



YJD45G10B

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

V_{DS}	100V
I_D	45A
$R_{DS(on)}$ (at $V_{GS}=10V$)	17 mohm
100% EAS Tested	
100% V_{DS} Tested	

General Description

Low $R_{DS(on)}$ & FOM
Extremely low switching loss
Excellent stability and uniformity
Fast switching and soft recovery
Moisture Sensitivity Level 1
Epoxy Meets UL 94 V-0 Flammability Rating
Halogen Free

Applications

Power switching application
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}	100	V
Gate-source Voltage		V_{GS}	20	V
Drain Current	$T_A=25$	I_D	7.5	A
	$T_A=100$		4.5	
	$T_C=25$		45	
	$T_C=100$		28.5	
Pulsed Drain Current ^A		I_{DM}	180	A



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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 =250	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	
Gate-Body Leakage Current	I _{GSS}	V _{GS} = 20V, V _{DS} =0V			100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250	2	2.8	4	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D =20A		14	17	m
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V			1.3	V
Maximum Body-Diode Continuous Current	I _S				45	A
Gate resistance	R _G	f= 1 MHz, Open drain		1		
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHZ		1135		pF
Output Capacitance	C _{oss}			399		
Reverse Transfer Capacitance	C _{rss}			18		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =50V, I _D =25A		16		nC
Gate-Source Charge	Q _{gs}			5.6		
Gate-Drain Charge	Q _{gd}			2.4		
Reverse Recovery Charge	Q _{rr}	I _F =20A, di/dt=100A/us		42		ns
Reverse Recovery Time	t _{rr}			39.8		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =50V, I _D =25A R _{GEN} =2.2		39.2		ns
Turn-on Rise Time	t _r			11		
Turn-off Delay Time	t _{D(off)}			53.2		
Turn-off fall Time	t _f			15.8		

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

B. V_{DD}=50V, R_G 0.5mH, I_{AS}=18A,.

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

D. The value of R_{JA} 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 R_{JA} nction temperature of 150 C. The value in any given application depends on the user's specific board design.



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Typical Performance Characteristics

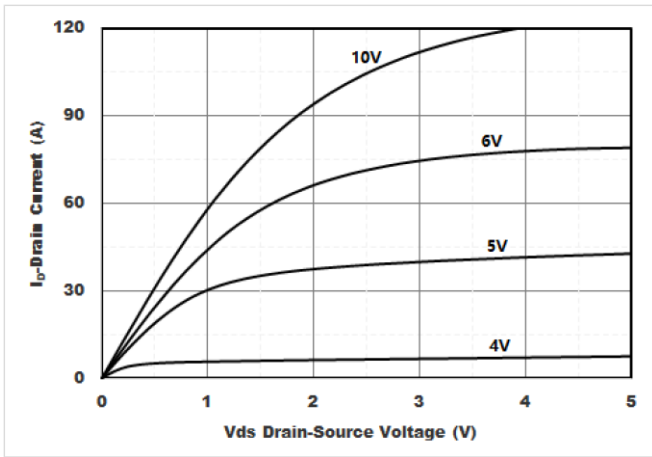


Figure1. Output Characteristics

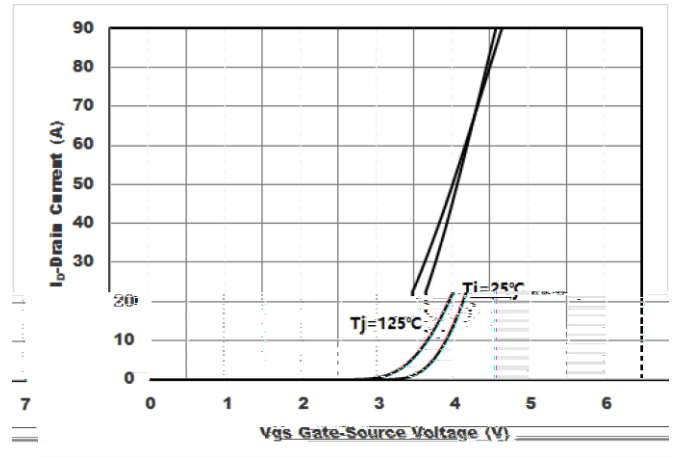


Figure2. Transfer Characteristics

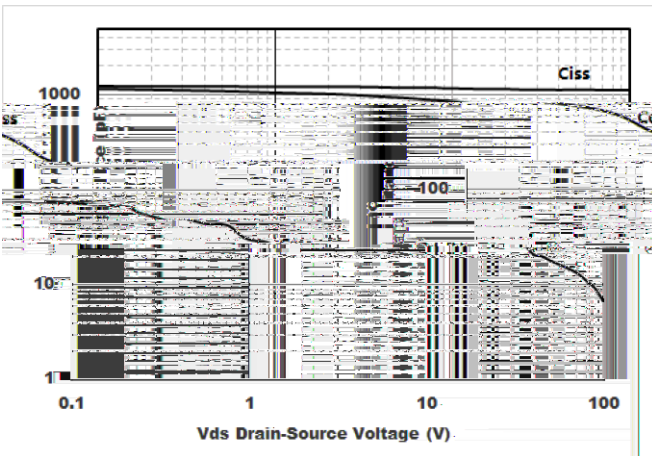


Figure3. Capacitance Characteristics

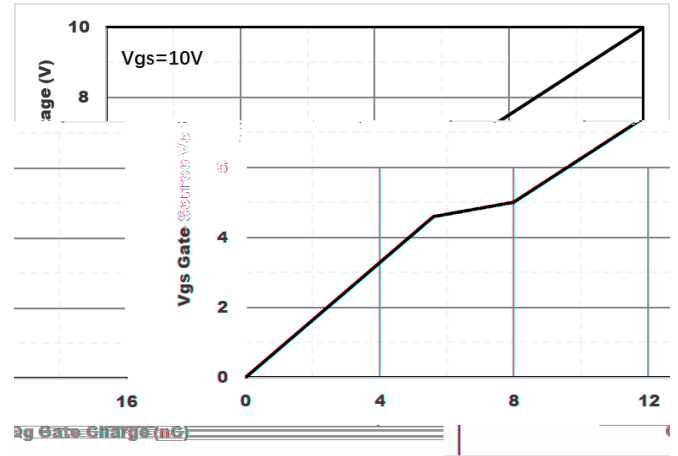


Figure4. Gate Charge

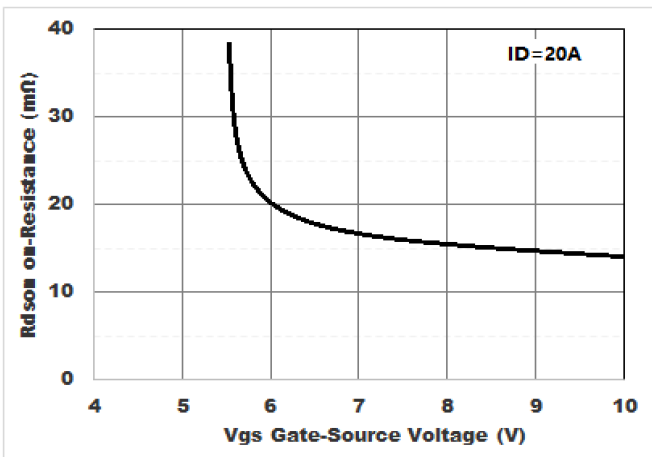


Figure5. On-Resistance vs. Drain Current and Gate Voltage

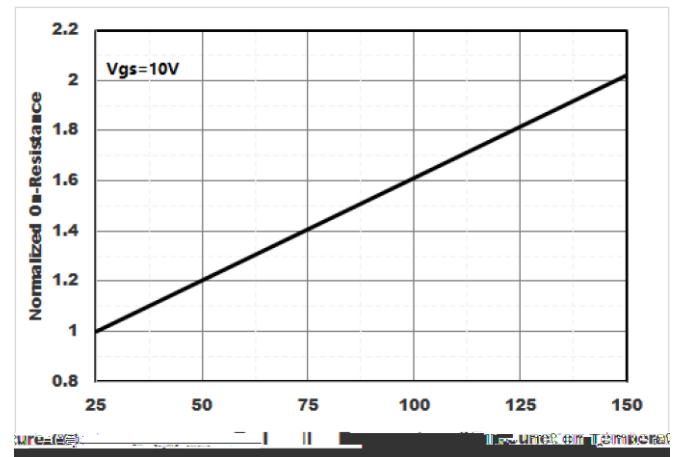


Figure6. Normalized On-Resistance



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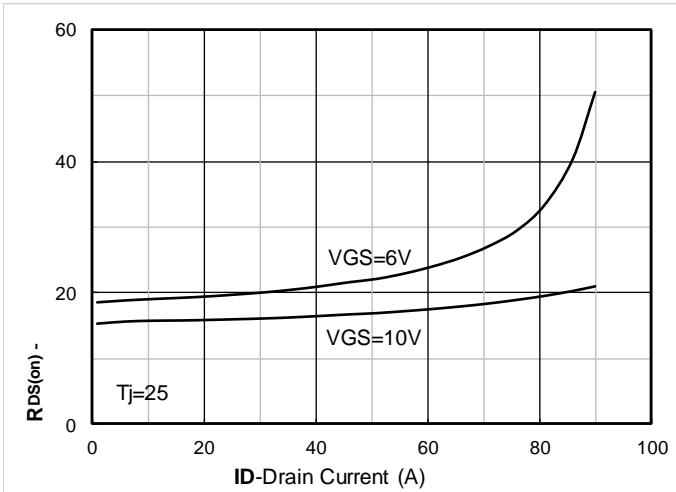


Figure 7. $R_{DS(on)}$ VS Drain Current

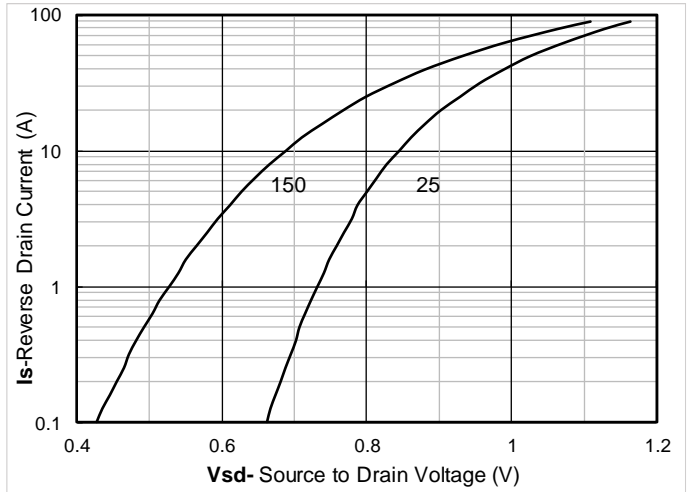


Figure 8. Forward characteristics of reverse diode

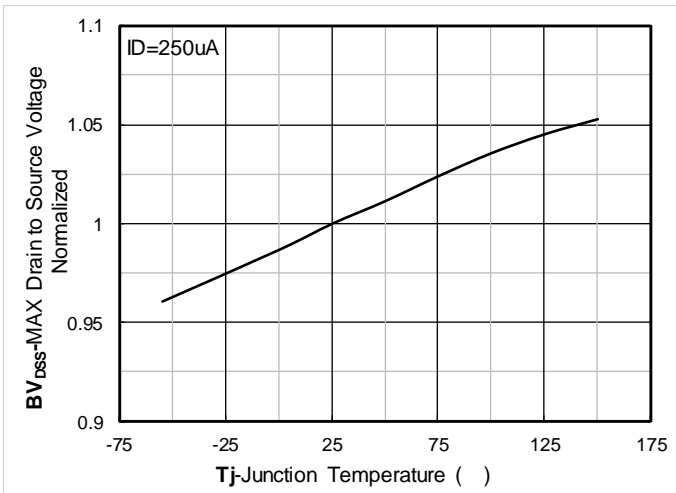


Figure 9. Normalized breakdown voltage

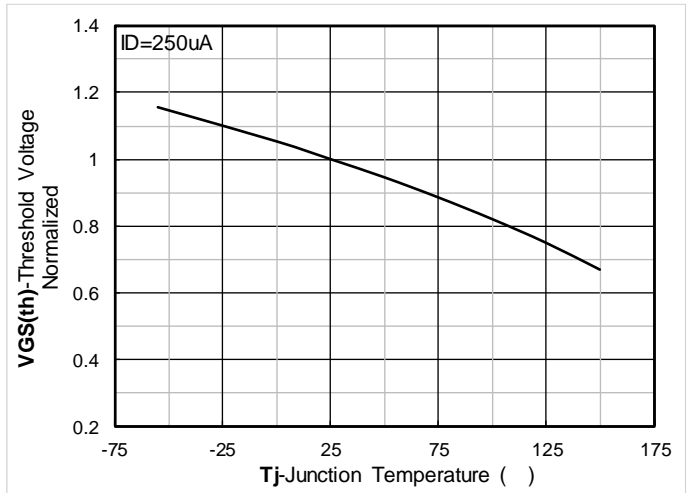


Figure 10. Normalized Threshold voltage

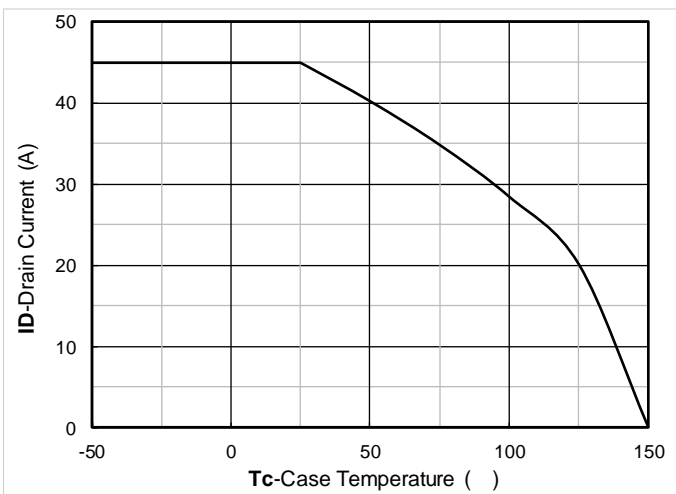


Figure 11. Current dissipation

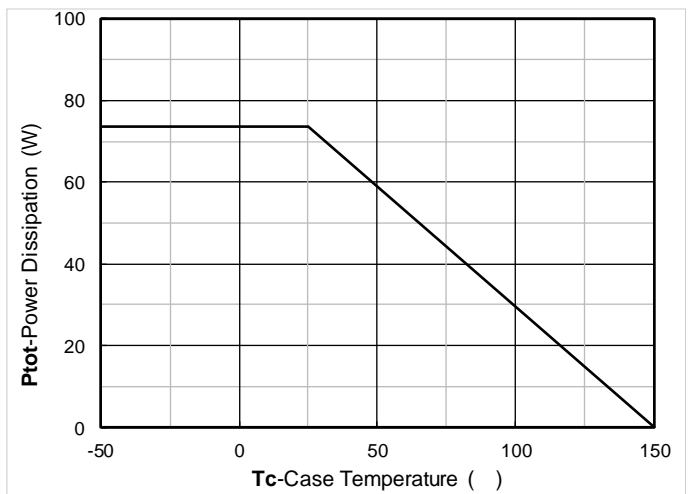


Figure 12. Power dissipation



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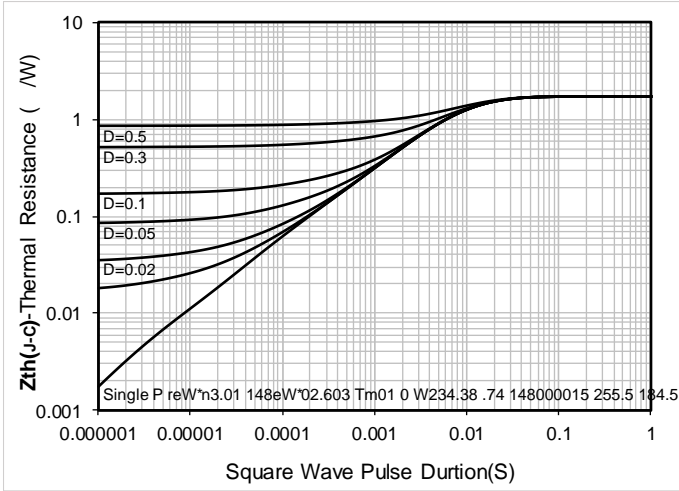


Figure 13. Maximum Transient Thermal Impedance

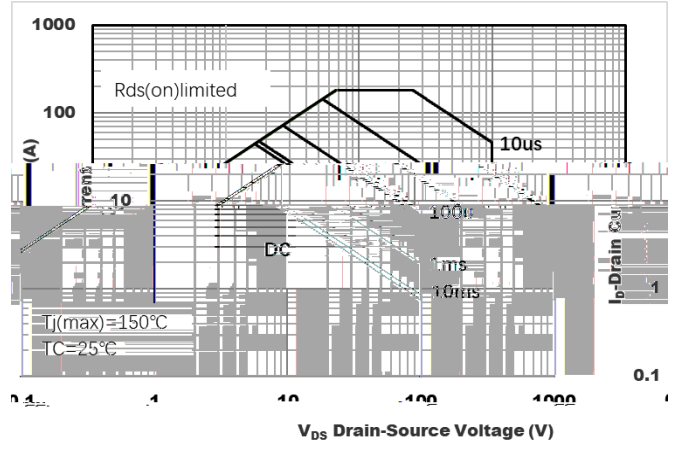
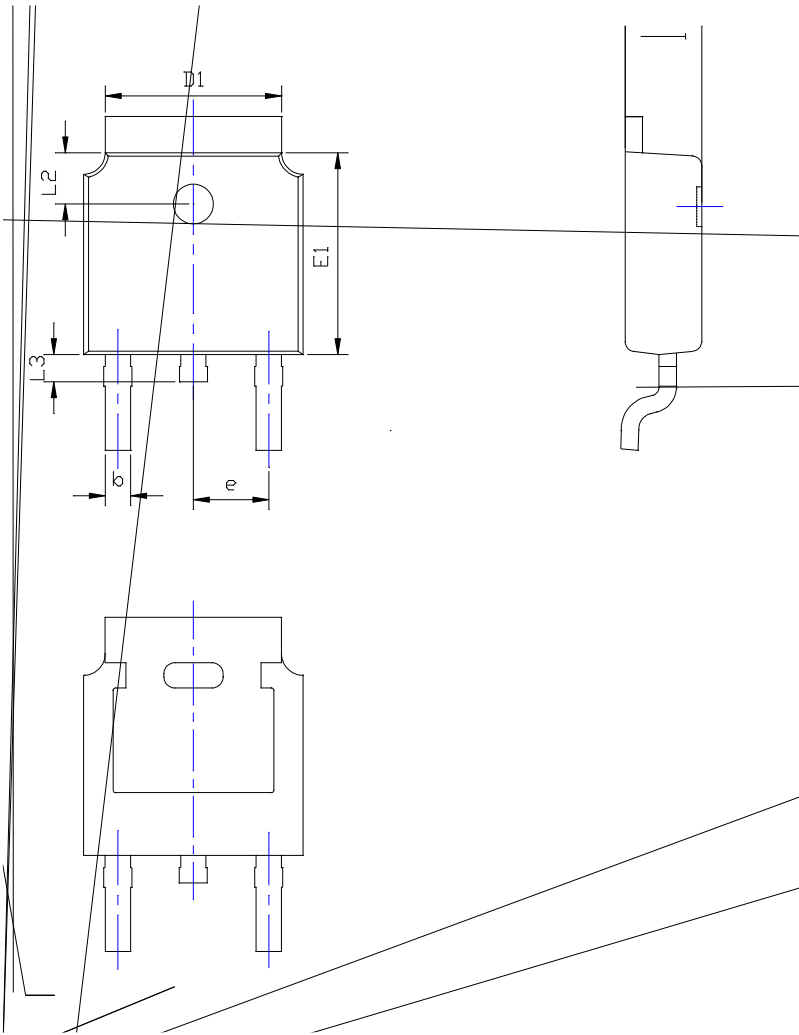


Figure 14. Safe Operation Area



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TO-252-B Package information



SYMBOL	INCHES					
	MIN.	NOM.				
A1	0.000					
A2	0.087	0.091				
A3	0.035	0.039				
b	0.026	0.030				
c	0.018	0.020				
D	0.256	0.260				
D1						
D2	0.181	0.189				
E	0.390	0.398				
E1	0.236	0.240				

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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