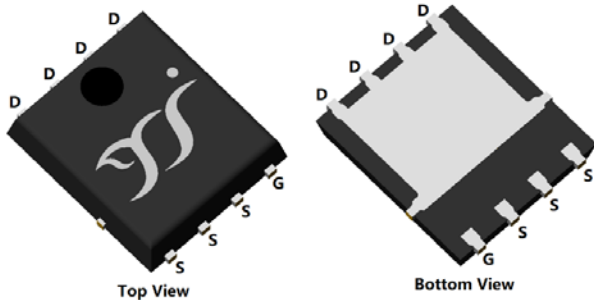
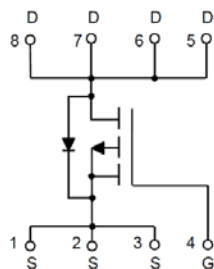


## P-Channel Enhancement Mode Field Effect Transistor



PDFN5060-8L



### Product Summary

- $V_{DS}$  -60 V
- $I_D$  -80 A
- $R_{DS(ON)}$  (at  $V_{GS}=-10V$ ) <math>< 8.5m\Omega</math>
- 100% UIS Tested
- 100%  $\nabla V_{DS}$  Tested

### General Description

- Split gate trench MOSFET technology
- Low  $R_{DS(on)}$  & FOM
- Excellent stability and uniformity
- Moisture Sensitivity Level 3
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free
- Part no. with suffix "Q" means AEC-Q101 qualified

### Applications

- Power management
- Portable equipment
- 12 and 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		$V_{GS}$	$\pm 18$	V
Drain Current	$T_A=25^\circ C$	$I_D$	-12	A
	$T_A=100^\circ C$		-7.5	
	$T_C=25^\circ C$		-80	
	$T_C=100^\circ C$		-50	
Pulsed Drain Current <sup>A</sup>		$I_{DM}$	-320	A
Avalanche energy <sup>B</sup>		EAS	400	mJ
Total Power Dissipation <sup>C</sup>	$T_A=25^\circ C$	$P_D$	2.5	W
	$T_A=100^\circ C$		1	
	$T_C=25^\circ C$		120	
	$T_C=100^\circ C$		48	
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	$R_{\theta JA}$	40	50	$^\circ C/W$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	0.8	1.04	



# YJG80GP06BQ

## ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJG80GP06BQ	F1	YJG80GP06B	5000	10000	100000	13" reel

## ■ 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	-60	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V	-	-	-1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±18V, 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	-2.7	-4	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A	-	6.1	8.5	mΩ
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-20A, V <sub>GS</sub> =0V	-	-0.9	-1.3	V
Gate resistance	R <sub>G</sub>	f=1MHz, Open drain	-	10	-	Ω
Maximum Body-Diode Continuous Current	I <sub>S</sub>		-	-	-80	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, f=1MHz	-	5500	-	pF
Output Capacitance	C <sub>oss</sub>		-	1555	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	220	-	
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V, I <sub>D</sub> =-20A	-	80.7	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	19	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	18.3	-	
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =-20A, di/dt=100A/us	-	84	-	nC
Reverse Recovery Time	t <sub>rr</sub>		-	57.5	-	ns
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =-10V, V <sub>DD</sub> =-30V, R <sub>GEN</sub> =1.6Ω, I <sub>D</sub> =-20A	-	13.2	-	ns
Turn-on Rise Time	t <sub>r</sub>		-	27.7	-	
Turn-off Delay Time	t <sub>D(off)</sub>		-	137.8	-	
Turn-off fall Time	t <sub>f</sub>		-	59.5	-	

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

B. T<sub>J</sub>=25°C, V<sub>DD</sub>=-40V, V<sub>GS</sub>=-10V, L=2mH, I<sub>AS</sub>=-20A.

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

D. The value of R<sub>θJA</sub> is measured with the device mounted on the 40mm\*40mm\*1.1mm FR-4 PCB board with 1 in2 pad of 2oz. Copper, in the still air environment with TA =25°C. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.



# YJG80GP06BQ

## Typical Electrical and Thermal Characteristics Diagrams

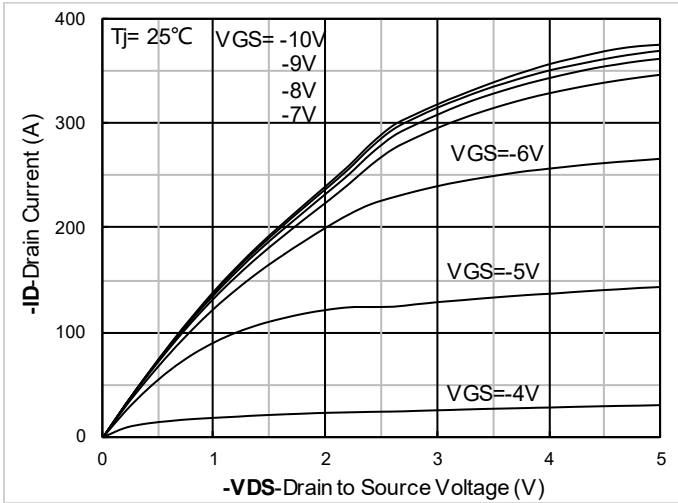


Figure 1. Output Characteristics

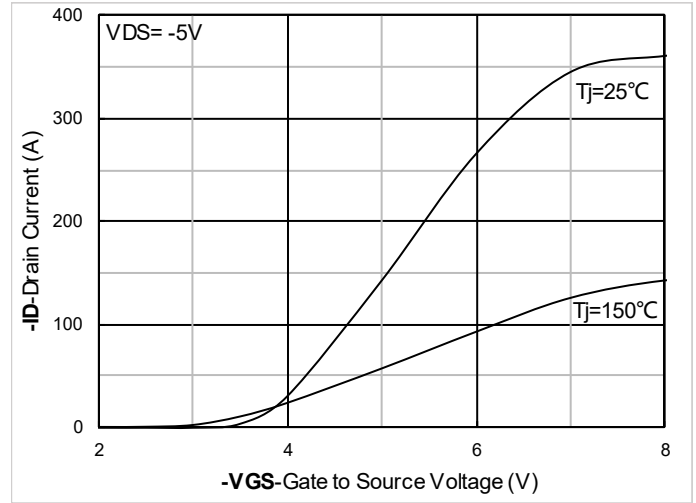


Figure 2. Transfer Characteristics

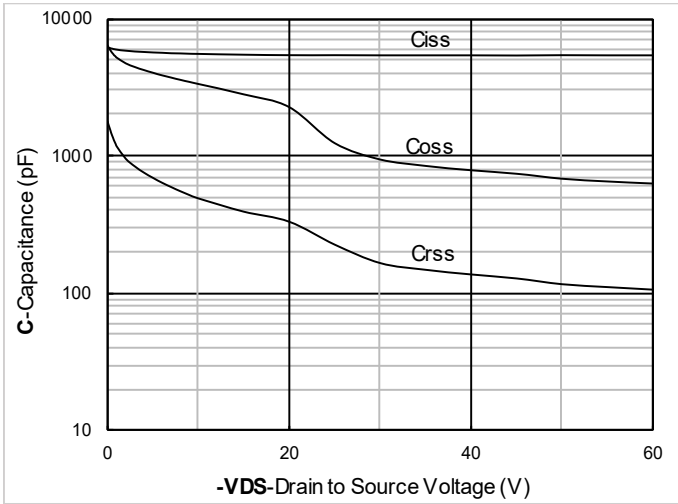


Figure 3. Capacitance Characteristics

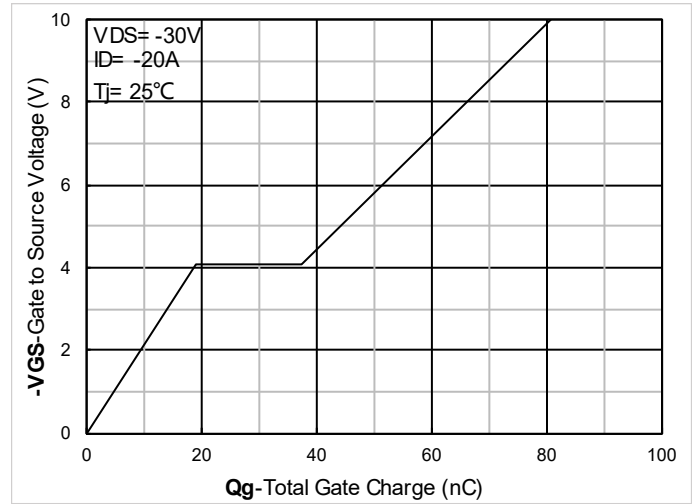


Figure 4. Gate Charge

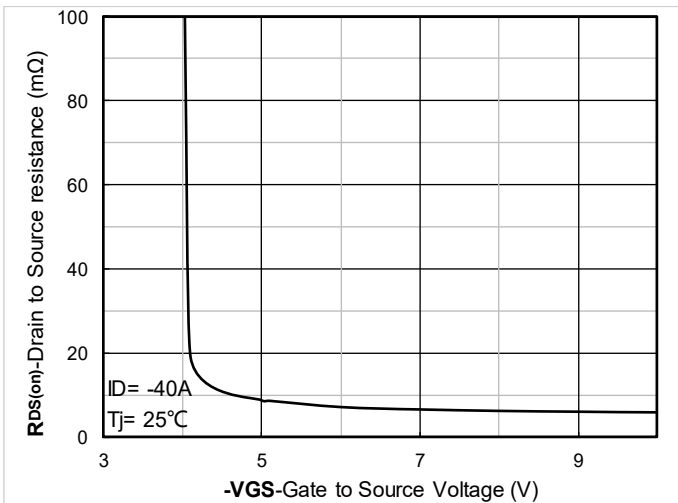


Figure 5. On-Resistance vs Gate to Source Voltage

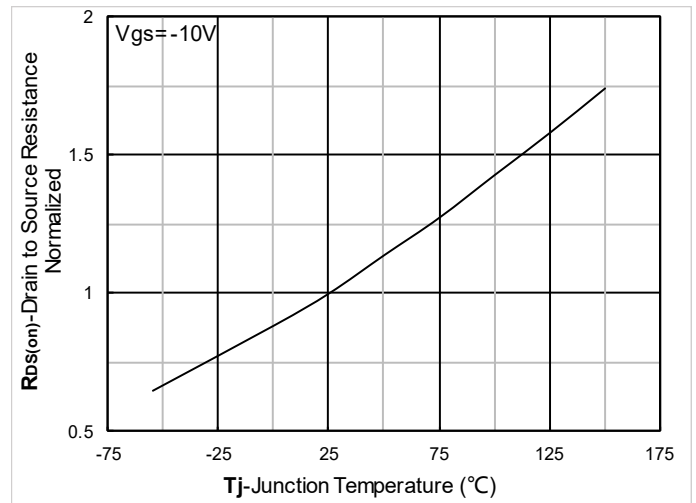


Figure 6. Normalized On-Resistance



# YJG80GP06BQ

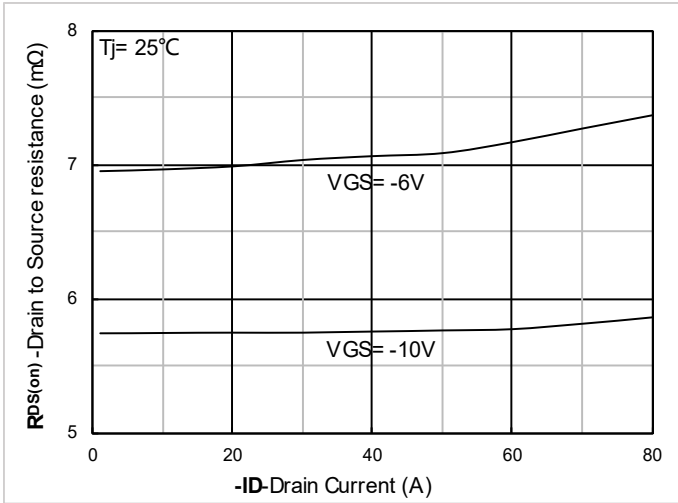


Figure 7.  $R_{DS(on)}$  VS Drain Current

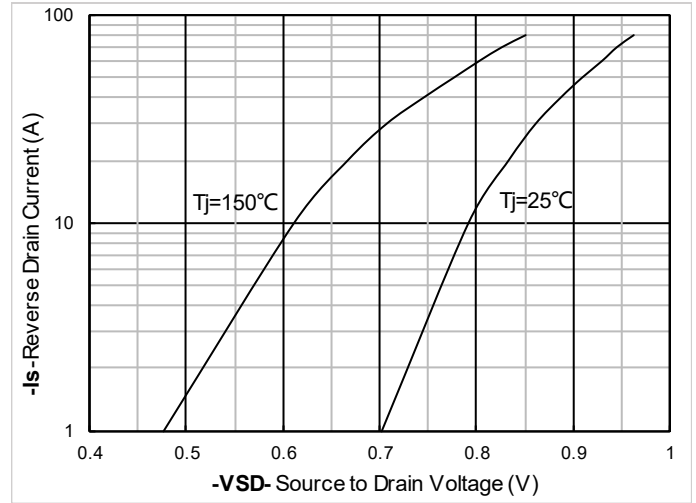


Figure 8. Forward characteristics of reverse diode

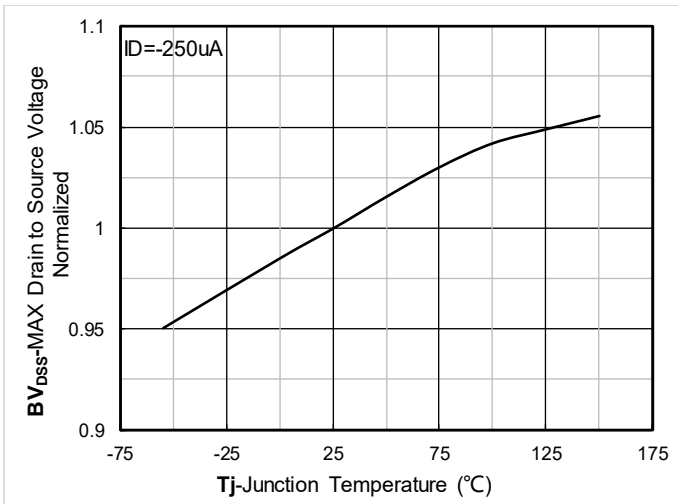


Figure 9. Normalized breakdown voltage

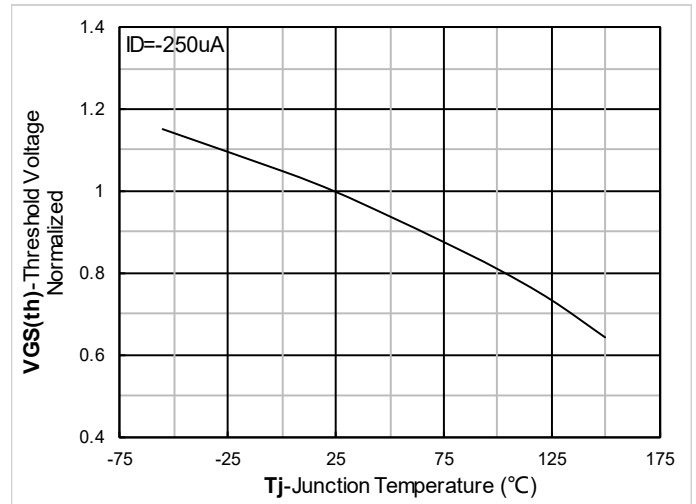


Figure 10. Normalized Threshold voltage

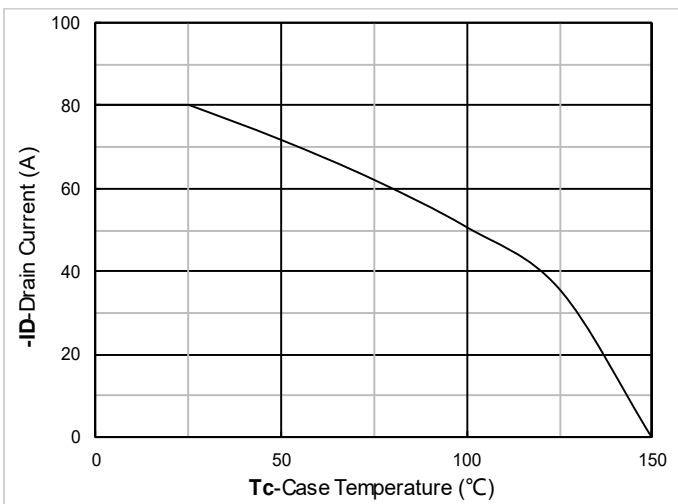


Figure 11. Current dissipation

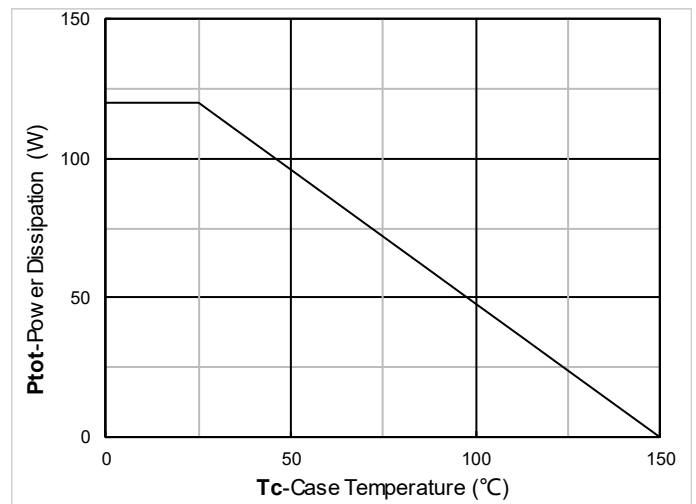


Figure 12. Power dissipation



# YJG80GP06BQ

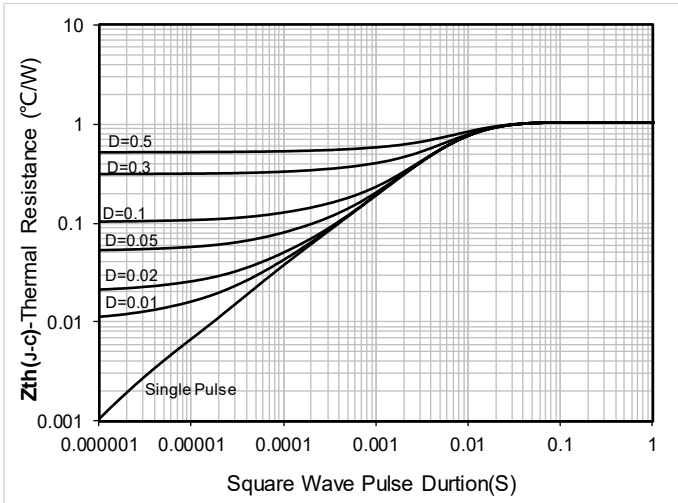


Figure 13. Maximum Transient Thermal Impedance

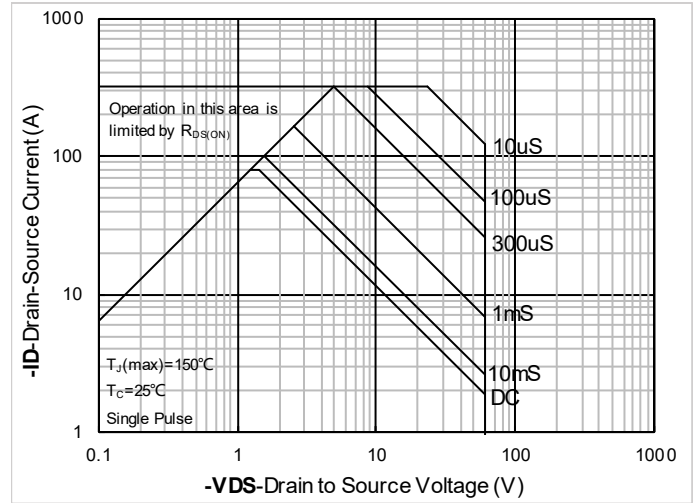
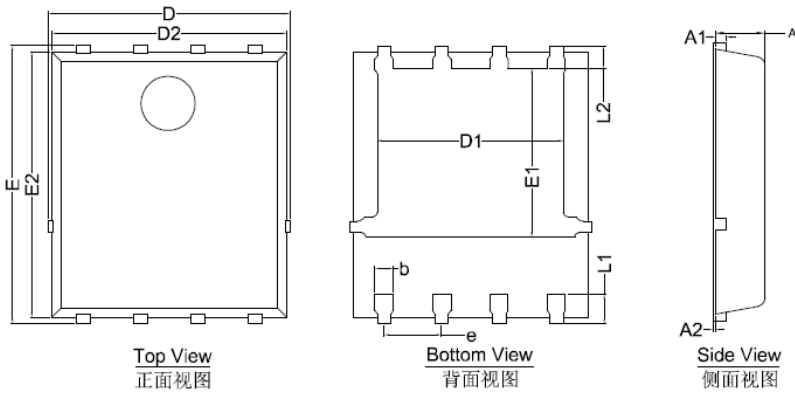


Figure 14. Safe Operation Area

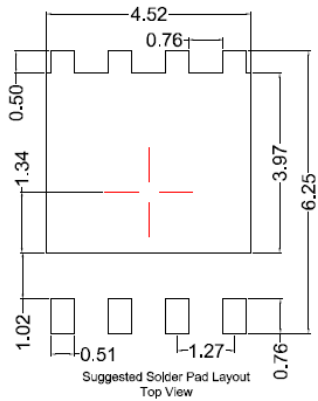


# YJG80GP06BQ

## ■ Package information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	5.15	5.35	5.55
E	5.95	6.15	6.35
A	1.00	1.10	1.20
A1	0.254 BSC		
A2			0.10
D1	3.92	4.12	4.32
E1	3.52	3.72	3.92
D2	5.00	5.20	5.40
E2	5.66	5.86	6.06
L1	0.56	0.66	0.76
L2	0.50 BSC		
b	0.31	0.41	0.51
e	1.27 BSC		



Note:  
 1. Controlling dimension: in millimeters.  
 2. General tolerance:  $\pm 0.10$ mm.  
 3. The pad layout is for reference purposes only.



## YJG80GP06BQ

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