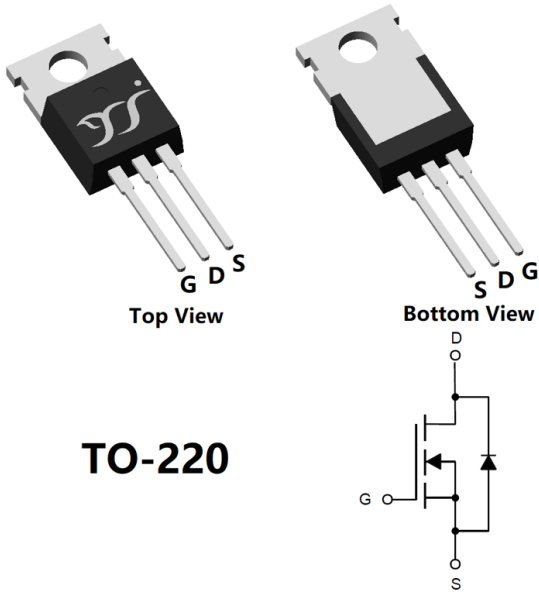


## N-Channel Enhancement Mode Field Effect Transistor



**TO-220**

### Product Summary

- $V_{DS}$  100V
- $I_D$  130A
- $R_{DS(ON)}$  (at  $V_{GS}=10V$ ) < 5.5mohm
- 100% UIS Tested
- 100%  $\nabla V_{DS}$  Tested

### General Description

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$

### Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		$V_{DS}$	100	V
Gate-source Voltage		$V_{GS}$	$\pm 20$	V
Drain Current	$T_C=25^\circ C$	$I_D$	130	A
	$T_C=100^\circ C$		82	
Pulsed Drain Current <sup>A</sup>		$I_{DM}$	520	A
Avalanche energy <sup>B</sup>		EAS	552	mJ
Total Power Dissipation <sup>C</sup>	$T_C=25^\circ C$	$P_D$	310	W
	$T_C=100^\circ C$		125	
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~+150	$^\circ C$

### ■ Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient <sup>D</sup>	Steady-State	$R_{\theta JA}$	30	40	$^\circ C/W$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	0.35	0.4	

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJP130G10B	B1	YJP130G10B	50	/	5000	Tube



# YJP130G10B

## ■ Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	100	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V	-	-	1	μA
		V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, T <sub>J</sub> =150°C	-	-	100	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	2	2.8	4	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =65A	-	4.5	5.5	mΩ
		V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	4.5	5.5	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =65A, V <sub>GS</sub> =0V	-	0.9	1.2	V
Gate resistance	R <sub>G</sub>	f=1MHz, Open drain	-	0.8	-	Ω
Maximum Body-Diode Continuous Current	I <sub>S</sub>		-	-	130	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz	-	4500	-	pF
Output Capacitance	C <sub>oss</sub>		-	1700	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	25	-	
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =65A	-	62	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	16	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	14	-	
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =65A, di/dt=600A/us	-	175	-	nC
Reverse Recovery Time	t <sub>rr</sub>		-	38	-	ns
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =50V, I <sub>D</sub> =65A R <sub>GEN</sub> =2.2Ω	-	20	-	ns
Turn-on Rise Time	t <sub>r</sub>		-	82	-	
Turn-off Delay Time	t <sub>D(off)</sub>		-	30	-	
Turn-off fall Time	t <sub>f</sub>		-	7	-	

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

B. T<sub>J</sub>=25°C, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=2mH, I<sub>AS</sub>=23.5A.

C. P<sub>d</sub> is based on max. junction temperature, using junction-case thermal resistance.

D. The value of R<sub>θJA</sub> is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub> =25°C. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.



# YJP130G10B

## Typical Electrical and Thermal Characteristics Diagrams

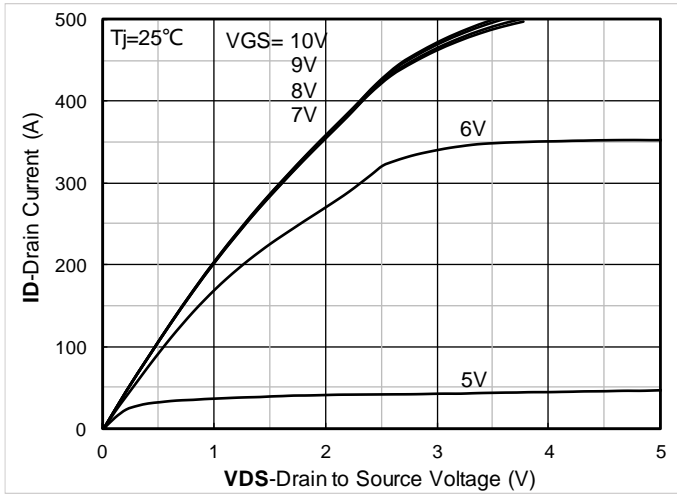


Figure1. Output Characteristics

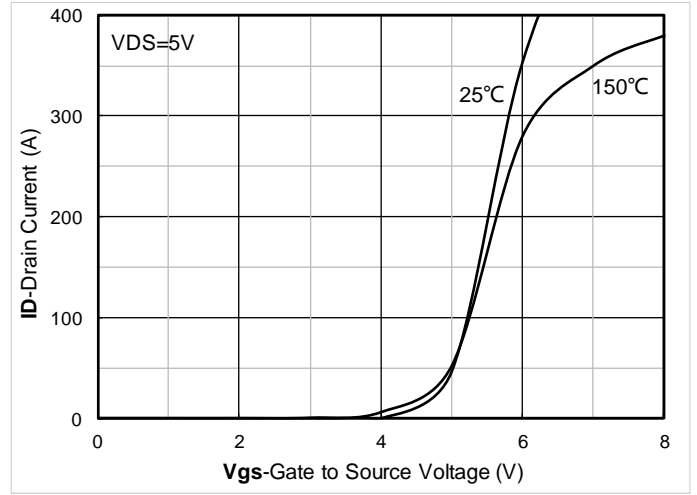


Figure2. Transfer Characteristics

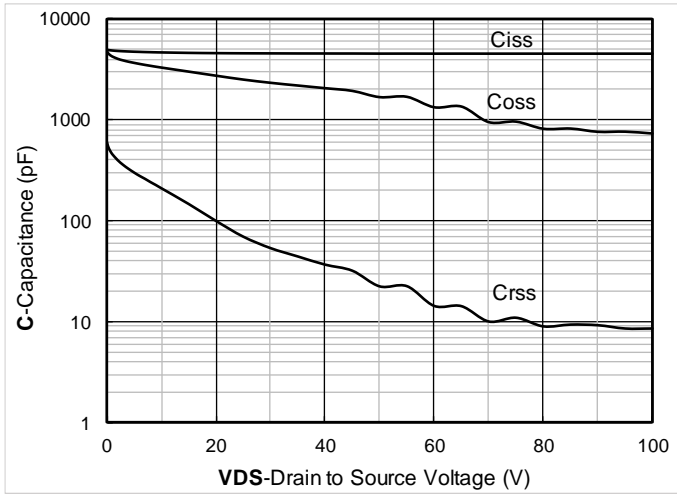


Figure3. Capacitance Characteristics

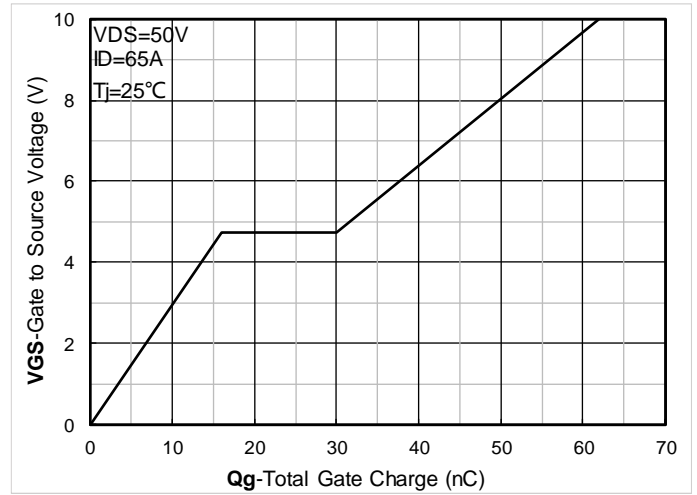


Figure4. Gate Charge

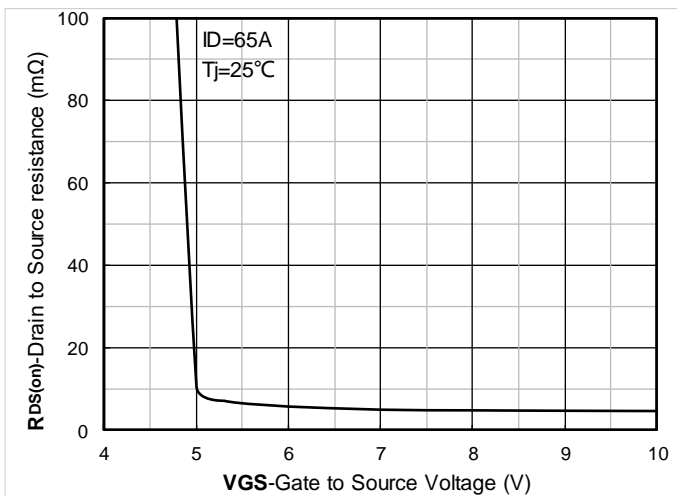


Figure5. On-Resistance vs Gate to Source Voltage

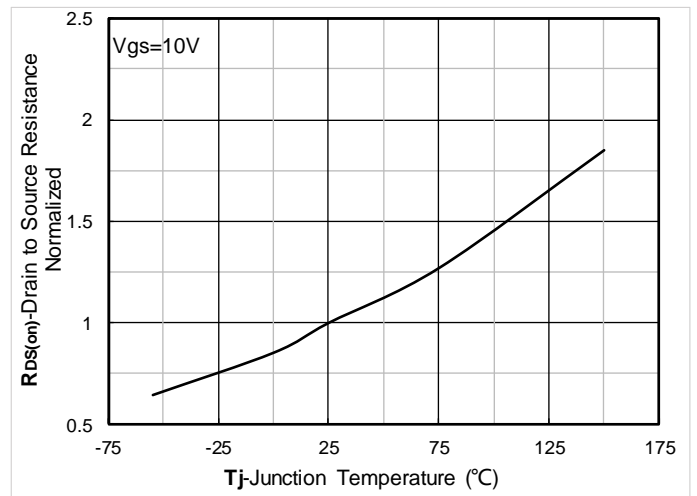


Figure6. Normalized On-Resistance



# YJP130G10B

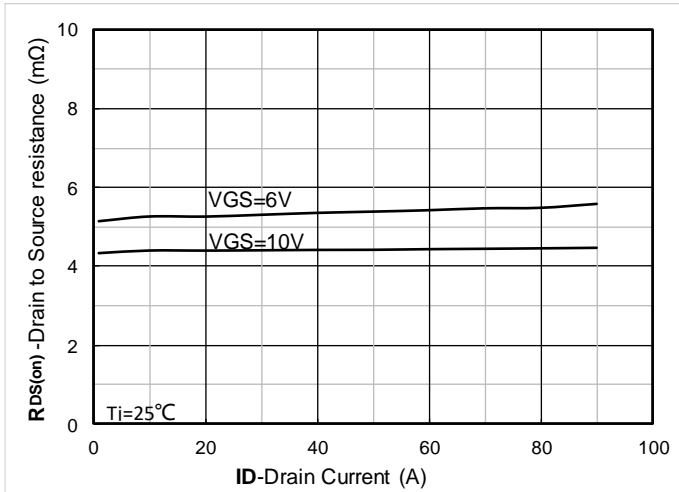


Figure7. RDS(on) VS Drain Current

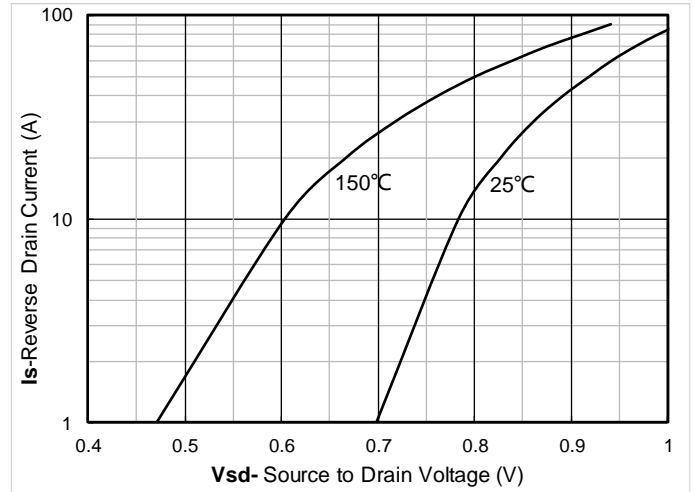


Figure8. Forward characteristics of reverse diode

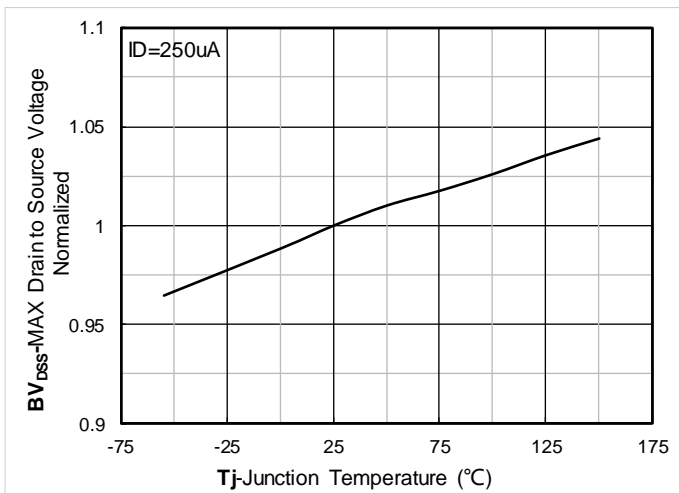


Figure9. Normalized breakdown voltage

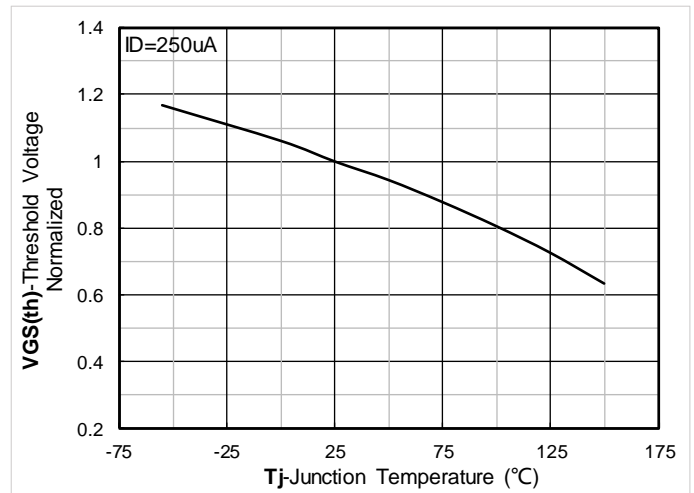


Figure10. Normalized Threshold voltage

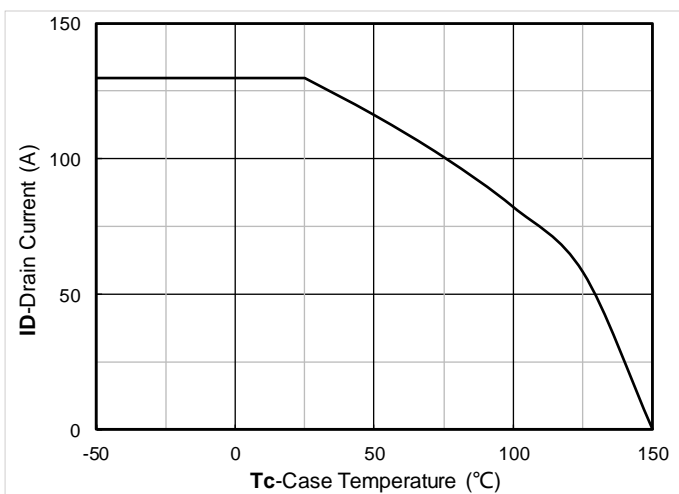


Figure11. Current dissipation

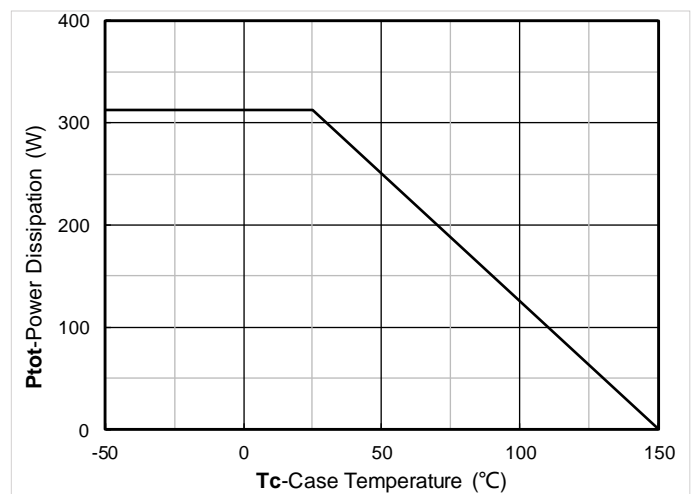


Figure12. Power dissipation



# YJP130G10B

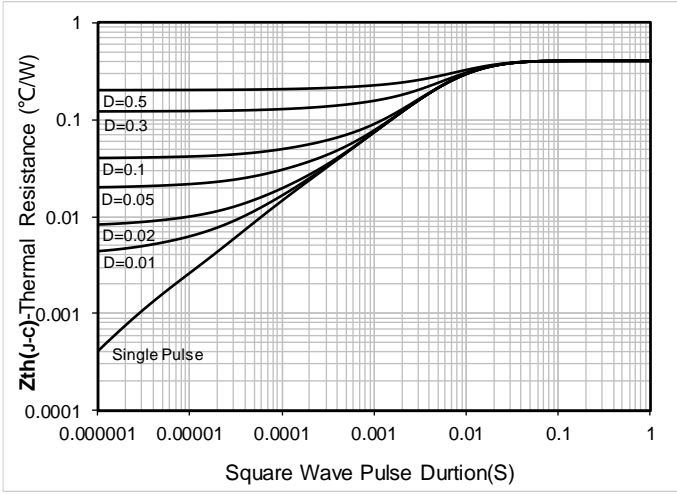


Figure13. Maximum Transient Thermal Impedance

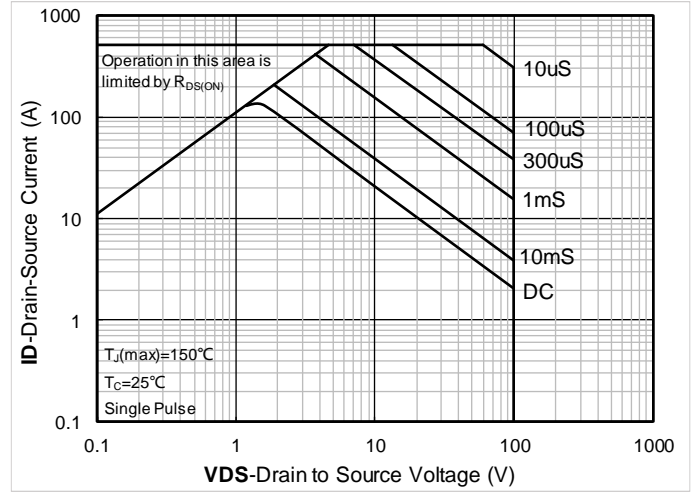
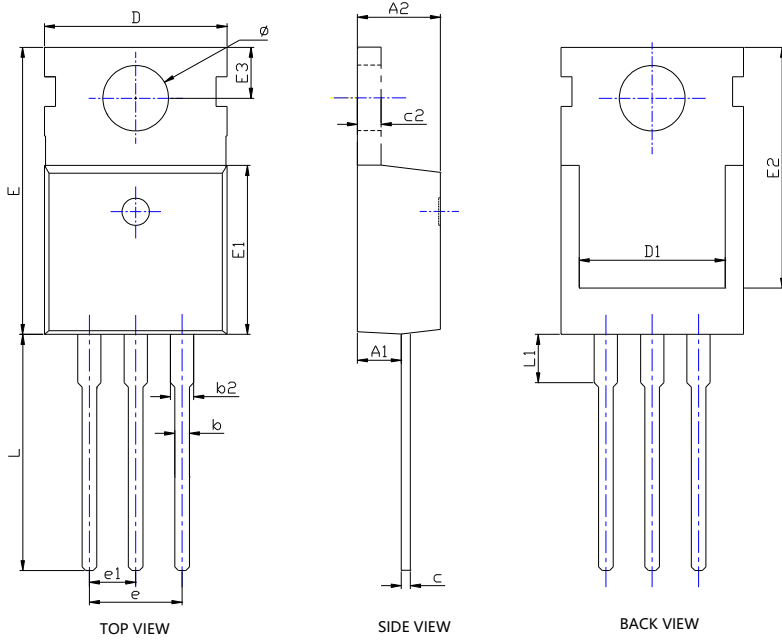


Figure14. Safe Operation Area



# YJP130G10B

## ■ TO-220AB-D Package information



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A1	0.091	0.098	2.300	2.500
A2	0.175	0.183	4.450	4.650
b	0.030	0.033	0.750	0.850
b2	0.048	0.052	1.220	1.320
c	0.018	0.022	0.450	0.550
c2	0.050	0.052	1.270	1.330
D	0.386	0.402	9.800	10.200
D1	0.303	0.327	7.700	8.300
E	0.614	0.630	15.600	16.000
E1	0.360	0.372	9.150	9.450
E2	0.510	0.533	12.950	13.550
E3	0.110BSC		2.800BSC	
e	0.200BSC		5.080BSC	
e1	0.100BSC		2.540BSC	
L	0.506	0.518	12.850	13.150
L1	0.093	0.117	2.360	2.960
φ	0.138	0.146	3.500	3.700

NOTE:  
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.  
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.



## YJP130G10B

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