

International IOR Rectifier HEXFET® POWER MOSFET

JANTX2N6766 JANTXV2N6766 [REF:MIL-PRF-19500/543] [GENERIC:IRF250] N-CHANNEL

200 Volt, 0.085Ω HEXFET

HEXFET technology is the key to International Rectifier's advanced line of power MOSFET transistors. The efficient geometry achieves very low on-state resistance combined with high transconductance.

HEXFET transistors also feature all of the well-established advantages of MOSFETs, such as voltage control, very fast switching, ease of paralleling and electrical parameter temperature stability. They are well-suited for applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers, and high energy pulse circuits, and virtually any application where high reliability is required.

Product Summary

Part Number	BV _{DSS}	R _{DS(on)}	I _D
JANTX2N6766	200V	0.085Ω	30A
JANTXV2N6766			

Features:

- Avalanche Energy Rating
- Dynamic dv/dt Rating
- Simple Drive Requirements
- Ease of Paralleling
- Hermetically Sealed


Absolute Maximum Ratings

	Parameter	JANTX2N6766, JANTXV2N6766	Units
I _D @ V _{GS} = 10V, T _C = 25°C	Continuous Drain Current	30	A
I _D @ V _{GS} = 10V, T _C = 100°C	Continuous Drain Current	19	
I _{DM}	Pulsed Drain Current ①	120	
P _D @ T _C = 25°C	Max. Power Dissipation	150	W
	Linear Derating Factor	1.2	W/K ⑤
V _{GS}	Gate-to-Source Voltage	±20	V
EAS	Single Pulse Avalanche Energy ②	500	mJ
I _{AR}	Avalanche Current ①	30	A
E _{AR}	Repetitive Avalanche Energy ①	15	mJ
dv/dt	Peak Diode Recovery dv/dt ③	5.0	V/ns
T _J	Operating Junction	-55 to 150	°C
T _{STG}	Storage Temperature Range		
	Lead Temperature	300 (0.063 in. (1.6mm) from case for 10.5 seconds)	
	Weight	11.5 (typical)	g

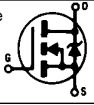


JANTX2N6766, JANTXV2N6766 Device

Electrical Characteristics @ T_j = 25°C (Unless Otherwise Specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain-to-Source Breakdown Voltage	200	—	—	V	V _{GS} = 0V, I _D = 1.0 mA
ΔBVDSS/ΔT _J	Temperature Coefficient of Breakdown Voltage	—	0.29	—	V/°C	Reference to 25°C, I _D = 1.0 mA
RDS(on)	Static Drain-to-Source On-State Resistance	—	—	0.085	Ω	V _{GS} = 10V, I _D = 19A ④
		—	—	0.090		V _{GS} = 10V, I _D = 30A
VGS(th)	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} = V _{GS} , I _D = 250μA
gfs	Forward Transconductance	9.0	—	—	S (r)	V _{DS} > 15V, I _{DS} = 19A ④
IDSS	Zero Gate Voltage Drain Current	—	—	25	μA	V _{DS} = 0.8 x Max Rating, V _{GS} = 0V
		—	—	250		V _{DS} = 0.8 x Max Rating V _{GS} = 0V, T _J = 125°C
IGSS	Gate-to-Source Leakage Forward	—	—	100	nA	V _{GS} = 20V
IGSS	Gate-to-Source Leakage Reverse	—	—	-100	nA	V _{GS} = -20V
Qg	Total Gate Charge	55	—	115	nC	V _{GS} = 10V, I _D = 30A
Qgs	Gate-to-Source Charge	8	—	22		V _{DS} = Max. Rating x 0.5 see figures 6 and 13
Qgd	Gate-to-Drain ("Miller") Charge	30	—	60		V _{DD} = 100V, I _D = 30A, R _G = 3.5Ω, V _{GS} = 10V
td(on)	Turn-On Delay Time	—	—	35	ns	see figure 10
t _r	Rise Time	—	—	190		
td(off)	Turn-Off Delay Time	—	—	170		
t _f	Fall Time	—	—	130		
LD	Internal Drain Inductance	—	5.0	—	nH	Measured from the drain lead, 6mm (0.25 in.) from package to center of die. Modified MOSFET symbol showing the internal inductances.
LS	Internal Source Inductance	—	13	—		Measured from the source lead, 6mm (0.25 in.) from package to source bonding pad. 
C _{iss}	Input Capacitance	—	3500	—	pF	V _{GS} = 0V, V _{DS} = 25V f = 1.0 MHz see figure 5
C _{oss}	Output Capacitance	—	700	—		
C _{rss}	Reverse Transfer Capacitance	—	110	—		

Source-Drain Diode Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I _S	Continuous Source Current (Body Diode)	—	—	30	A	Modified MOSFET symbol showing the integral reverse p-n junction rectifier. 
I _{SM}	Pulse Source Current (Body Diode) ①	—	—	120		
V _{SD}	Diode Forward Voltage	—	—	1.9	V	T _j = 25°C, I _S = 30A, V _{GS} = 0V ④
t _{rr}	Reverse Recovery Time	—	—	950	ns	T _j = 25°C, I _F = 30A, di/dt ≤ 100A/μs V _{DD} ≤ 50V ④
Q _{RR}	Reverse Recovery Charge	—	—	9.0	μC	
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible. Turn-on speed is substantially controlled by L _S + L _D .				

Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
R _{thJC}	Junction-to-Case	—	—	0.83	K/W	Typical socket mount
R _{thJA}	Junction-to-Ambient	—	—	48		

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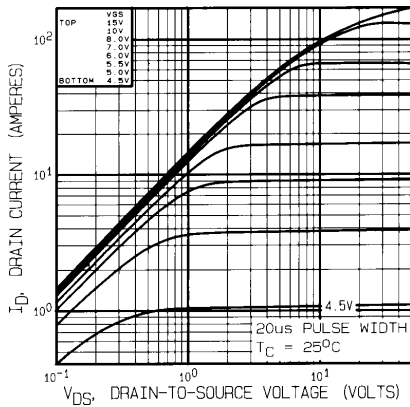


Fig. 1 — Typical Output Characteristics
 $T_C = 25^\circ\text{C}$

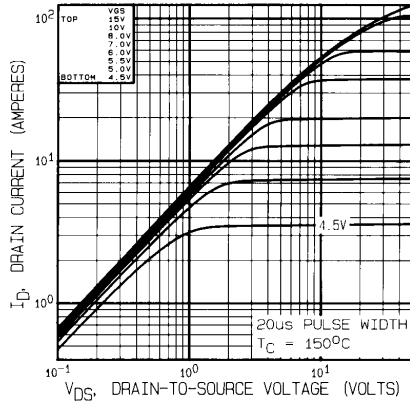


Fig. 2 — Typical Output Characteristics
 $T_C = 150^\circ\text{C}$

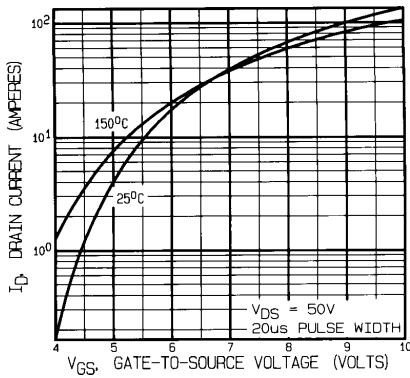


Fig. 3 — Typical Transfer Characteristics

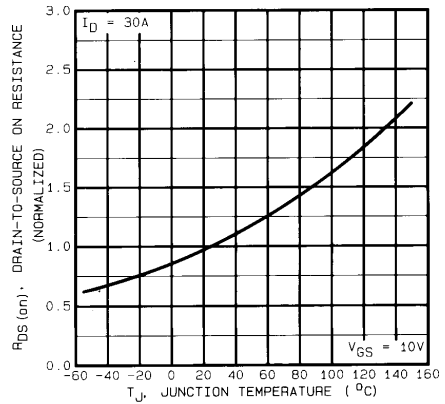


Fig. 4 — Normalized On-Resistance Vs. Temperature

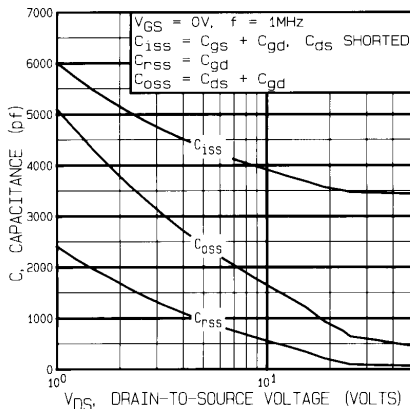


Fig. 5 — Typical Capacitance Vs. Drain-to-Source Voltage

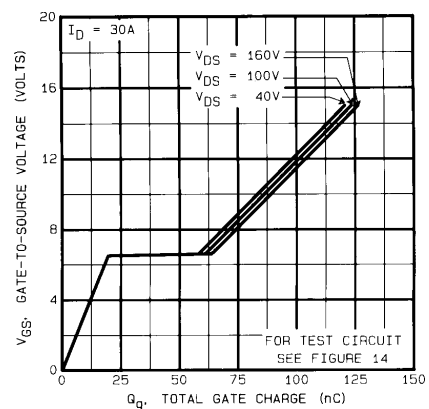


Fig. 6 — Typical Gate Charge Vs. Gate-to-Source Voltage

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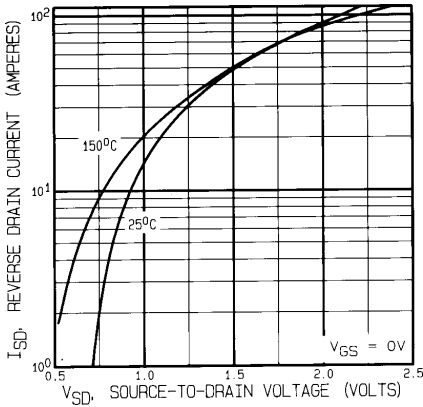


Fig. 7 — Typical Source-to-Drain Diode Forward Voltage

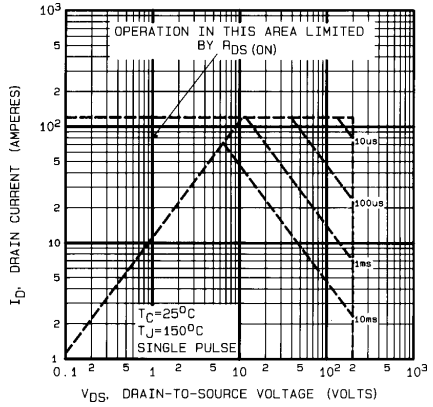


Fig. 8 — Maximum Safe Operating Area

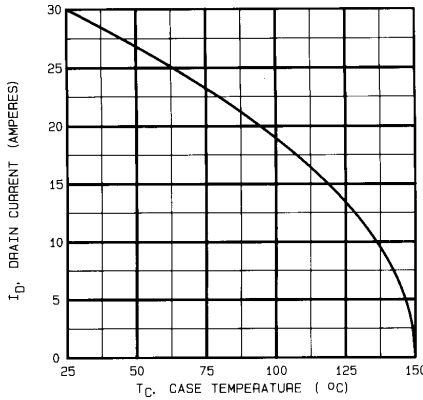


Fig. 9 — Maximum Drain Current Vs. Case Temperature

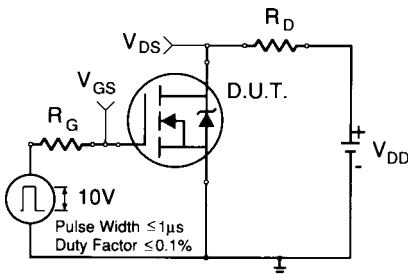


Fig. 10a — Switching Time Test Circuit

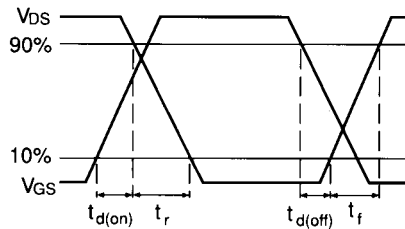


Fig. 10b — Switching Time Waveforms

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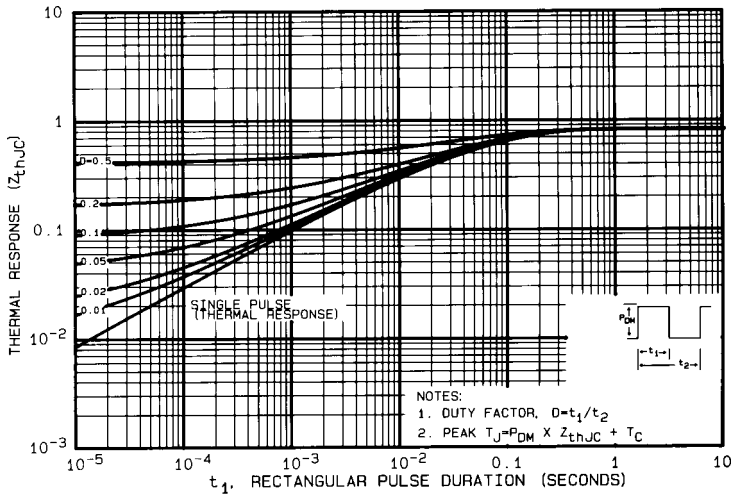


Fig. 11 — Maximum Effective Transient Thermal Impedance, Junction-to-Case Vs. Pulse Duration

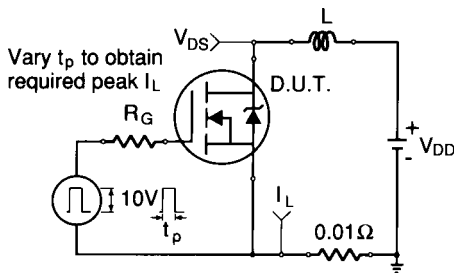


Fig. 12a — Unclamped Inductive Test Circuit

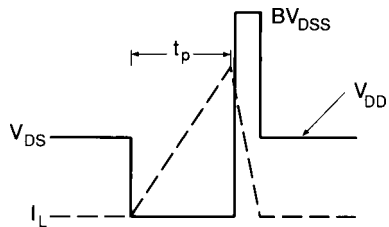


Fig. 12b — Unclamped Inductive Waveforms

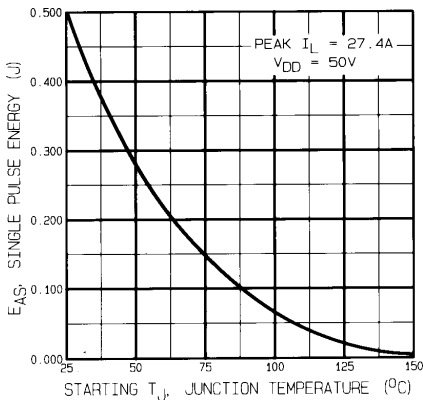


Fig. 12c — Max. Avalanche Energy vs. Current

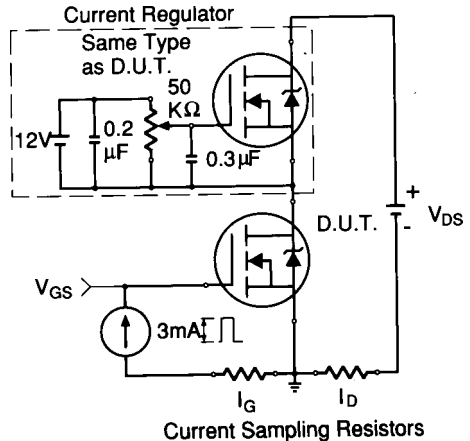


Fig. 12d — Gate Charge Test Circuit

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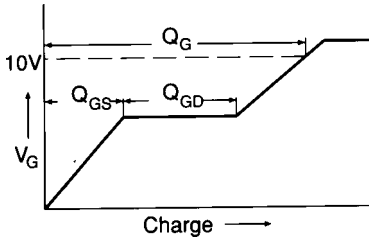
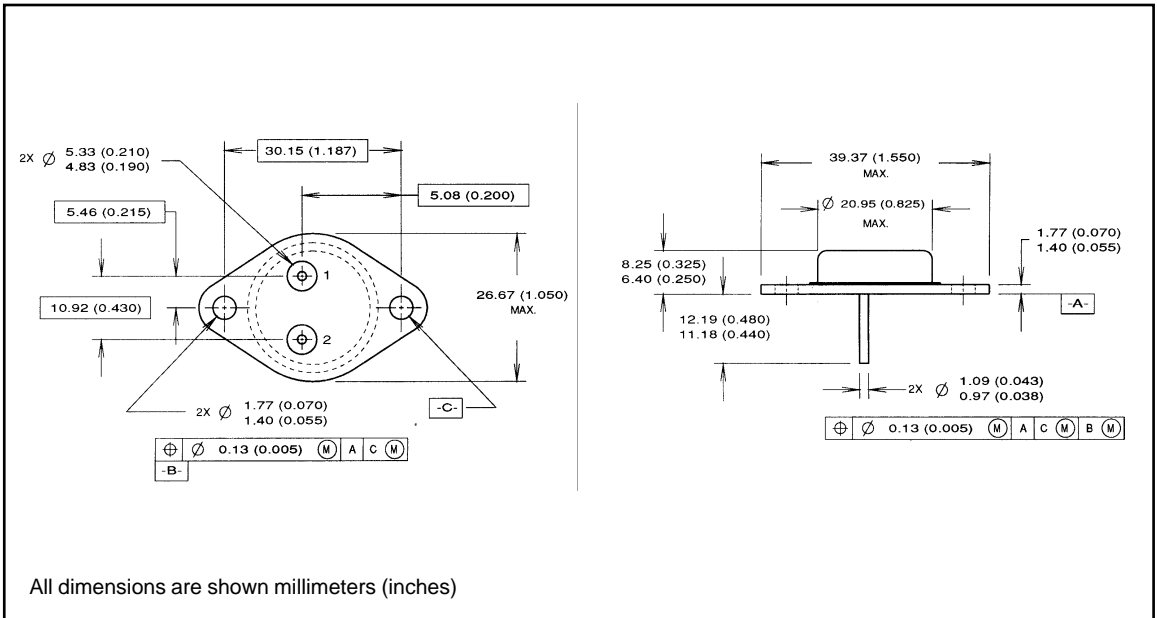


Fig. 13b — Basic Gate Charge Waveform

- ① Repetitive Rating; Pulse width limited by maximum junction temperature. (see figure 11)
- ② @ $V_{DD} = 50V$, Starting $T_J = 25^\circ C$,
 $EAS = [0.5 * L * (I_L^2) * [BV_{DSS}/(BV_{DSS}-V_{DD})]$
 Peak $I_L = 30A$, $V_{GS} = 10V$, $25 \leq R_G \leq 200\Omega$
- ③ $I_{SD} \leq 30A$, $di/dt \leq 190A/\mu s$,
 $V_{DD} \leq BV_{DSS}$, $T_J \leq 150^\circ C$
- ④ Pulse width $\leq 300 \mu s$; Duty Cycle $\leq 2\%$
- ⑤ $K/W = ^\circ C/W$
 $W/K = W/^\circ C$

Case Outline and Dimensions — TO-204AA (Modified TO-3)



International
IR Rectifier

WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, Tel: (310) 322 3331
EUROPEAN HEADQUARTERS: Hurst Green, Oxted, Surrey RH8 9BB, UK Tel: ++ 44 1883 732020
IR CANADA: 7321 Victoria Park Ave., Suite 201, Markham, Ontario L3R 2Z8, Tel: (905) 475 1897
IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg Tel: ++ 49 6172 96590
IR ITALY: Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 11 451 0111
IR FAR EAST: K&H Bldg., 2F, 3-30-4 Nishi-Ikeburo 3-Chome, Toshima-Ki, Tokyo Japan 171 Tel: 81 3 3983 0086
IR SOUTHEAST ASIA: 315 Outram Road, #10-02 Tan Boon Liat Building, Singapore 0316 Tel: 65 221 8371
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