



N-Channel Enhancement Mode Field Effect Transistor

Product Summary

- V_{DS} 60V
- I_D (Silicon limited) 150A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <3.5 mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <5.0 mohm
- 100% EAS Tested
- 100% ∇V_{DS} Tested
- ESD Protected up to 2.0KV(HBM)

General Description

- Split Gate Trench 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

- Synchronous Rectification
- Battery Protection Circuit
- Motor drivers and



YJB150G06AK

■ Electrical Characteristics (T_j=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60, V _{GS} =0V			1	μA
		V _{DS} =60, V _{GS} =0V, T _j =150			100	
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			±10	μA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1.0	1.7	2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D =20A		2.7	3.5	mΩ
		V _{GS} = 4.5V, I _D =20A		3.5	4.8	mΩ
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V		0.8	1.3	V
Maximum Body-Diode Continuous Current	I _S				150	A
Gate resistance	R _G	f= 1 MHz		2.0		Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHZ		4650		pF
Output Capacitance	C _{oss}			850		
Reverse Transfer Capacitance	C _{rss}			65		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =30V, I _D =25A		71		nC
Gate-Source Charge	Q _{gs}			17		
Gate-Drain Charge	Q _{gd}			10.5		
Reverse Recovery Charge	Q _{rr}	I _r =20A, di/dt=500A/us		39.8		ns
Reverse Recovery Time	t _{rr}			41.6		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =30V, I _D =25A R _{GEN} =2Ω		15.9		ns
Turn-on Rise Time	t _r			55.2		
Turn-off Delay Time	t _{D(off)}			57.5		
Turn-off fall Time	t _f			91.3		

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

B. V_{DD}=50V, R_G=25Ω, L=0.5mH, I_{AS}=42A.

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

D. The value of R_{θJA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25 C. The Power dissipation P_{DSM} is based on R_{θJA} ≤ 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

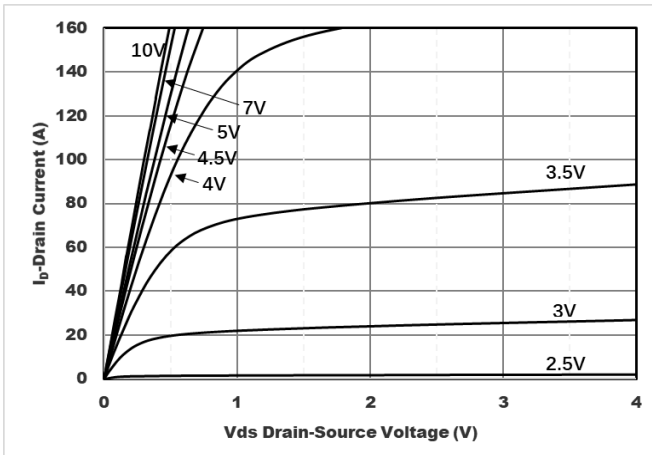


Figure1. Output Characteristics

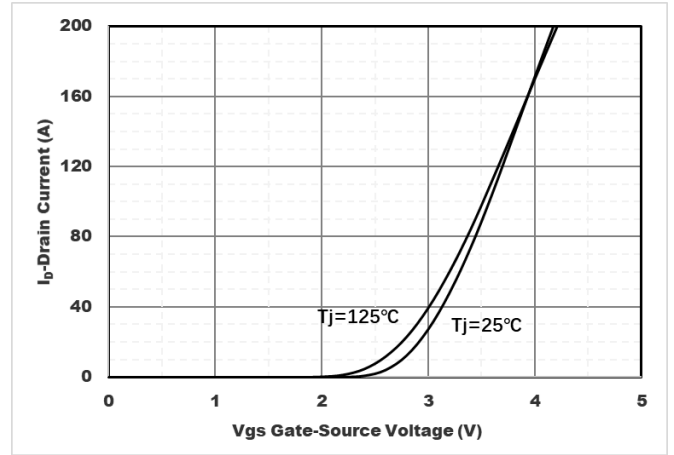


Figure2. Transfer Characteristics

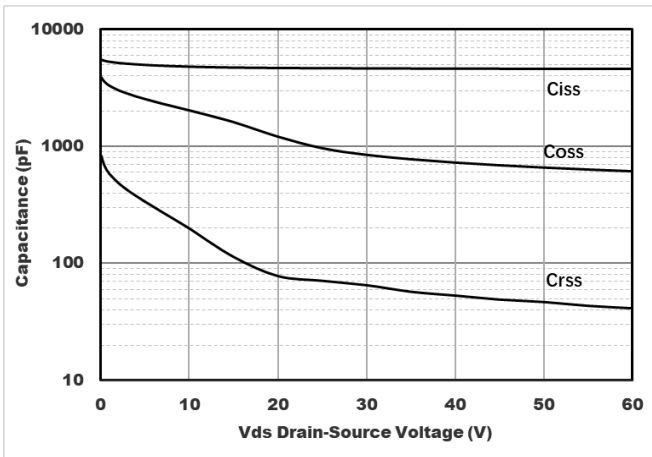


Figure3. Capacitance Characteristics

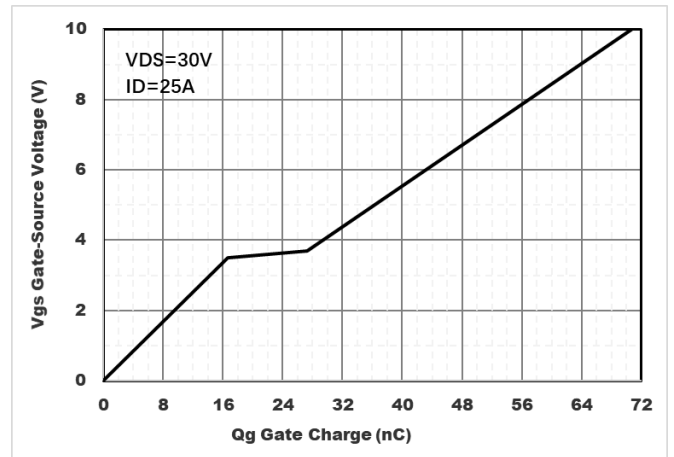


Figure4. Gate Charge

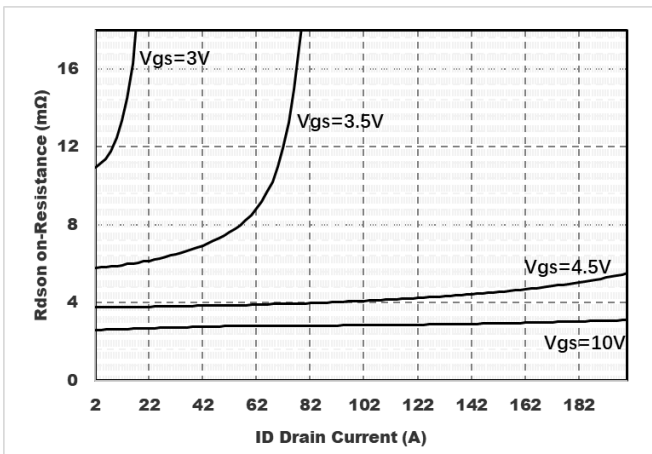


Figure5. On-Resistance vs. Drain Current and Gate Voltage

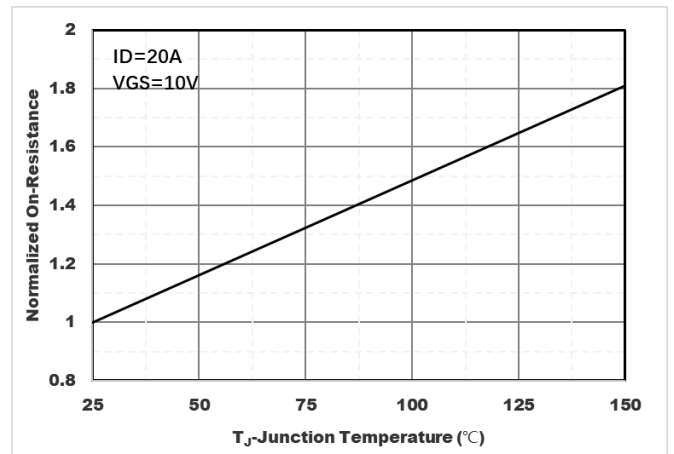


Figure6. Normalized On-Resistance



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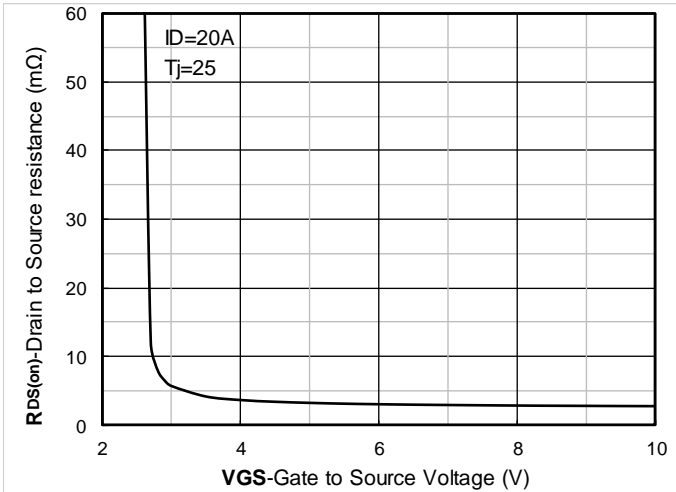


Figure 7. On-Resistance vs Gate to Source Voltage

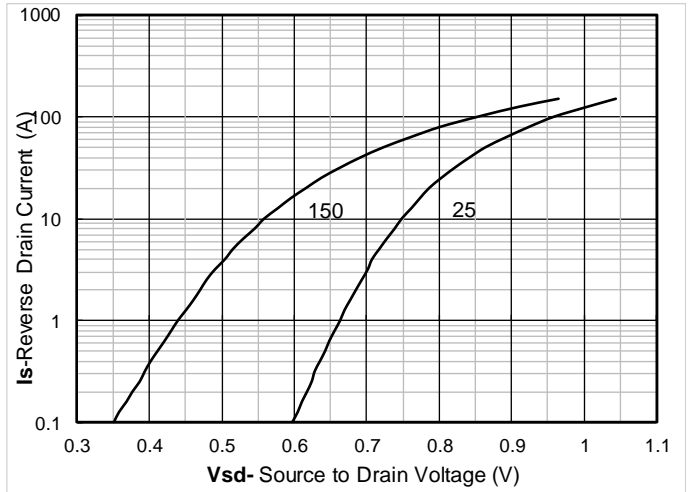


Figure 8. Forward characteristics of reverse diode

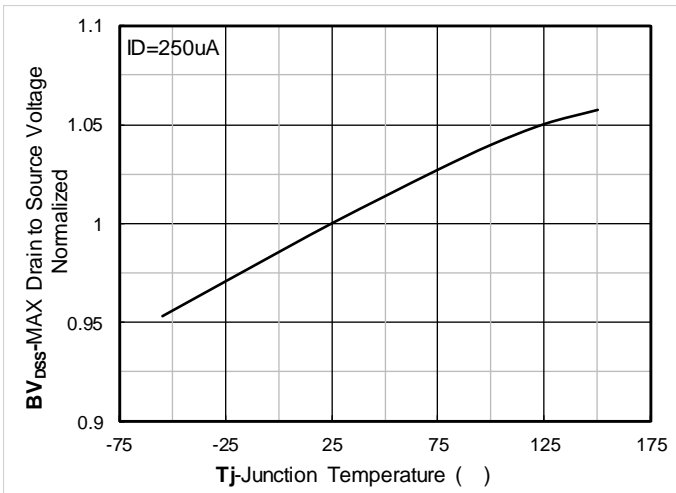


Figure 9. Normalized breakdown voltage

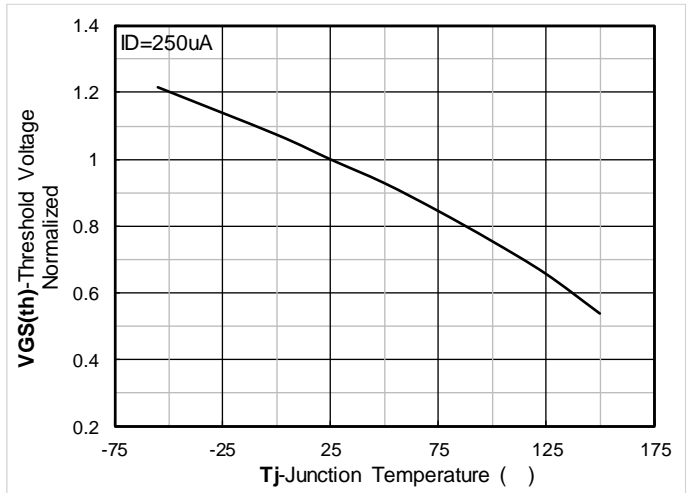


Figure 10. Normalized Threshold voltage

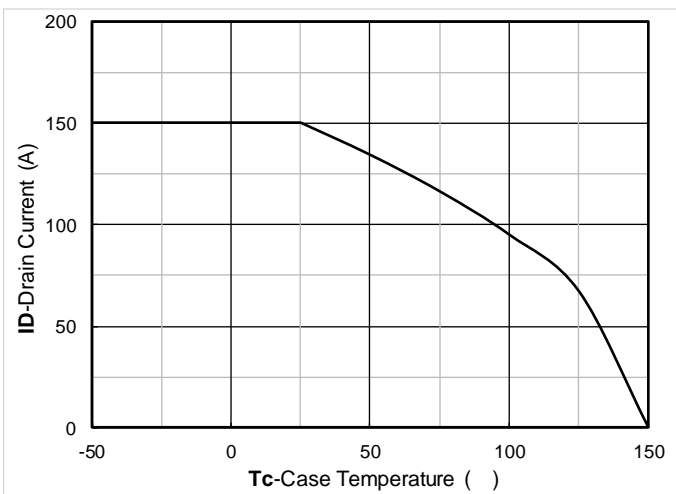


Figure 11. Current dissipation

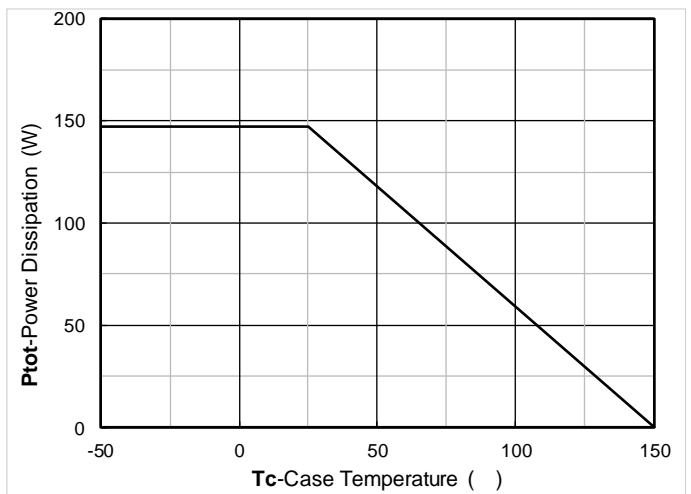


Figure 12. Power dissipation



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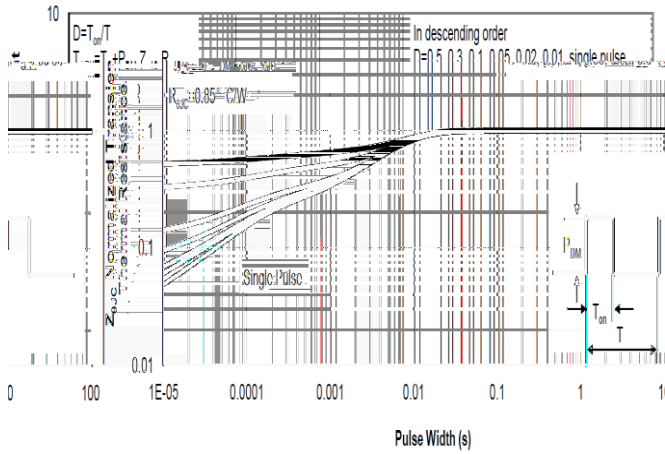


Figure13. Normalized Maximum Transient thermal impedance

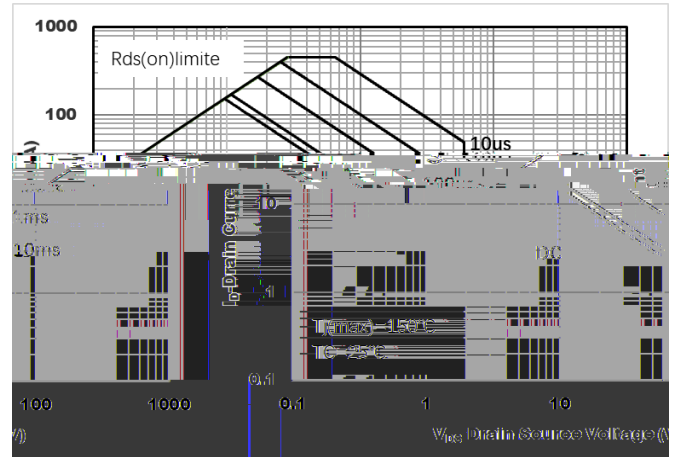
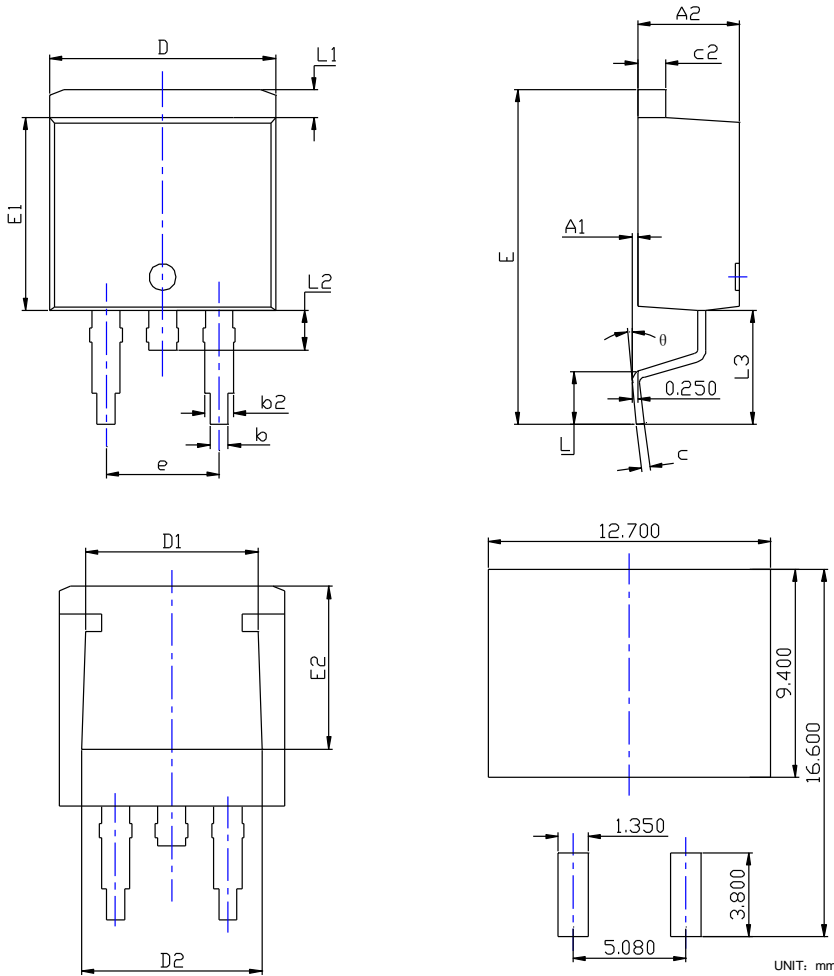


Figure14. Safe Operation Area



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■ TO-263-HY Package information



SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NDM.	MAX.	MIN.	NDM.	MAX.
A1	0.000	---	0.010	0.000	---	0.250
A2	0.174	0.180	0.186	4.430	4.580	4.730
b	0.028	0.032	0.036	0.720	0.820	0.920
b2	0.046	0.050	0.054	1.180	1.280	1.380
c	0.013	0.015	0.018	0.330	0.390	0.450
c2	0.048	0.050	0.053	1.220	1.280	1.340
D	0.394	0.400	0.406	10.000	10.150	10.300
D1	0.295	0.307	0.319	7.500	7.800	8.100
D2	0.303	0.315	0.327	7.700	8.000	8.300
E	0.571	0.591	0.610	14.500	15.000	15.500
E1	0.337	0.341	0.348	8.550	8.700	8.850
E2	0.276	0.287	0.299	7.000	7.300	7.600
e	0.200BSC			5.080BSC		
L	0.070	---	0.110	1.790	---	2.790
L1	0.044	---	0.056	1.120	---	1.420
L2	0.030	---	0.070	0.770	---	1.770
L3	0.197REF			5.000REF		
θ	0°	---	8°	0°	---	8°

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.



YJB150G06AK

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