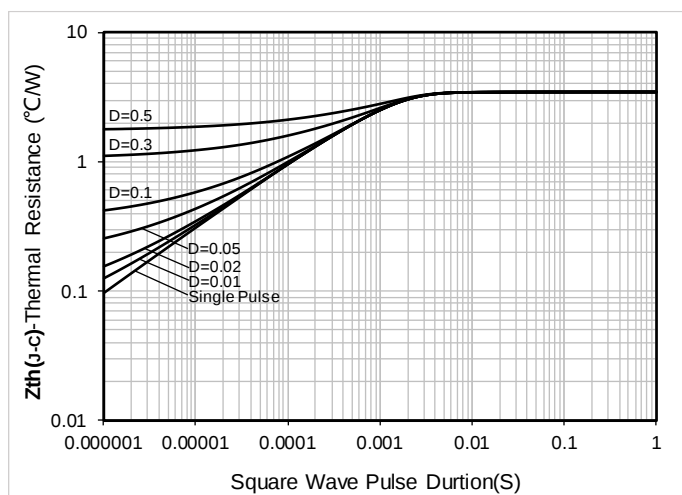


Figure 13. Maximum Transient Thermal Impedance

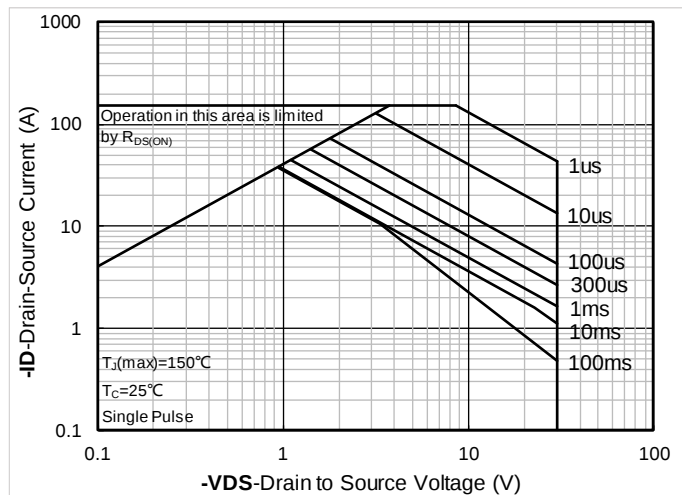
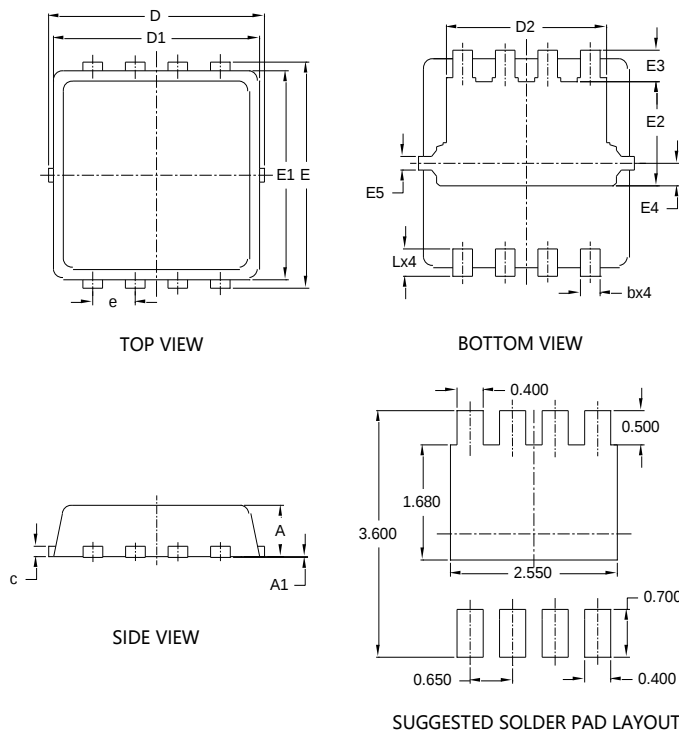


Figure 14. Safe Operation Area



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



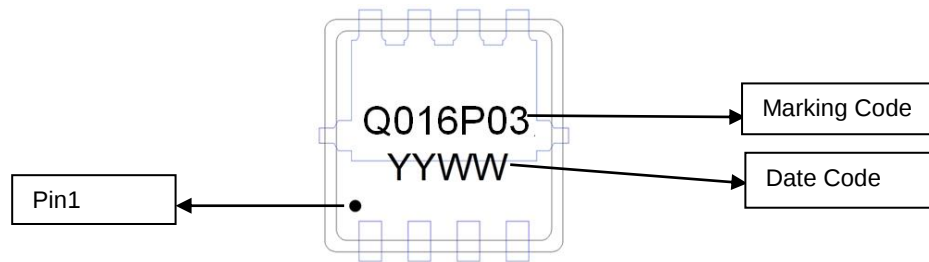
SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.028	0.033	0.700	0.850
A1	0.000	0.002	0.000	0.050
b	0.008	0.016	0.200	0.400
c	0.004	0.010	0.100	0.250
D	0.124	0.136	3.150	3.450
D1	0.118	0.130	3.000	3.300
D2	0.089	0.104	2.250	2.650
E	0.124	0.136	3.150	3.450
E1	0.114	0.126	2.900	3.200
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



■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. YYWW is date code, "YY" is year, "WW" is week
4. Body color: Black



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