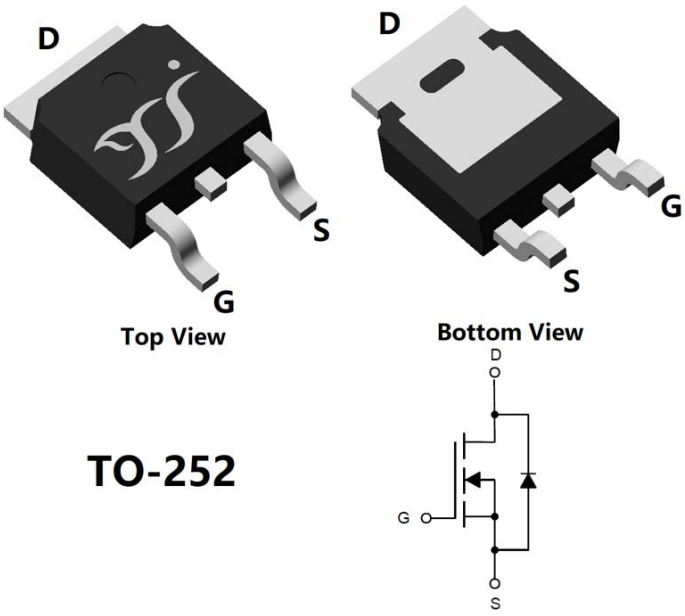
N-Channel Enhancement Mode Field Effect Transistor



Product Summary

- V_{DS} 20V
- I_D 60A
- $R_{DS(ON)}$(at V_{GS}=4.5V) 6.0mohm
- $R_{DS(ON)}$(at V_{GS}=2.5V) 8.8mohm
- $R_{DS(ON)}$(at V_{GS}=1.8V) 14mohm
- 100% EAS Tested
- 100% ▽VDS Tested

General Description

- Trench Power LV 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 switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

■ Absolute Maximum Ratings (T_A=25 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	I_D	60	A
	T_C=100		38	
Pulsed Drain Current [A]		I_{DM}	210	A
Total Power Dissipation	T_C=25	P_D	29	W
	T_C=100		11	W
Single Pulse Avalanche Energy [B]		E_{AS}	68	mJ
Thermal Resistance Junction-to-Case [C]		$R_{\theta JC}$	4.3	/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55 +150	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJD60N02A	F1/F2	YJD60N02A	2500	/	25000	13“ reel

■ 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_{GSS}	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=20A		4.5	6.0	mΩ
		V_{GS}= 2.5V, I_D=15A		5.5	8.8	
		V_{GS}= 1.8V, I_D=10A		8.0	14	
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V			1.2	V
Maximum Body-Diode Continuous Current	I_S				60	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}= 0V,f= 1MHZ		2250		pF
Output Capacitance	C_{oss}			334		
Reverse Transfer Capacitance	C_{rss}			271		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}= 4.5V,V_{DS}= 10V,I_D= 15A		27.9		nC
Gate-Source Charge	Q_{gs}			4.1		
Gate-Drain Charge	Q_{gd}			7.4		
Reverse Recovery Charge	Q_{rr}	I_F= 15A, di/dt= 100A/us		2.2		
Reverse Recovery Time	t_{rr}			16.3		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}= 4.5V,V_{DD}= 10V, I_D= 10A,R_L= 1Ω R_{GEN}= 3Ω		13		
Turn-on Rise Time	t_r			53		
Turn-off Delay Time	$t_{D(off)}$			61		
Turn-off fall Time	t_f			76		

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

B. T_j=25 , V_{DD}=18V, V_G=5V, L=0.5mH, R_g

■ Typical Performance Characteristics

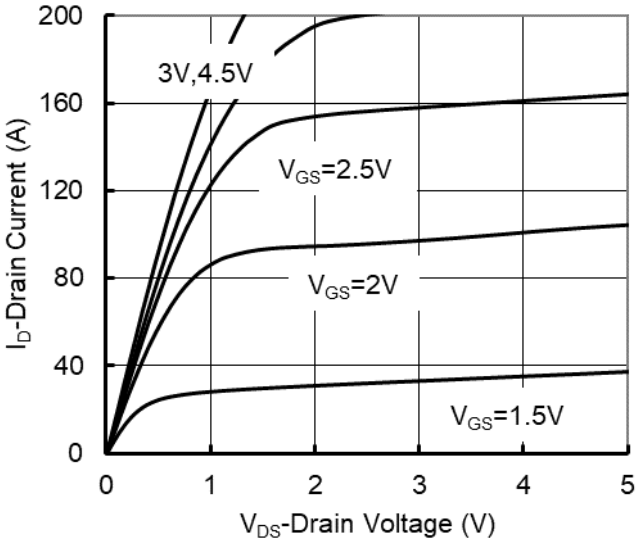


Figure1. Output Characteristics

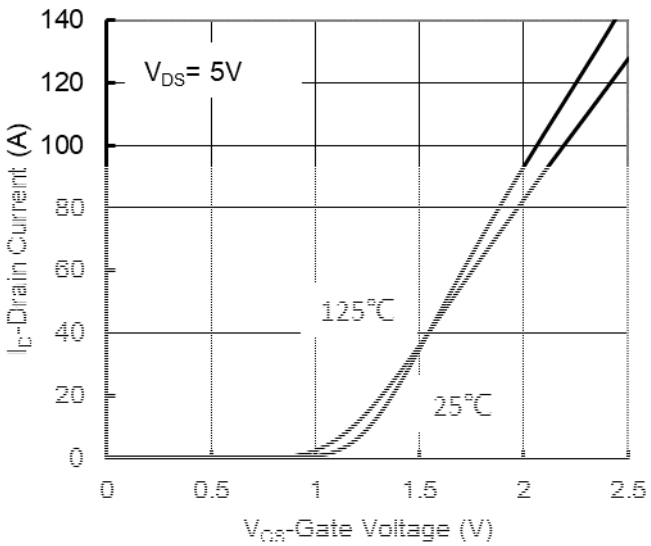


Figure2. Transfer Characteristics

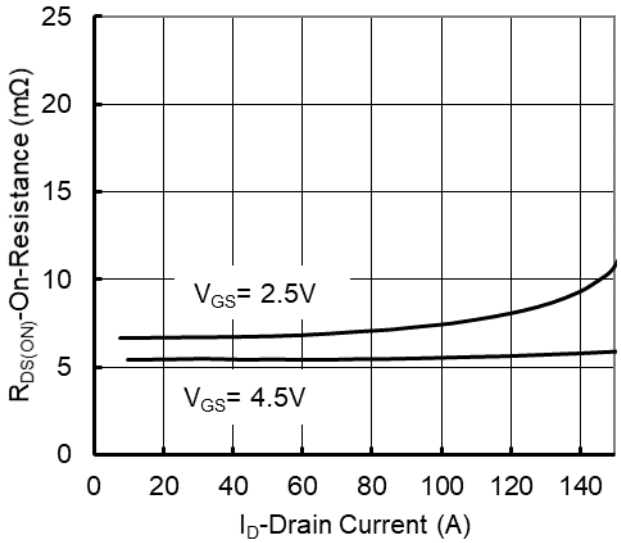


Figure3. On-Resistance vs. Drain Current

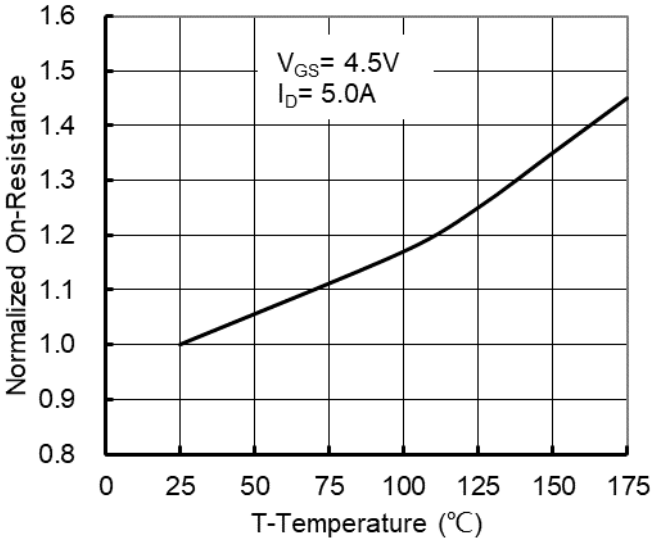


Figure4. Gate Charge

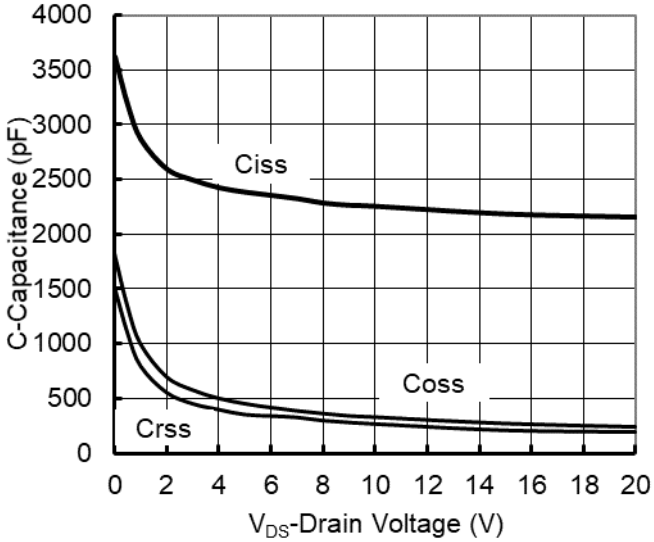


Figure5.Capacitance Characteristics

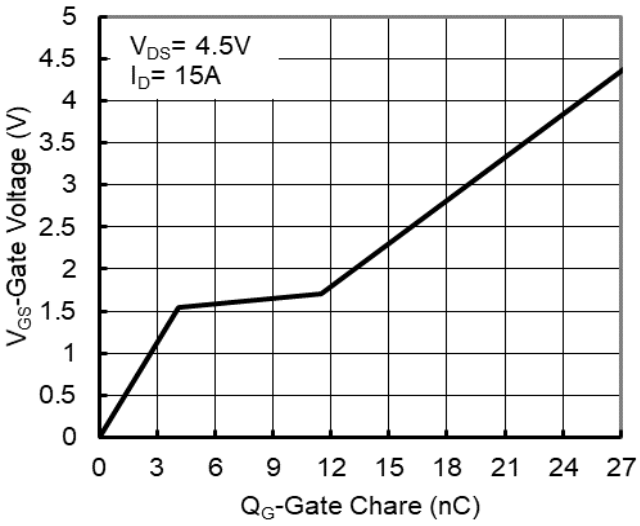


Figure6. Gate Charge

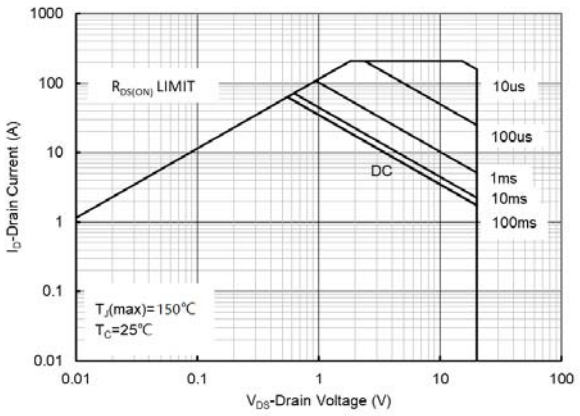


Figure7. Safe Operation Area

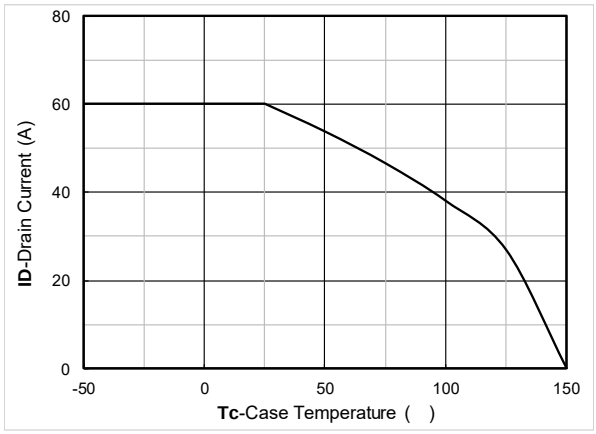


Figure8. Maximum Continuous Drain Current vs. Case Temperature

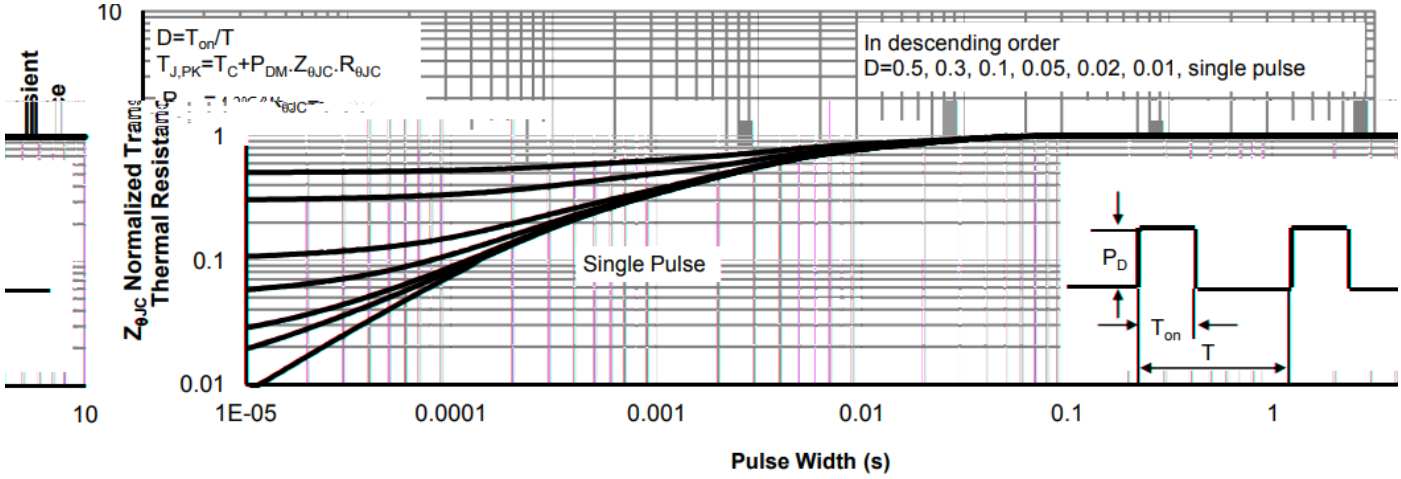
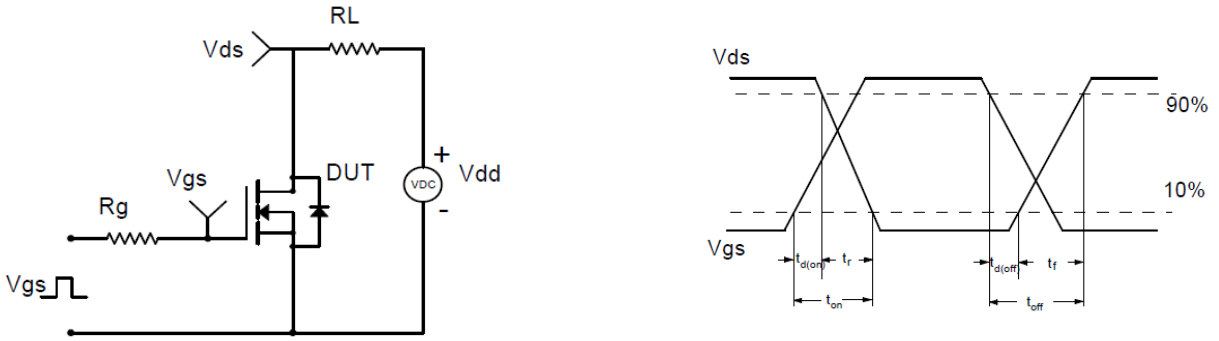
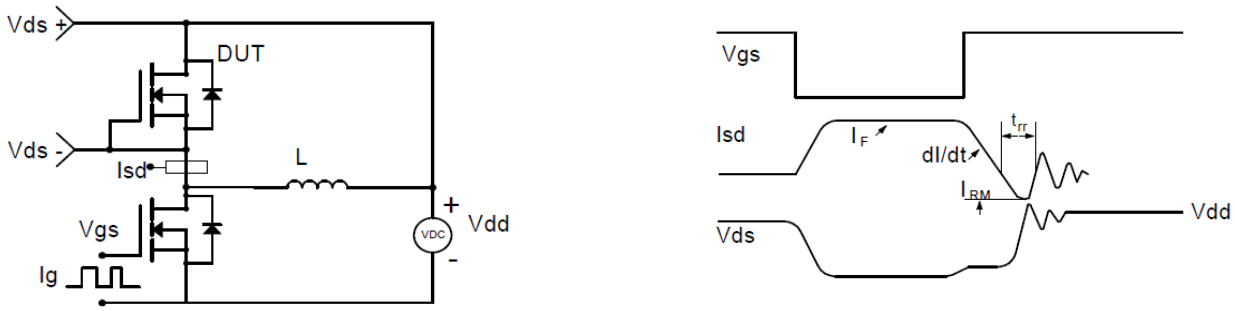


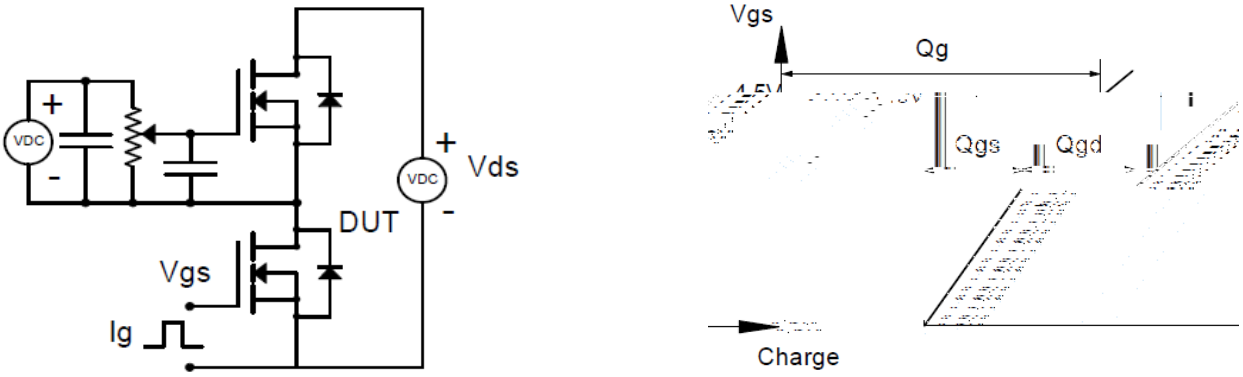
Figure9. Normalized Maximum Transient Thermal Impedance



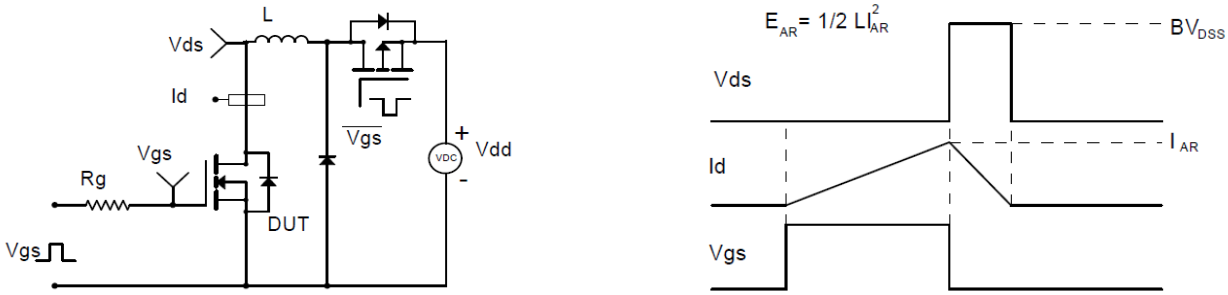
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

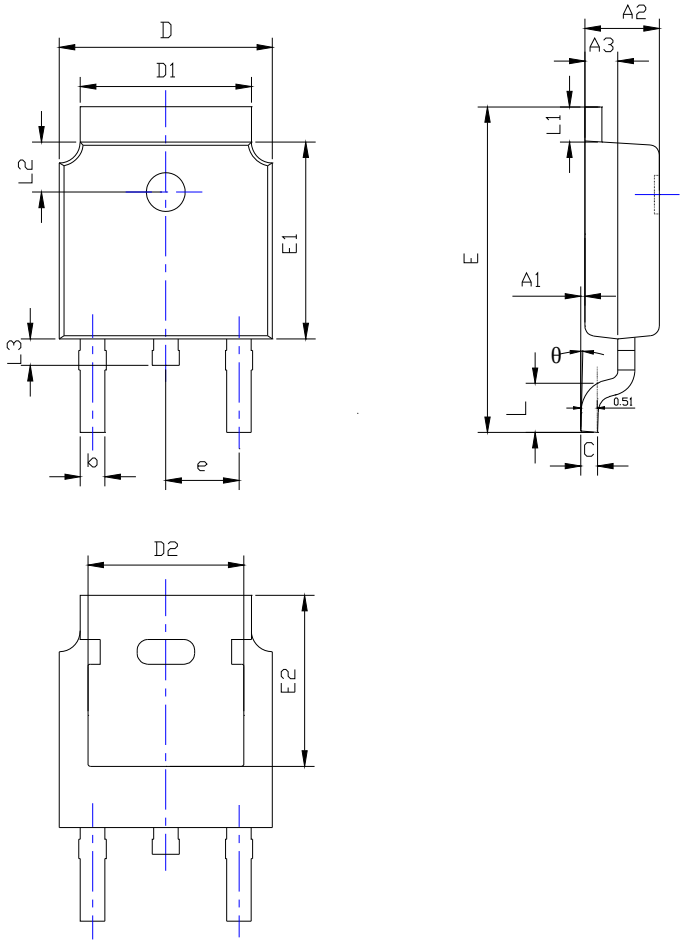


Gate Charge Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

■ 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		2.400
A3	0.035	0.039	0.043	0.900		1.100
b	0.026	0.030	0.034	0.660		0.860
c	0.018	0.020	0.023	0.460		0.580
D	0.256	0.260	0.264	6.500		6.700
D1						
D2	0.181	0.189	0.195	4.600		4.950
E	0.390	0.398	0.406	9.900		10.300
E1	0.236	0.240	0.244	6.000		6.200
e	0.090BSC			2.286BSC		
L	0.049	0.059	0.06	1.250		1.750
L1						
L2	0.055		0.075	1.400		1.900
L3	0.240	0.310	0.039	0.600		1.000
L4	0.114REF					
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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