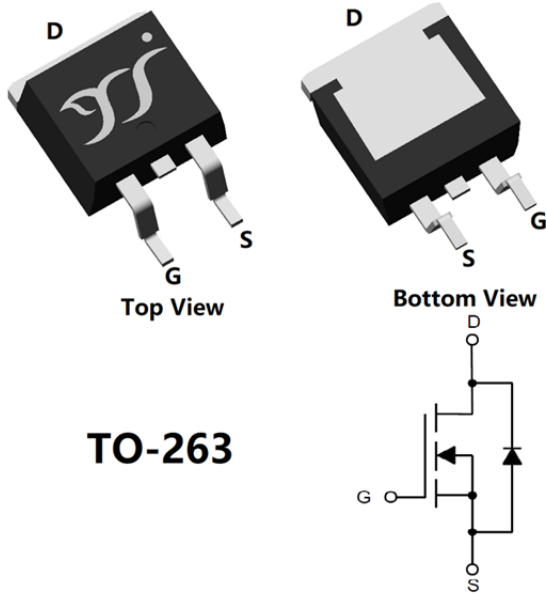


N-Channel Enhancement Mode Field Effect Transistor



TO-263

Product Summary

- V_{DS} 60V
- I_D 43A
- $R_{DS(on)}$ (at $V_{GS}=10V$) $< 16m\Omega$
- 100% EAS Tested
- 100% ∇V_{DS} Tested

General Description

- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery
- Part no. with suffix "Q" means AEC-Q101 qualified

Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply
- DC-DC convertor
- 12V 24V Automotive systems

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	60	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_C=25^\circ C$	I_D	43	A
	$T_C=100^\circ C$		30	
	$T_A=25^\circ C$		9	
	$T_A=100^\circ C$		6	
Pulsed Drain Current ^A		I_{DM}	150	A
Avalanche energy ^B		EAS	81	mJ
Total Power Dissipation ^C	$T_C=25^\circ C$	P_D	75	W
	$T_C=100^\circ C$		38	
	$T_A=25^\circ C$		3.7	
	$T_A=100^\circ C$		1.8	
Junction and Storage Temperature Range		T_J, T_{STG}	$-55 \sim +175$	$^\circ C$



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■ Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient ^D	Steady-State	$R_{\theta JA}$	34	41	°C/W
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	1.7	2	

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJB016N06AHQ	F2	YJB016N06A	800	/	8000	13"Reel

A. Repetitive rating; pulse width limited by max. junction temperature.

B. $T_J=25^{\circ}\text{C}$, $V_{DD}=40\text{V}$, $V_G=10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$, $I_{AS}=18\text{A}$.

C. P_q is based on max. junction temperature, using junction-case thermal resistance.

D. The value of $R_{\theta JA}$ is measured with the device mounted on the minimum recommend pad size, 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.



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■ Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, 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	2	3	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A		12	16	mΩ
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V		0.85	1.3	V
Gate resistance	R _G	f=1MHz		1.3		Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	1850	-	pF
Output Capacitance	C _{oss}		-	165	-	
Reverse Transfer Capacitance	C _{rss}		-	120	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =30V, I _D =27.5A	-	33.6	-	nC
Gate-Source Charge	Q _{gs}		-	7.2	-	
Gate-Drain Charge	Q _{gd}		-	8.7	-	
Reverse Recovery Charge	Q _{rr}	I _F =27.5A, di/dt=100A/us	-	26	-	nC
Reverse Recovery Time	t _{rr}		-	29	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DS} =30V, I _D =27.5A R _{GEN} =2.2Ω	-	11.3	-	ns
Turn-on Rise Time	t _r		-	63	-	
Turn-off Delay Time	t _{D(off)}		-	22	-	
Turn-off fall Time	t _f		-	3.7	-	



■ Typical Electrical and Thermal Characteristics Diagrams

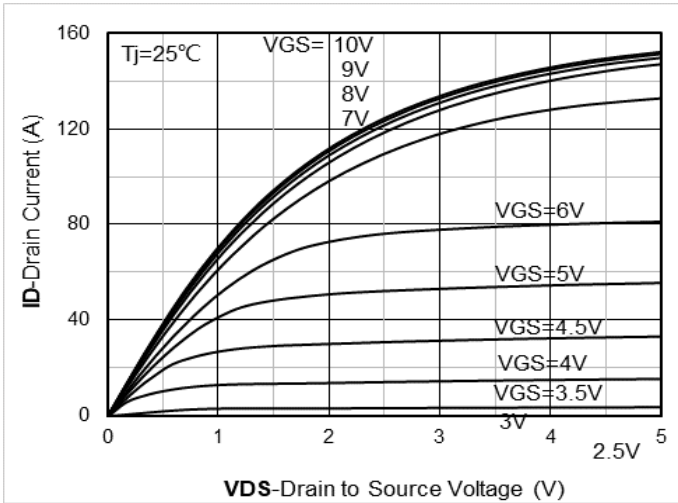


Figure 1. Output Characteristics

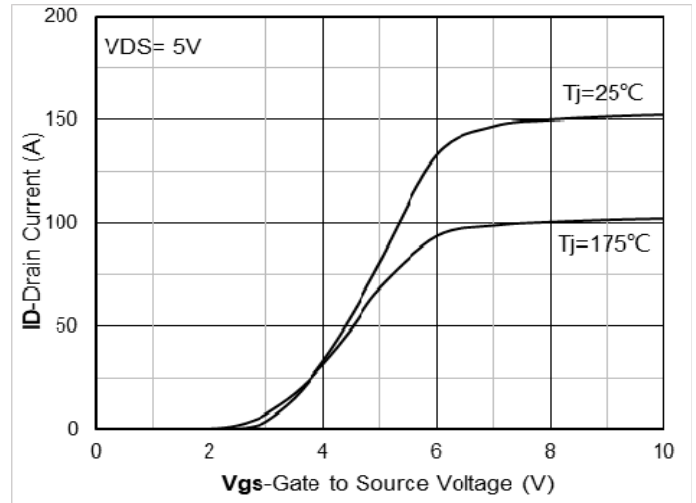
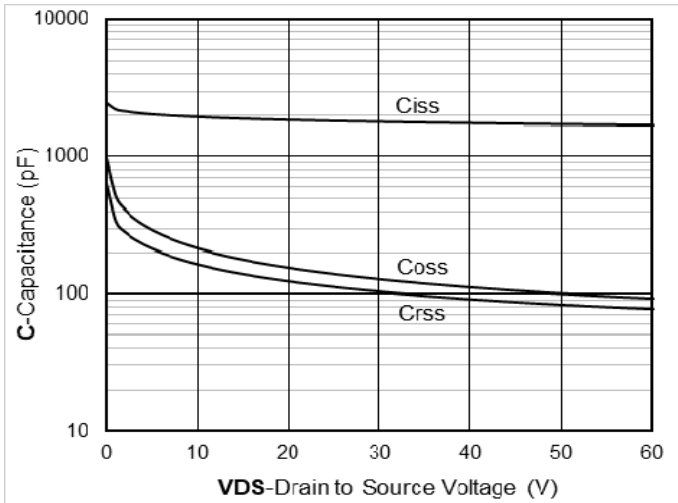


Figure 2. Transfer Characteristics



3. Capacitance Characteristics

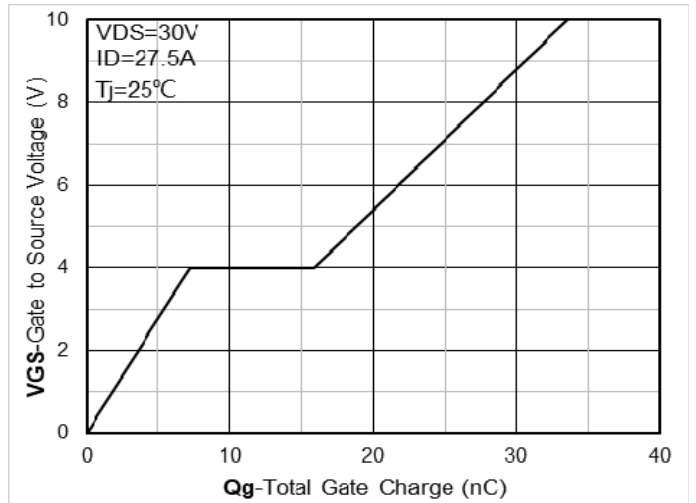


Figure 4. Gate Charge

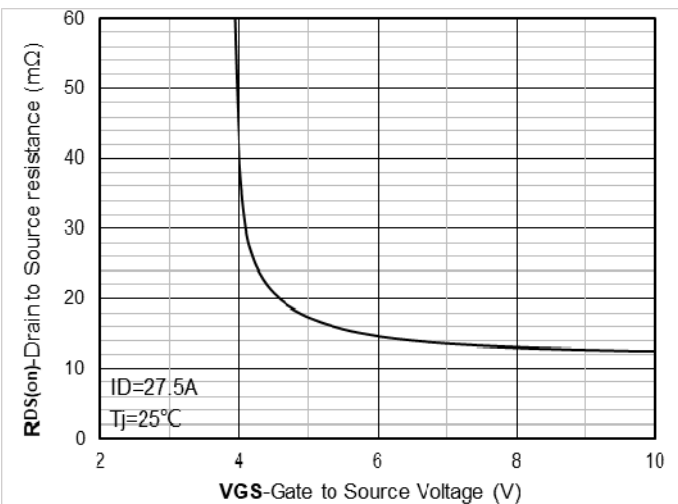


Figure 5. On-Resistance vs Gate to Source Voltage

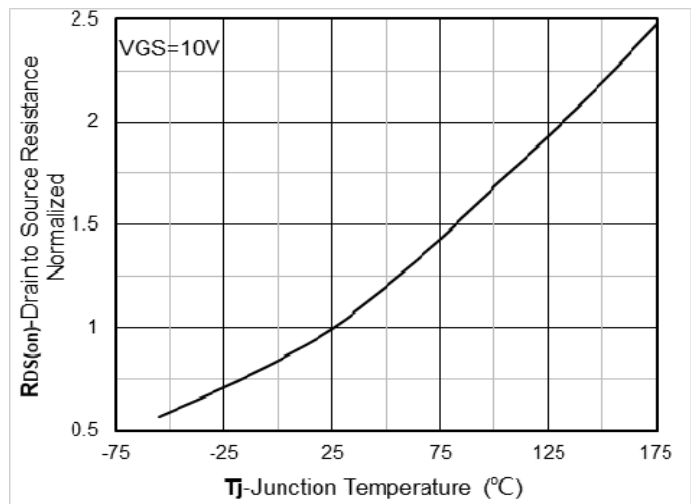


Figure 6. Normalized On-Resistance

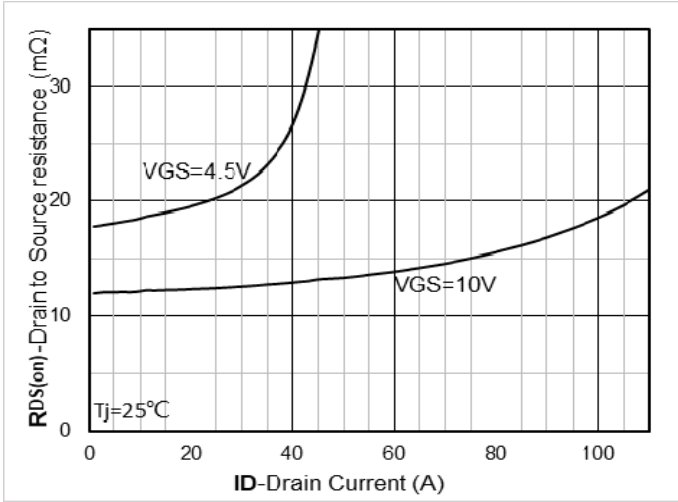


Figure 7. RDS(on) VS Drain Current

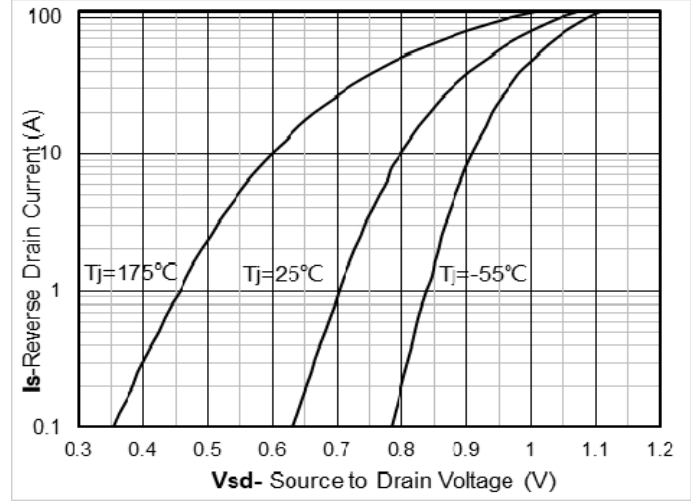


Figure 8. Forward characteristics of reverse diode

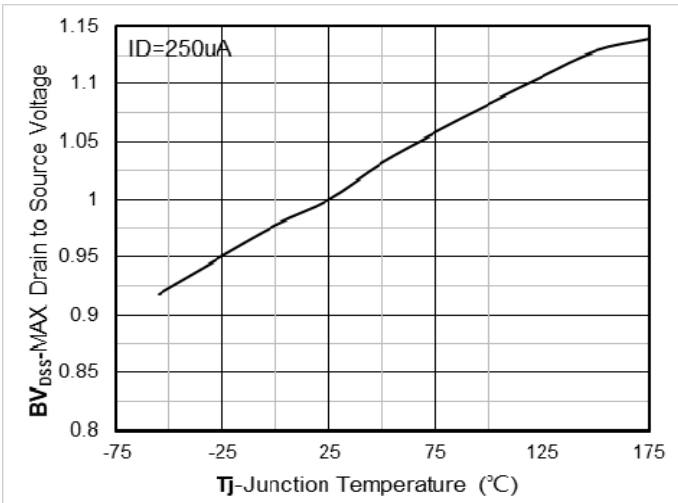


Figure 9. Normalized breakdown voltage

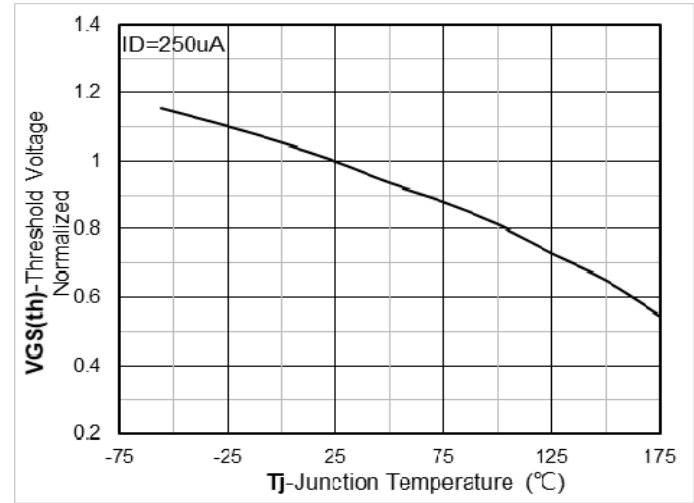


Figure 10. Normalized Threshold voltage

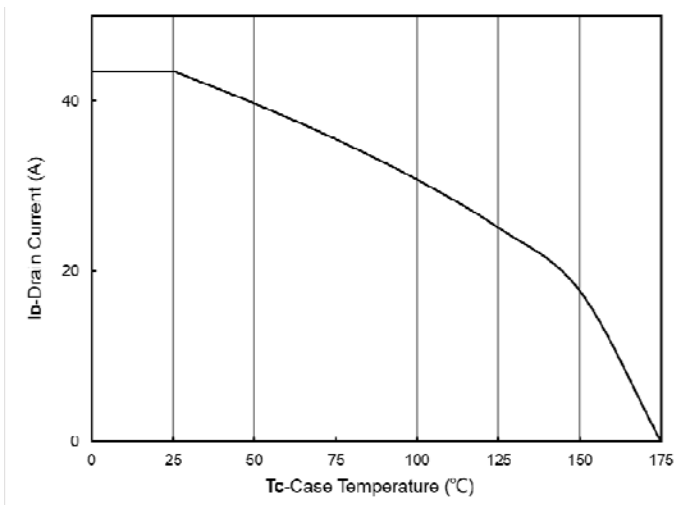


Figure 11. Current dissipation

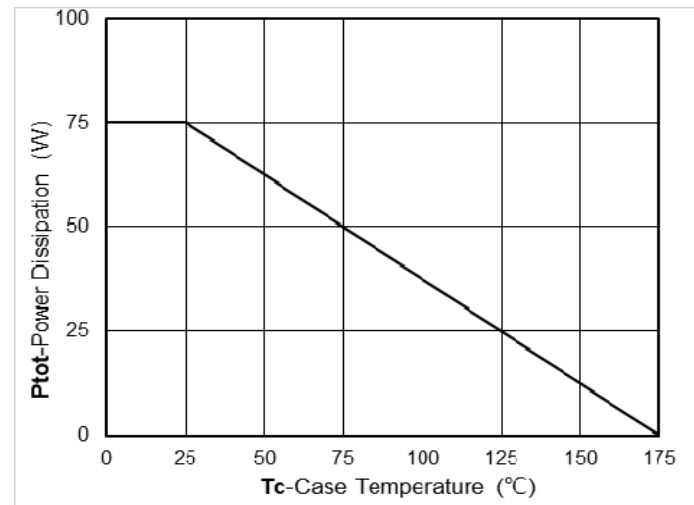


Figure 12. Power dissipation



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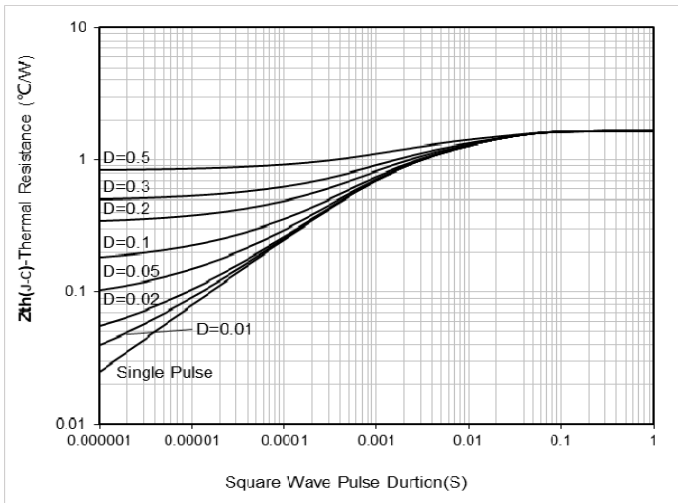


Figure 13. Maximum Transient Thermal Impedance

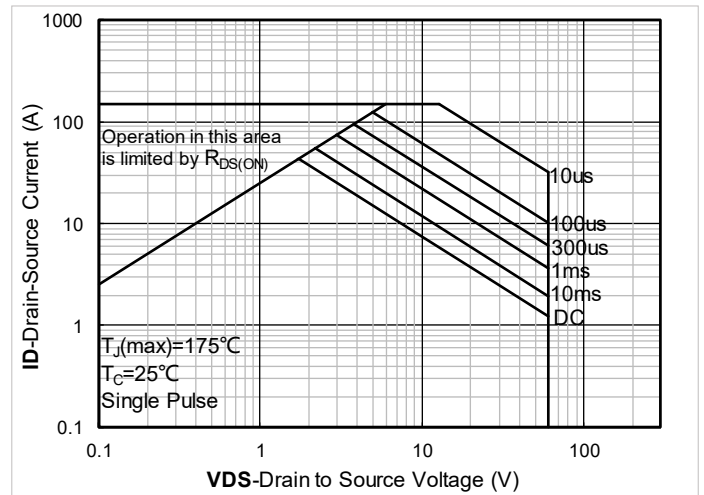
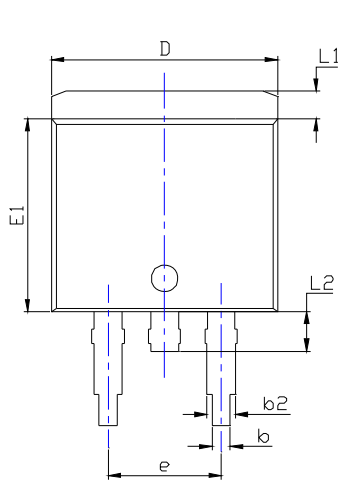


Figure 14. Safe Operation Area

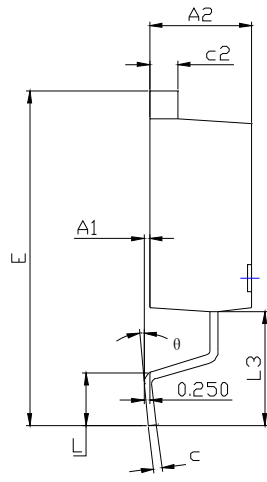


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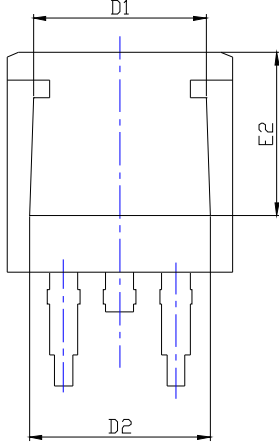
TO-263-HY Package information



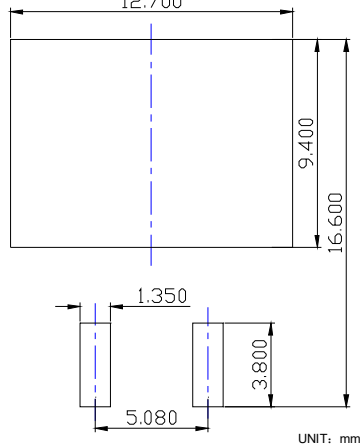
TOP VIEW



SIDE VIEW



BOTTOM VIEW



SUGGESTED SOLDER PAD LAYOUT

SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NDM.	MAX.	MIN.	NDM.	MAX.
A1	0.000	---	0.010	0.000	---	0.250
A2	0.174	0.180	0.186	4.430	4.580	4.730
b	0.028	0.032	0.036	0.720	0.820	0.920
b2	0.046	0.050	0.054	1.180	1.280	1.380
c	0.013	0.015	0.018	0.330	0.390	0.450
c2	0.048	0.050	0.053	1.220	1.280	1.340
D	0.394	0.400	0.406	10.000	10.150	10.300
D1	0.295	0.307	0.319	7.500	7.800	8.100
D2	0.303	0.315	0.327	7.700	8.000	8.300
E	0.571	0.591	0.610	14.500	15.000	15.500
E1	0.337	0.341	0.348	8.550	8.700	8.850
E2	0.276	0.287	0.299	7.000	7.300	7.600
e	0.200BSC			5.080BSC		
L	0.070	---	0.110	1.790	---	2.790
L1	0.044	---	0.056	1.120	---	1.420
L2	0.030	---	0.070	0.770	---	1.770
L3	0.197REF			5.000REF		
theta	0°	---	8°	0°	---	8°

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.

Marking Information





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