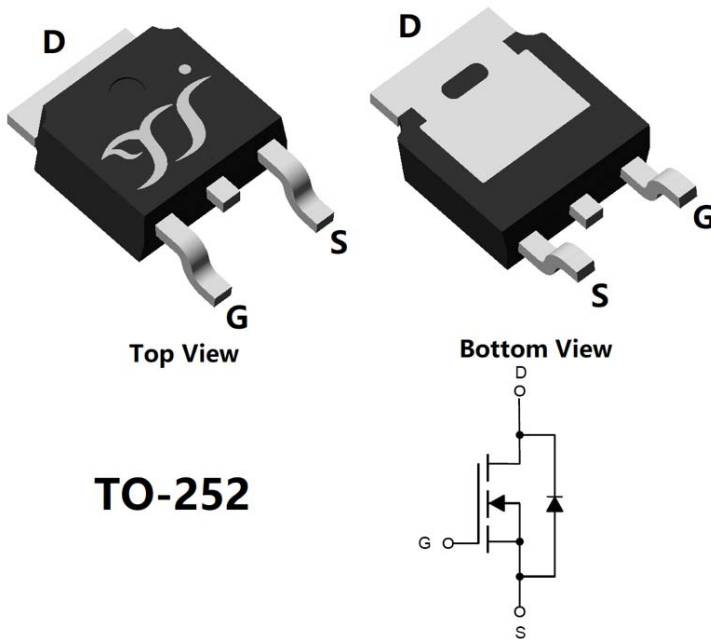


N-Channel Enhancement Mode Field Effect Transistor



TO-252

Product Summary

- V_{DS} 20V
- I_D 30A
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <8mohm
- $R_{DS(ON)}$ (at $V_{GS}=2.5V$) <9mohm
- $R_{DS(ON)}$ (at $V_{GS}=1.8V$) <14mohm
- 100% ∇V_{DS} Tested
- 100% EAS Tested

General Description

- Trench Power MV MOSFET technology
- 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

- High current load applications
- Load switch
- Hard switched and high frequency circuits
- Uninterruptible power supply

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	20	V
Gate-source Voltage		V_{GS}	± 10	V
Drain Current	$T_C=25^\circ\text{C}$	I_D	30	A
	$T_C=100^\circ\text{C}$		19	
Pulsed Drain Current ^A		I_{DM}	125	A
Total Power Dissipation	$T_C=25^\circ\text{C}$	P_D	25	W
	$T_C=100^\circ\text{C}$		10	W
Single Pulse Avalanche Energy ^B		E_{AS}	64	mJ
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	5	$^\circ\text{C/W}$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	$^\circ\text{C}$

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJD30N02A	F1/F2	YJD30N02A	2500	/	25000	13" reel



YJD30N02A

■ 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
Gate-Body Leakage Current	I _{GSS1}	V _{GS} =±10V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	0.45	0.62	1.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =15A		5.6	8	mΩ
		V _{GS} =2.5V, I _D =7A		7.1	9	
		V _{GS} =1.8V, I _D =3A		10	14	
Diode Forward Voltage	V _{SD}	I _S =15A, V _{GS} =0V			1.2	V
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHZ		1650		pF
Output Capacitance	C _{oss}			266		
Reverse Transfer Capacitance	C _{rss}			206		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =10V, I _D =30A		46.8		nC
Gate-Source Charge	Q _{gs}			4.6		
Gate-Drain Charge	Q _{gd}			7.3		
Reverse Recovery Chrage	Q _{rr}	I _F =30A, di/dt=100A/us		5.8		ns
Reverse Recovery Time	t _{rr}			19.5		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DS} =10V, I _D =30A R _{GEN} =3Ω		13		
Turn-on Rise Time	t _r			110		
Turn-off Delay Time	t _{D(off)}			40		
Turn-off fall Time	t _f			105		

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

B. T_J=25℃, V_{DD}=15V, V_G=5V, L=0.5mH, I_{AS}=16A



■ Typical Performance Characteristics

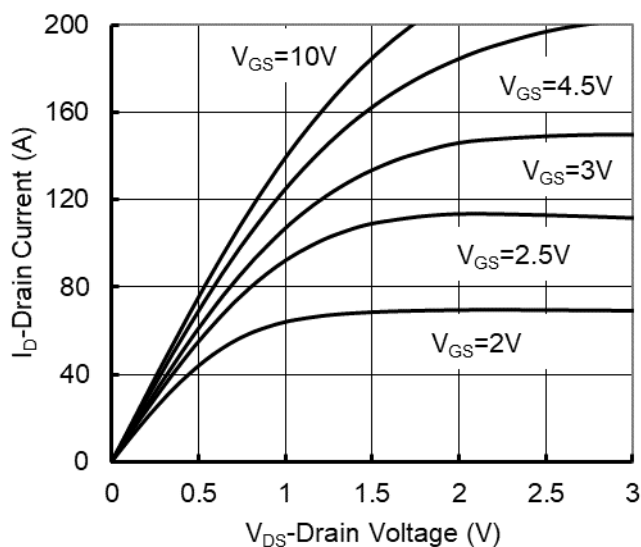


Figure1. Output Characteristics

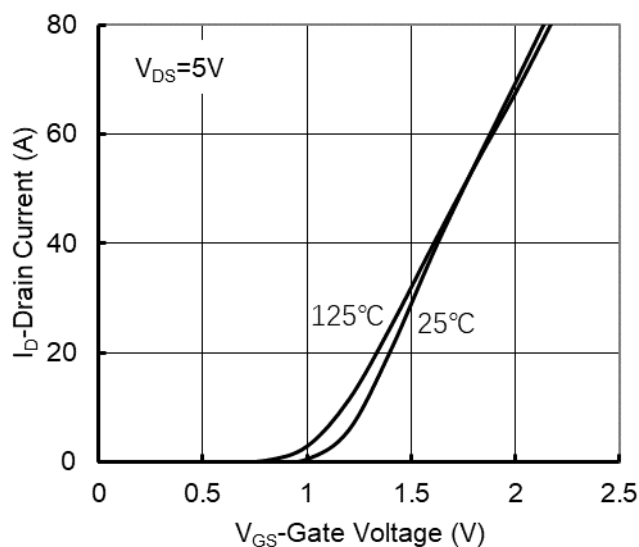


Figure2. Transfer Characteristics

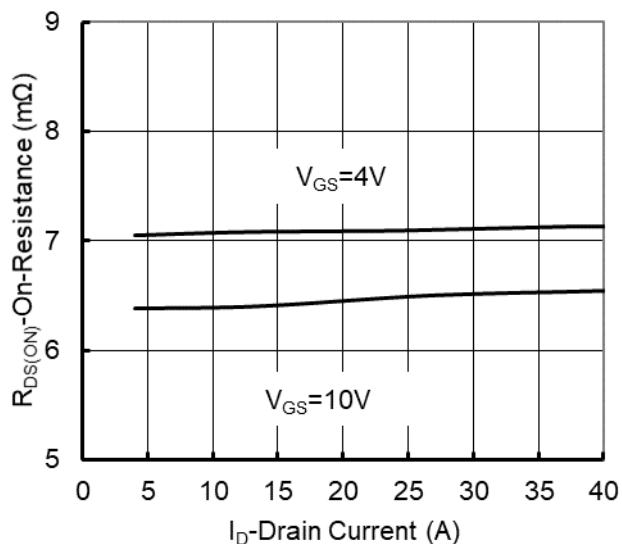


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

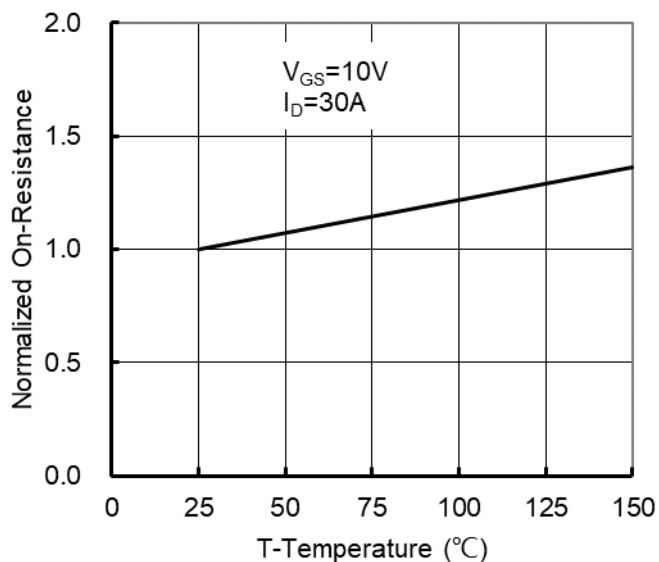


Figure 4: On-Resistance vs. Junction Temperature

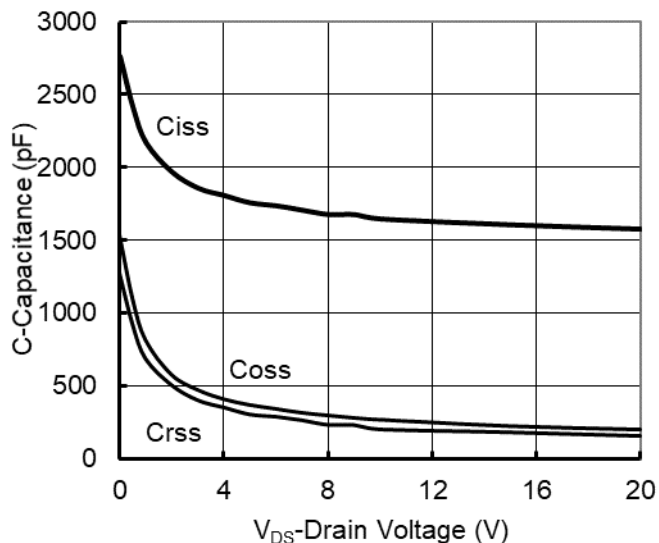


Figure5. Capacitance Characteristics

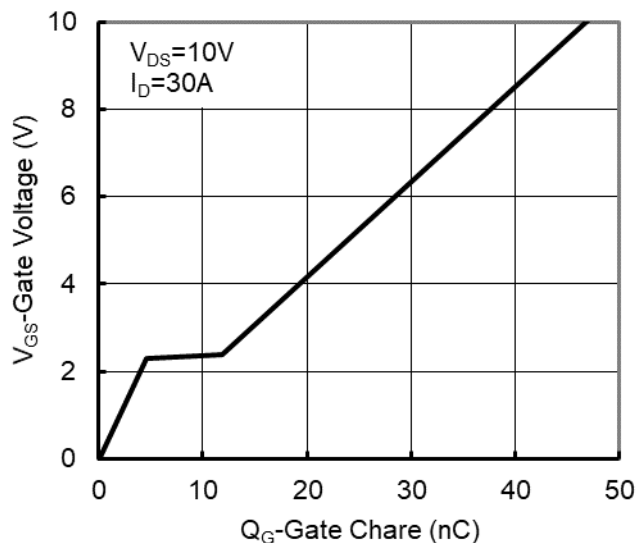
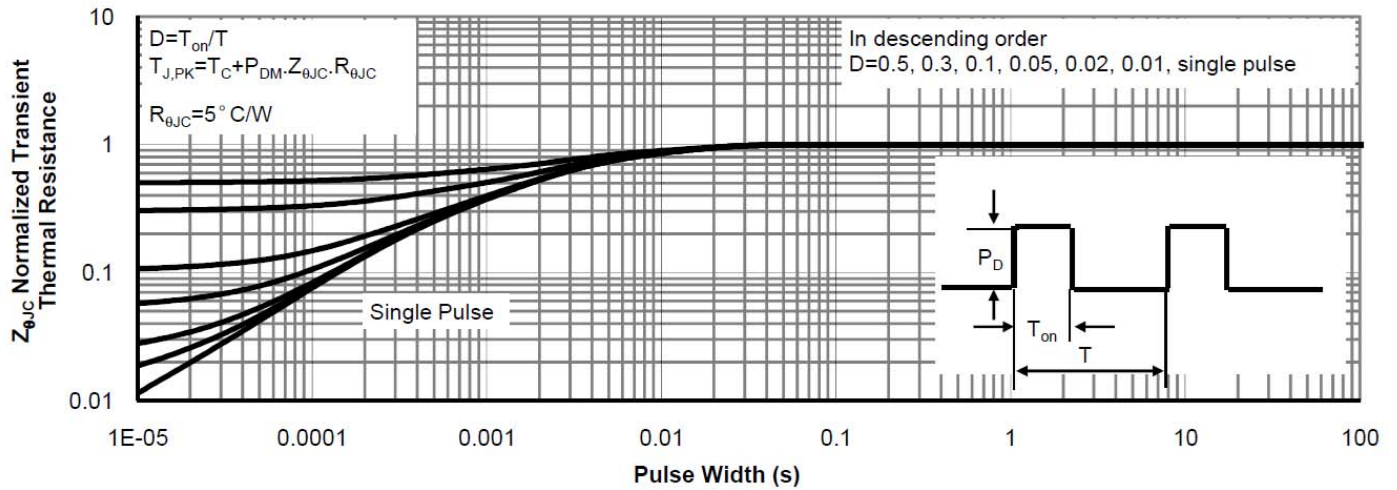
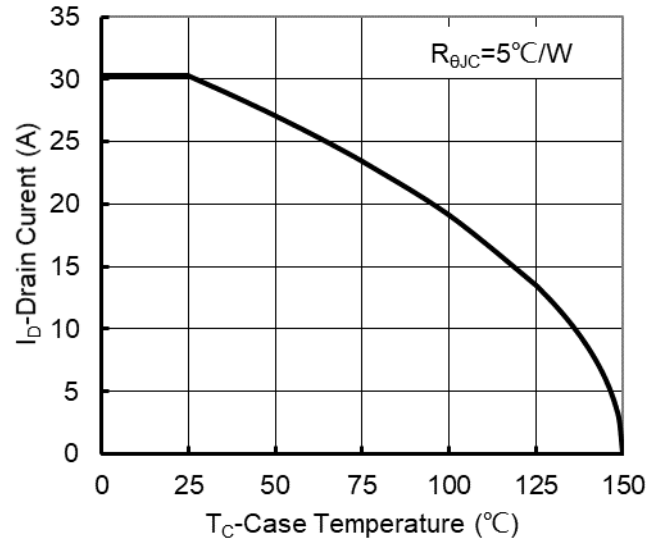
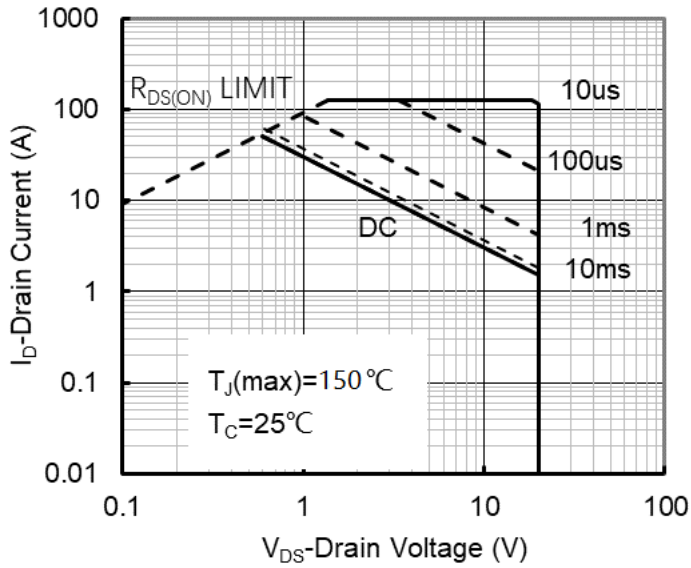
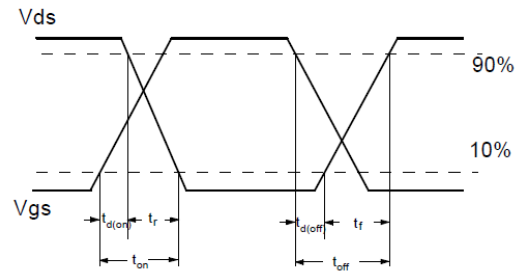
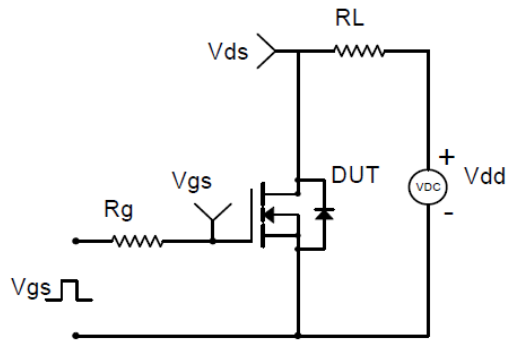
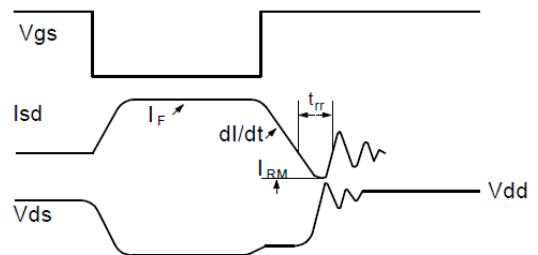
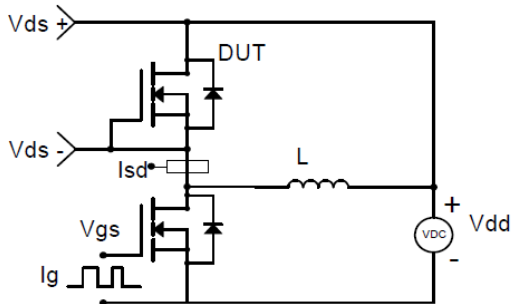


Figure6. Gate Charge

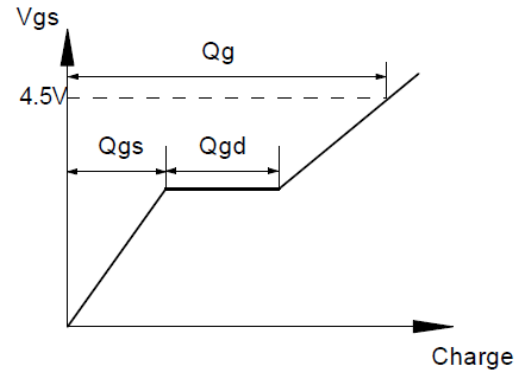
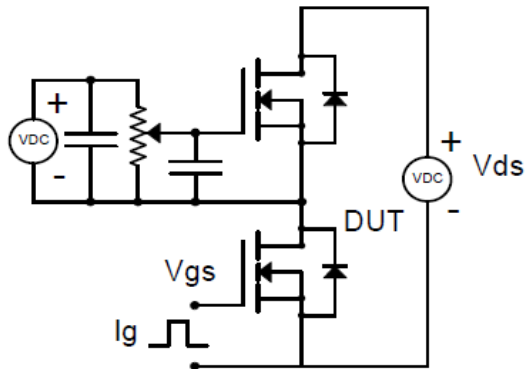




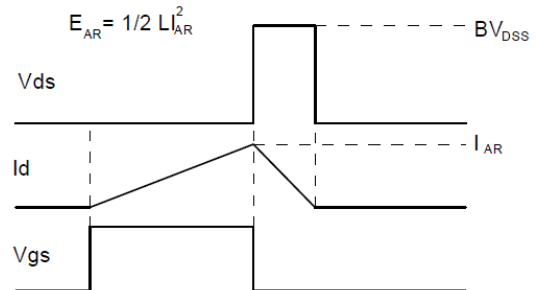
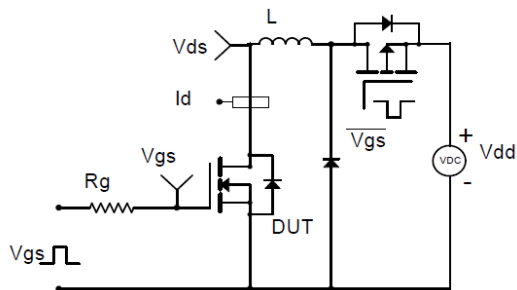
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

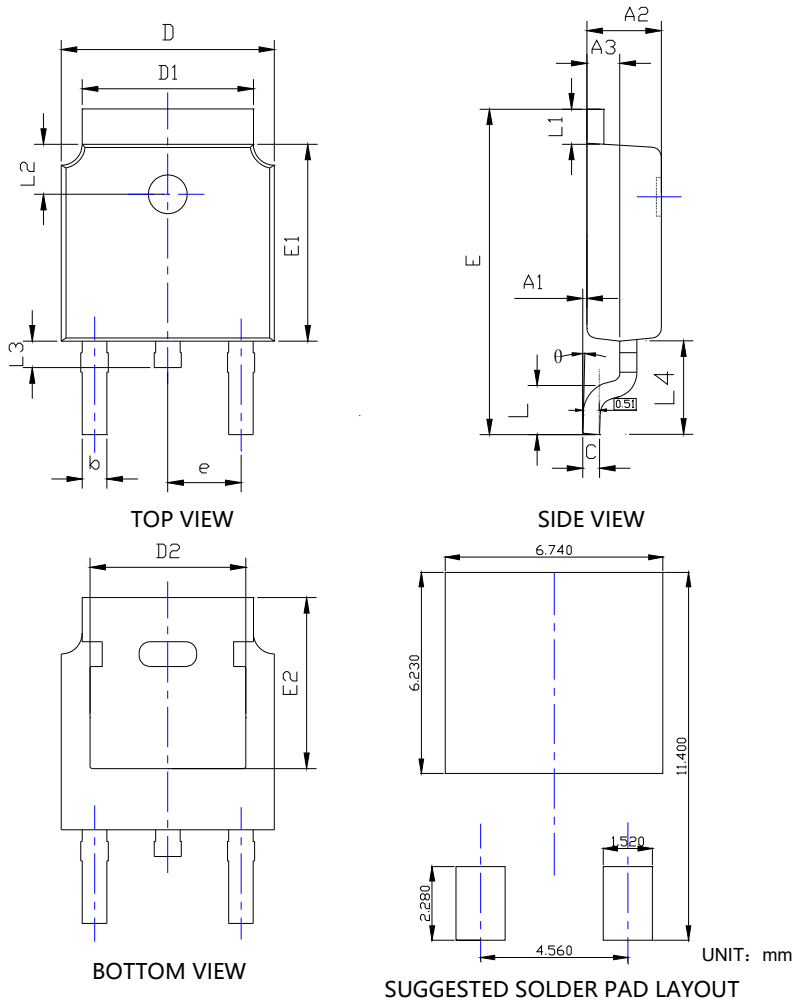


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



YJD30N02A

■ TO-252-B Package information



SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A1	0.000	---	0.008	0.000	---	0.200
A2	0.087	0.091	0.094	2.200	2.300	2.400
A3	0.035	0.039	0.043	0.900	1.000	1.100
b	0.026	0.030	0.034	0.660	0.760	0.860
c	0.018	0.020	0.023	0.460	0.520	0.580
D	0.256	0.260	0.264	6.500	6.600	6.700
D1	0.203	0.209	0.215	5.150	5.300	5.450
D2	0.181	0.189	0.195	4.600	4.800	4.950
E	0.390	0.398	0.406	9.900	10.100	10.300
E1	0.236	0.240	0.244	6.000	6.100	6.200
E2	0.203	0.209	0.215	5.150	5.300	5.450
e	0.090BSC			2.286BSC		
L	0.049	0.059	0.069	1.250	1.500	1.750
L1	0.035	---	0.050	0.900	---	1.270
L2	0.055	---	0.075	1.400	---	1.900
L3	0.240	0.310	0.039	0.600	0.800	1.000
L4	0.114REF			2.900REF		
θ	0°	---	10°	0°	---	10°

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.



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