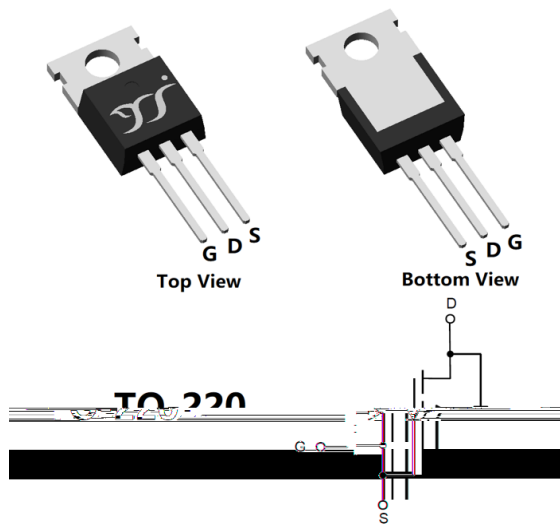


## P-Channel Enhancement Mode Field Effect Transistor



### Product Summary

- $V_{DS}$  -100V
- $I_D$  -30A
- $R_{DS(ON)}$  ( at  $V_{GS}=-10V$  ) <56 mohm
- $R_{DS(ON)}$  ( at  $V_{GS}=-4.5V$  ) <62 mohm
- 100% EAS Tested
- 100%  $\nabla V_{DS}$  Tested

### General Description

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

### Applications

- DC-DC Converters
- Power management functions

### ■ 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		$V_{GS}$	$\pm 20$	V
Drain Current	$T_C=25^\circ\text{C}$	$I_D$	-30	A
	$T_C=100^\circ\text{C}$		-19.2	
Pulsed Drain Current <sup>A</sup>		$I_{DM}$	-120	A
Avalanche energy <sup>B</sup>		$E_{AS}$	162	mJ
Total Power Dissipation <sup>C</sup>	$T_C=25^\circ\text{C}$	$P_D$	125	W
	$T_C=100^\circ\text{C}$		50	
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

### ■ Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient <sup>D</sup>	$t \leq 10S$	$R_{\theta JA}$	12	15	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Ambient <sup>D</sup>	Steady-State		50	60	
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	0.8	1.0	

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJP30GP10A	B1	YJP30GP10A	50	/	5000	Tube



# YJP30GP10A

## ■ 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	T <sub>J</sub> =25°C		-1	μA
			T <sub>J</sub> =55°C		-5	
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	-1.0	-1.8	-2.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> =-15A		42	56	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> =-7A		46	62	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-15A, V <sub>GS</sub> =0V			-1.3	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>				-30	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-50V, V <sub>GS</sub> =0V, f=1MHZ		2100		pF
Output Capacitance	C <sub>oss</sub>			236		
Reverse Transfer Capacitance	C <sub>rss</sub>			48		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g(-10V)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-50V, I <sub>D</sub> =-5A		40		nC
Total Gate Charge	Q <sub>g(-4.5V)</sub>			19.4		
Gate-Source Charge	Q <sub>gs</sub>			7.8		
Gate-Drain Charge	Q <sub>gd</sub>			8.6		
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =-5A, di/dt=100A/us		280		nC
Reverse Recovery Time	t <sub>rr</sub>			104		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =-10V, V <sub>DD</sub> =-50V, I <sub>DS</sub> =-5A R <sub>GEN</sub> =6Ω		13		ns
Turn-on Rise Time	t <sub>r</sub>			39		
Turn-off Delay Time	t <sub>D(off)</sub>			100.1		
Turn-off fall Time	t <sub>f</sub>			105.3		

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

B. V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω, L=0.5mH.

C. Pd is based on max. junction temperature, using junction-case thermal resistance.

D. The value of RθJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25° C. The Power dissipation PDSM is based on RθJA ≤ 10s and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design.



## ■ Typical Performance Characteristics

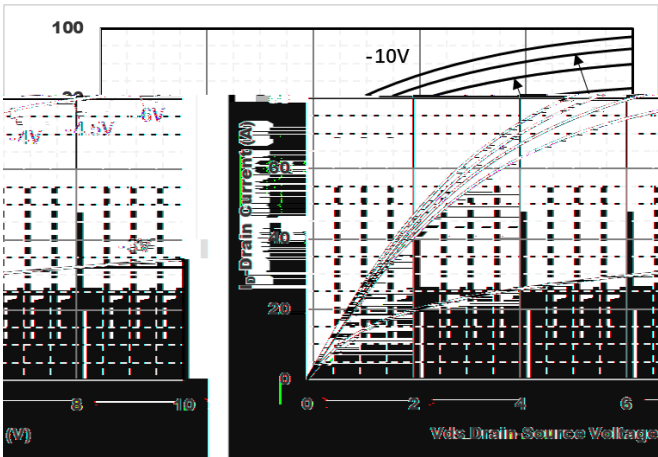


Figure1. Output Characteristics

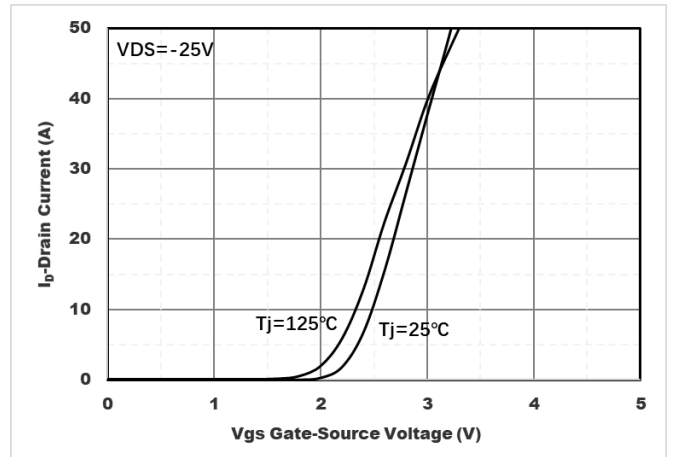


Figure2. Transfer Characteristics

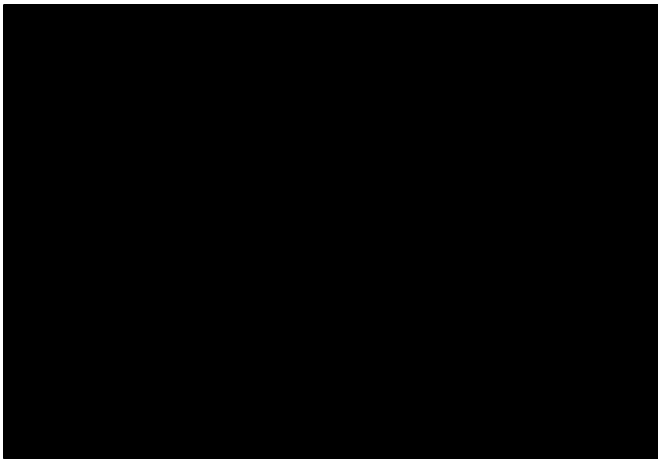


Figure3. Capacitance Characteristics

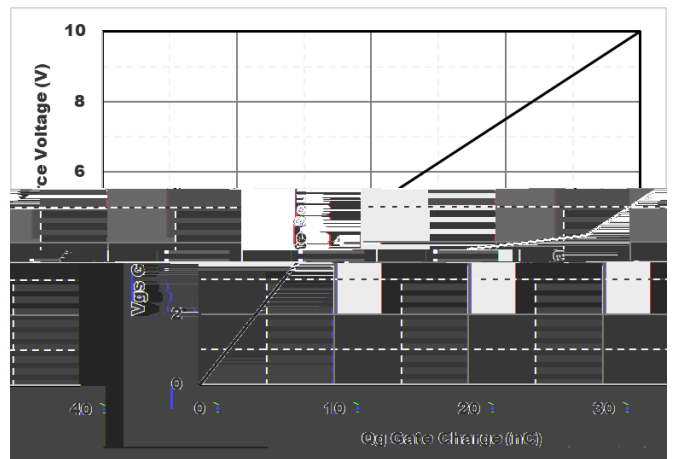


Figure4. Gate Charge

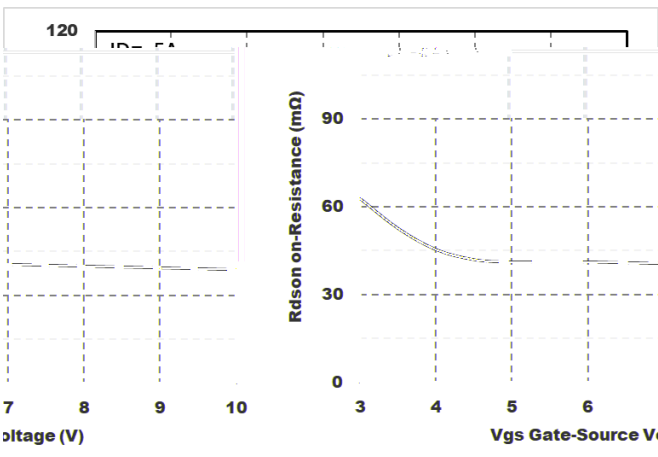


Figure5. : On-Resistance vs. Gate to Source Voltage

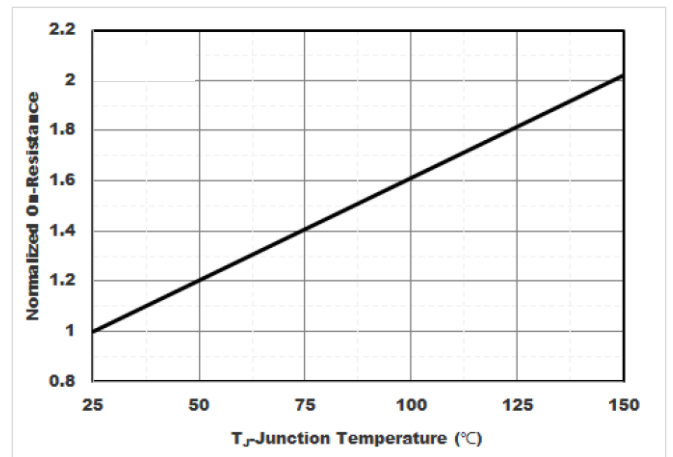


Figure6. Normalized On-Resistance



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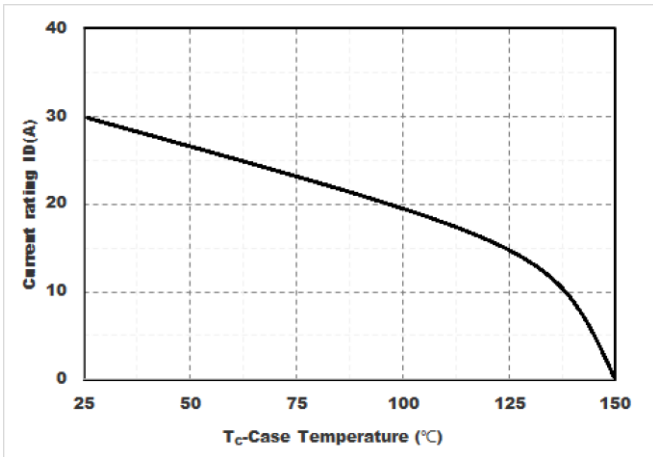


Figure7. Drain current

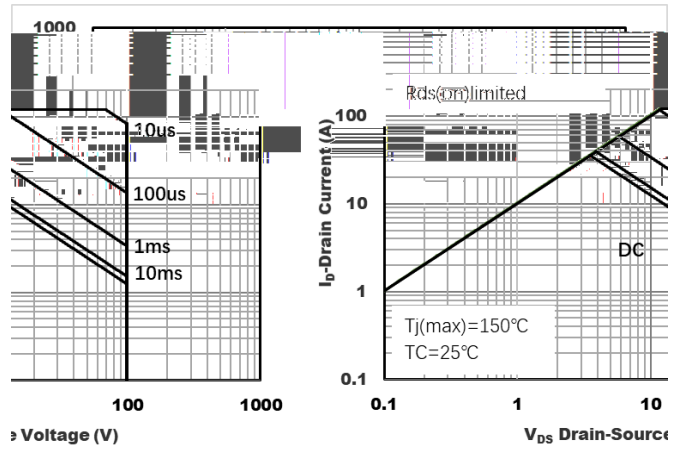


Figure8.Safe Operation Area

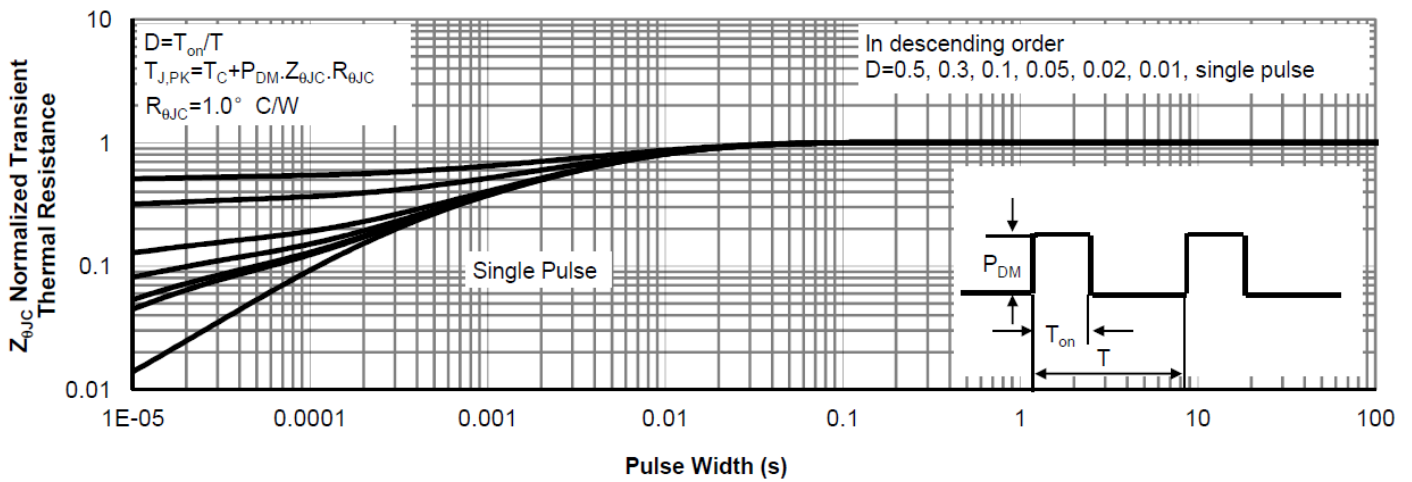


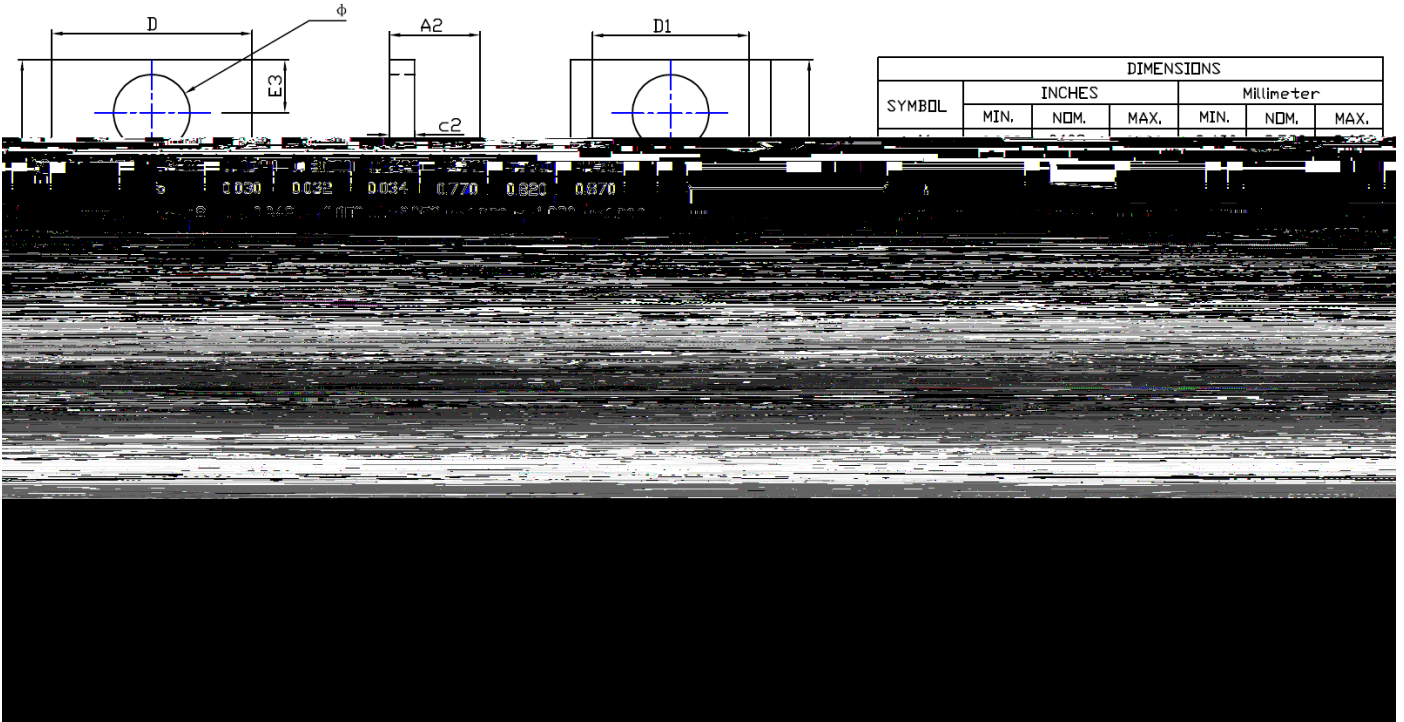
Figure9.Normalized Maximum Transient thermal impedance



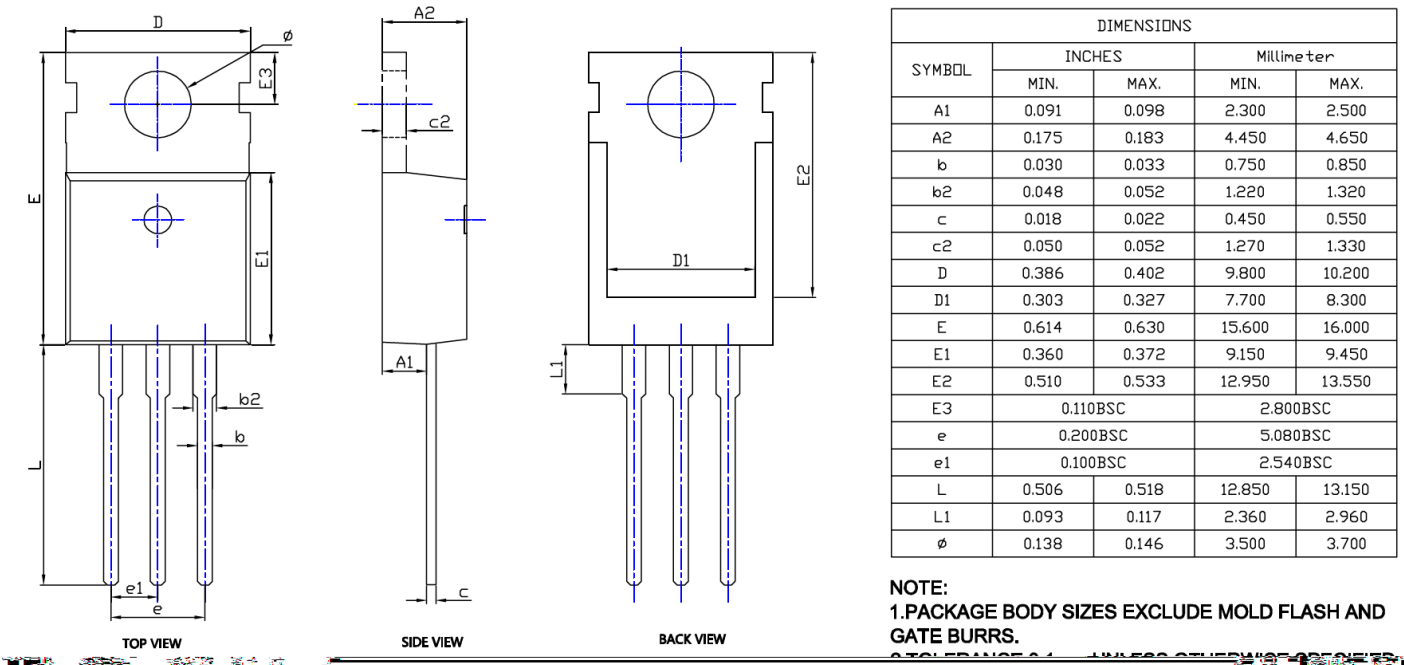
# YJP30GP10A

## TO-220AB Package Information

### Type B:



### Type D:





# YJP30GP10A

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