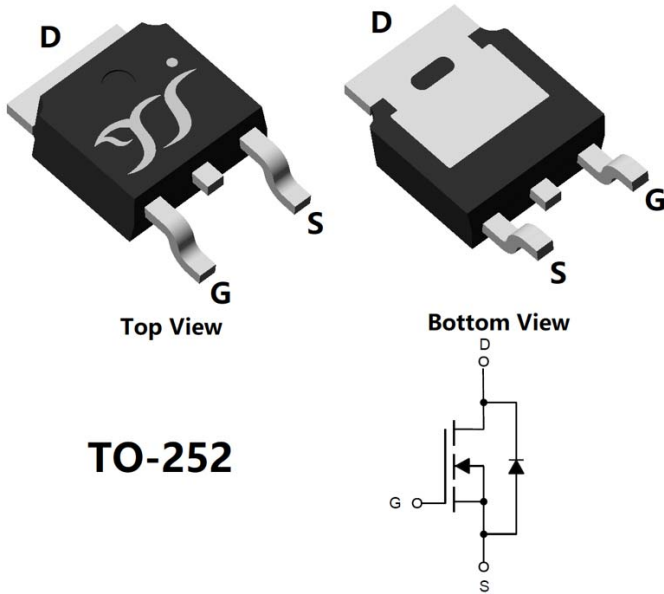


N-Channel Enhancement Mode Field Effect Transistor



TO-252

Product Summary

- V_{DS} 100V
- I_D 25A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) < 52mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 56mohm
- 100% EAS Tested
- 100% ∇V_{DS} 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

- DC-DC Converters
- Power management functions
- Backlighting

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

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	100	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current	I_D	$T_C=25^\circ\text{C}$	25
		$T_C=100^\circ\text{C}$	16
Pulsed Drain Current ^A	I_{DM}	100	A
Total Power Dissipation	P_D	$T_C=25^\circ\text{C}$	45
		$T_C=100^\circ\text{C}$	18
Single Pulse Avalanche Energy ^B	E_{AS}	9.9	mJ
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	2.78	$^\circ\text{C}/\text{W}$
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
YJD25N10A	F1/F2	YJD25N10A	2500	/	25000	13" reel



YJD25N10A

■ Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	$T_J=25^\circ\text{C}$		1	μA
			$T_J=150^\circ\text{C}$		100	
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.1	1.8	3.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$		43	52	m Ω
		$V_{GS}=4.5V, I_D=8A$		46	56	
Diode Forward Voltage	V_{SD}	$I_S=25A, V_{GS}=0V$		0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S				25	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1\text{MHz}$		2071		pF
Output Capacitance	C_{oss}			73		
Reverse Transfer Capacitance	C_{rss}			54		
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=50V, I_D=10A$		51.4		nC
Gate-Source Charge	Q_{gs}			9.1		
Gate-Drain Charge	Q_{gd}			11.5		
Reverse Recovery Charge	Q_{rr}	$I_F=10A, di/dt=100A/\mu s$		35.3		ns
Reverse Recovery Time	t_{rr}			38		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=50V, I_D=2A$ $R_{GEN}=3\Omega$		10		ns
Turn-on Rise Time	t_r			19		
Turn-off Delay Time	$t_{D(off)}$			42		
Turn-off fall Time	t_f			26		

A. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

B. $T_J=25^\circ\text{C}$, $V_{DD}=50V$, $V_G=10V$, $L=0.5\text{mH}$, $I_{AS}=6.3A$

C. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the soldermounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.



■ Typical Performance Characteristics

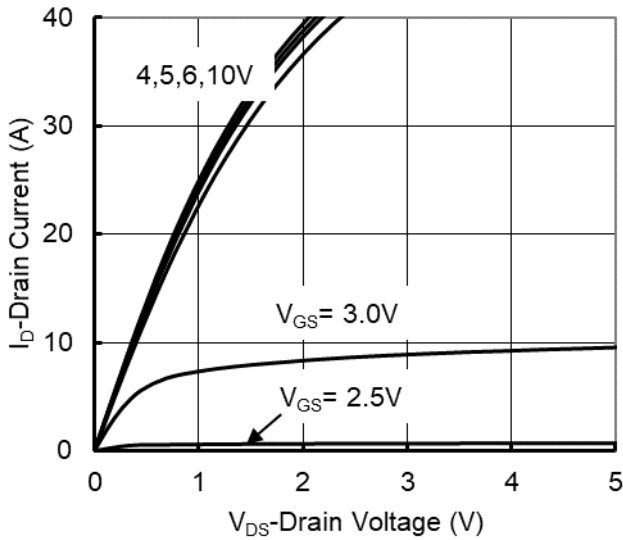


Figure 1. Output Characteristics

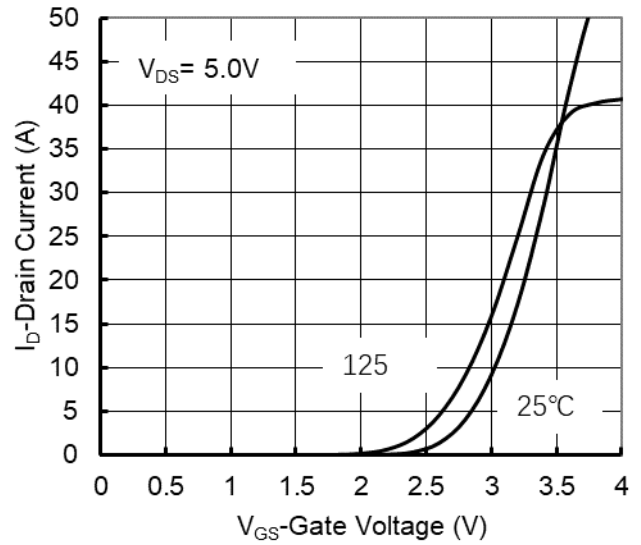


Figure 2. Transfer Characteristics

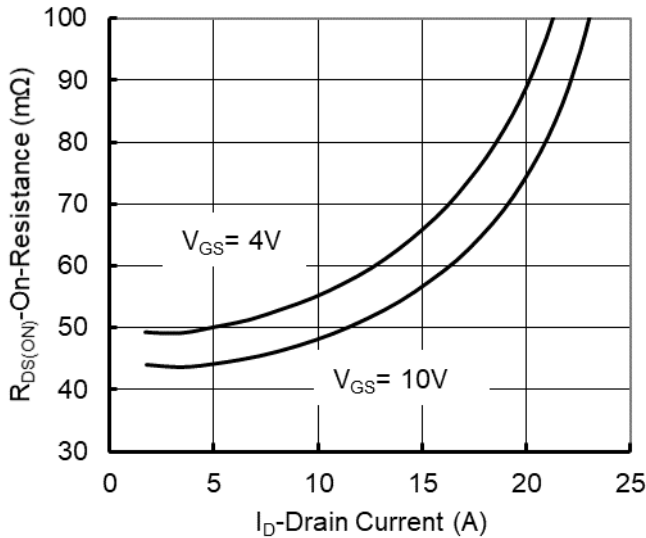


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

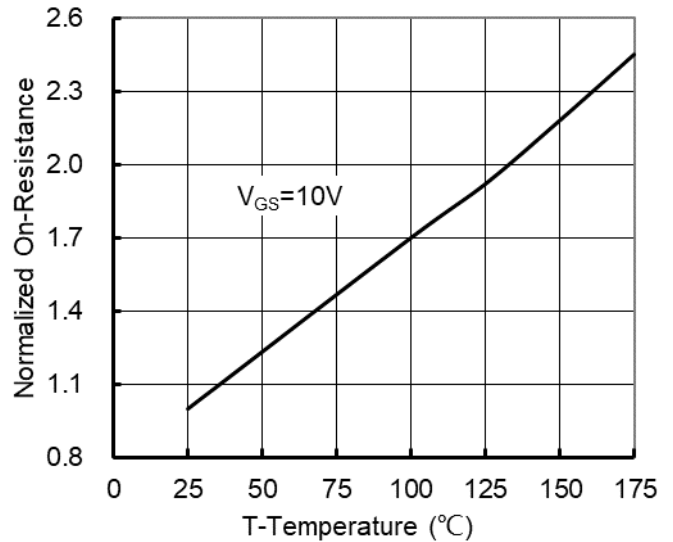


Figure 4. On-Resistance vs. Junction Temperature

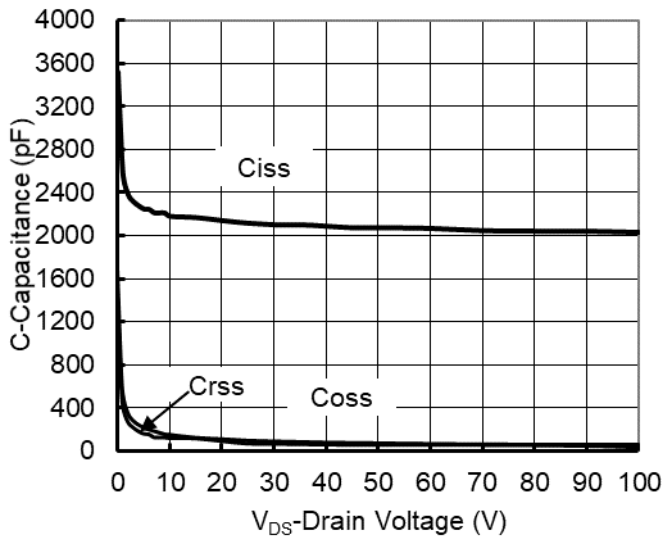


Figure 5. Capacitance Characteristics

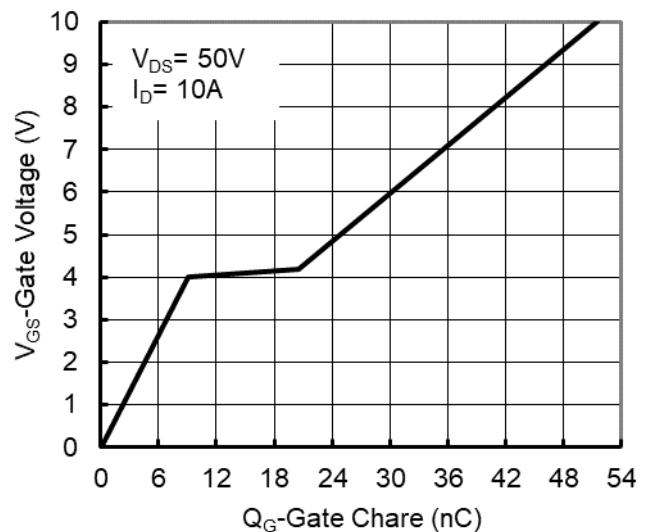


Figure 6. Gate Charge



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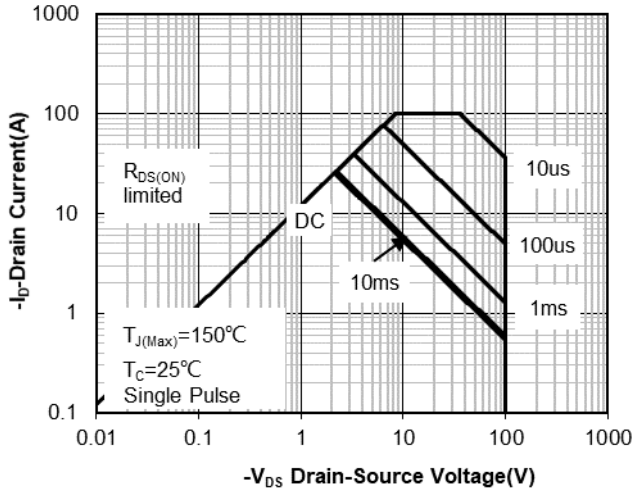


Figure 7. Safe Operation Area

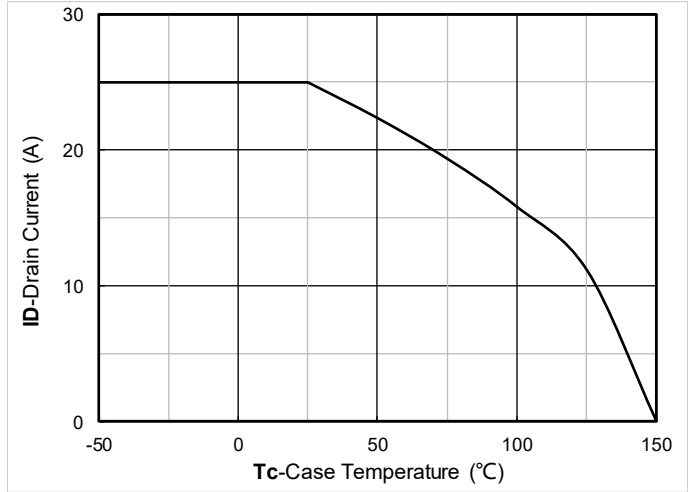


Figure 8. Maximum Continuous Drain Current vs Case Temperature

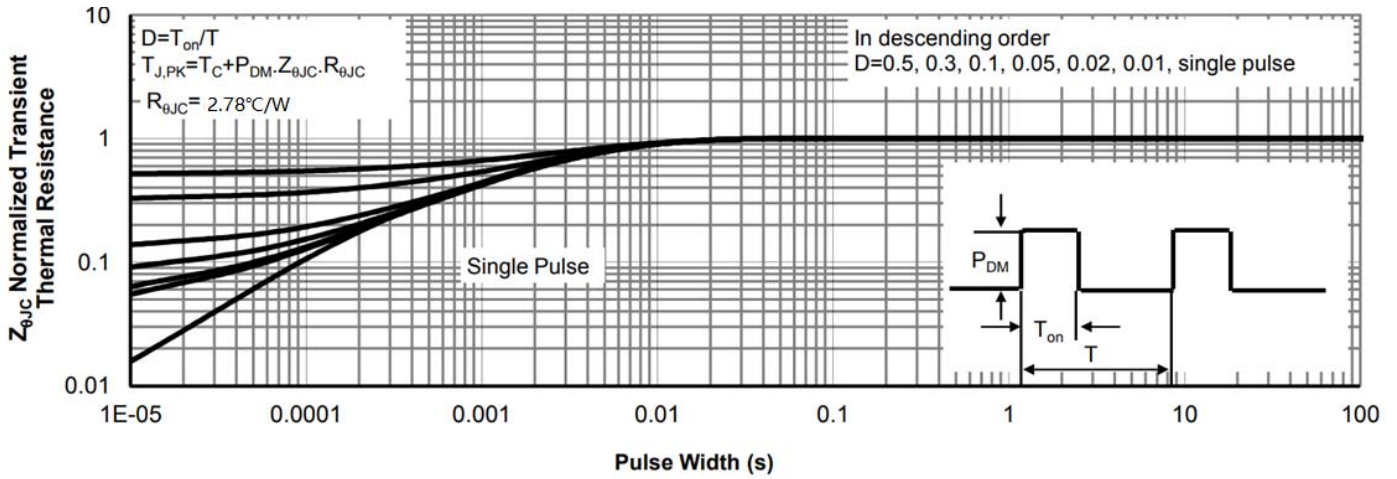
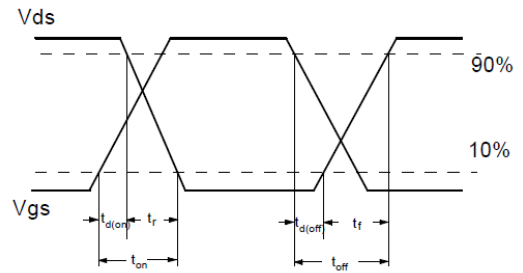
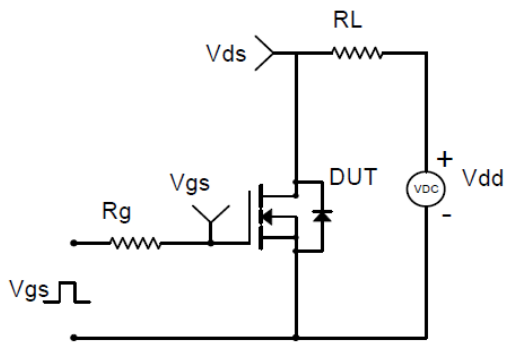
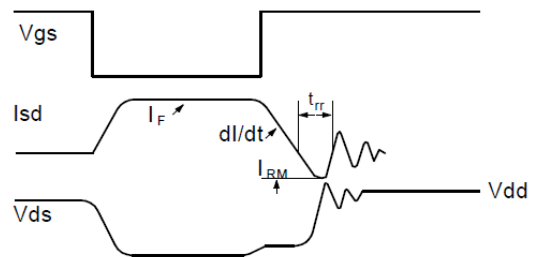
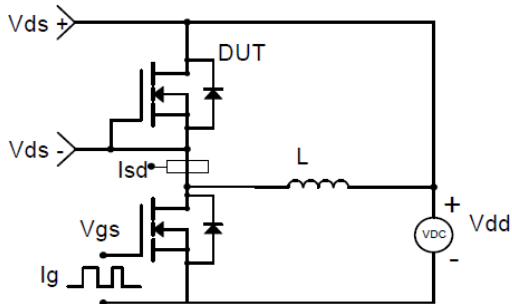


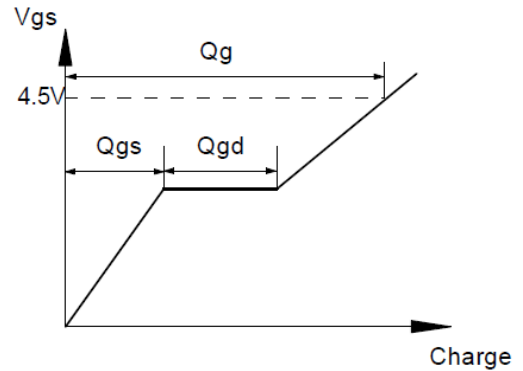
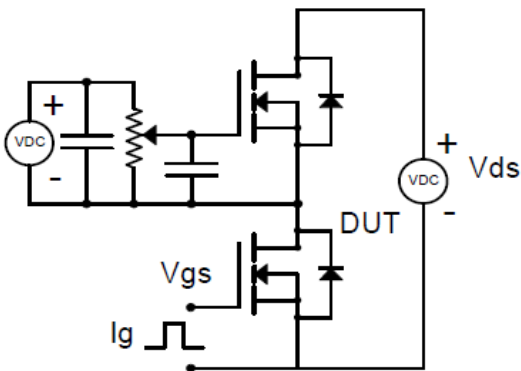
Figure 9. Normalized Maximum Transient Thermal Impedance



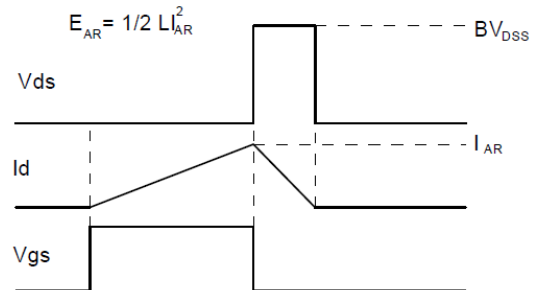
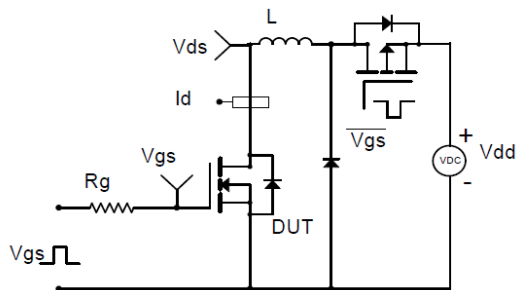
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

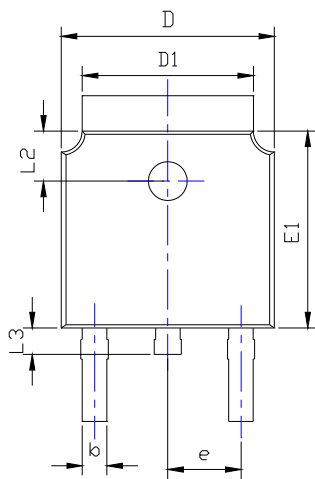


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

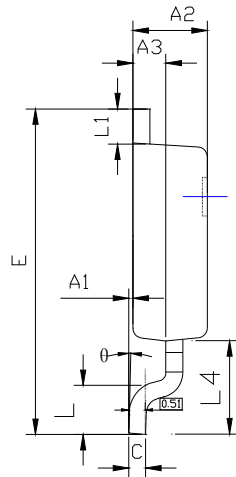


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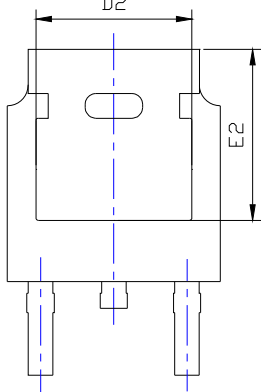
■ TO-252-B Package information



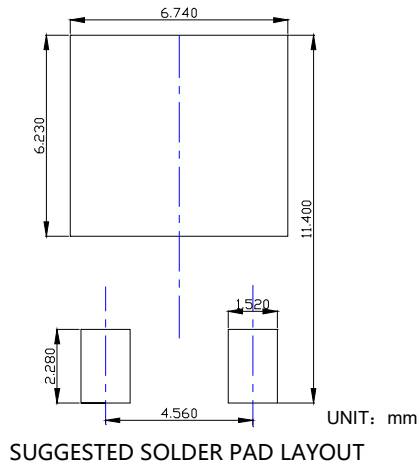
TOP VIEW



SIDE VIEW



BOTTOM VIEW



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.



YJD25N10A

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