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Provisional Data Sheet No. PD-9.337E

International **IR** Rectifier

HEXFET® POWER MOSFET

JANTX2N6764

JANTXV2N6764

[REF:MIL-PRF-19500/543]

[GENERIC:IRF150]

N-CHANNEL

100 Volt, 0.055Ω 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	BVDSS	RDS(on)	ID
JANTX2N6764	100V	0.055Ω	38A
JANTXV2N6764			

Features:

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

Absolute Maximum Ratings

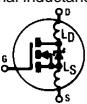
	Parameter	JANTX2N6764, JANTXV2N6764	Units
ID @ VGS = 10V, TC = 25°C	Continuous Drain Current	38	A
ID @ VGS = 10V, TC = 100°C	Continuous Drain Current	24	
IMD	Pulsed Drain Current ①	152	
PD @ TC = 25°C	Max. Power Dissipation	150	W
	Linear Derating Factor	1.2	W/K ⑤
VGS	Gate-to-Source Voltage	±20	V
EAS	Single Pulse Avalanche Energy ②	150	mJ
IAR	Avalanche Current ①	38	A
EAR	Repetitive Avalanche Energy ①	15	mJ
dv/dt	Peak Diode Recovery dv/dt ③	5.5	V/ns
TJ	Operating Junction	-55 to 150	°C
TSTG	Storage Temperature Range		
	Lead Temperature	300 (0.063 in. (1.6mm) from case for 10 seconds)	
	Weight	11.5 (typical)	g



JANTX2N6764, JANTXV2N6764 Device

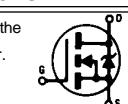
Electrical Characteristics @ $T_j = 25^\circ\text{C}$ (Unless Otherwise Specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	100	—	—	V	$\text{V}_{\text{GS}} = 0\text{V}, \text{ID} = 1.0\text{ mA}$
$\Delta \text{BV}_{\text{DSS}}/\Delta T_j$	Temperature Coefficient of Breakdown Voltage	—	0.13	—	$\text{V}/^\circ\text{C}$	Reference to 25°C , $\text{ID} = 1.0\text{ mA}$
$\text{R}_{\text{DS(on)}}$	Static Drain-to-Source On-State Resistance	—	—	0.055	Ω	$\text{V}_{\text{GS}} = 10\text{V}, \text{ID} = 24\text{A}$ ④
		—	—	0.065		$\text{V}_{\text{GS}} = 10\text{V}, \text{ID} = 38\text{A}$
$\text{V}_{\text{GS(th)}}$	Gate Threshold Voltage	2.0	—	4.0	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}, \text{ID} = 250\mu\text{A}$
g_{fs}	Forward Transconductance	9	—	—	$\text{S} (\text{t})$	$\text{V}_{\text{DS}} > 15\text{V}, \text{IDS} = 24\text{A}$ ④
ID_{SS}	Zero Gate Voltage Drain Current	—	—	25	μA	$\text{V}_{\text{DS}} = 0.8 \times \text{Max Rating}, \text{V}_{\text{GS}} = 0\text{V}$
		—	—	250		$\text{V}_{\text{DS}} = 0.8 \times \text{Max Rating}$ $\text{V}_{\text{GS}} = 0\text{V}, \text{T}_j = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Leakage Forward	—	—	100	nA	$\text{V}_{\text{GS}} = 20\text{V}$
I_{GSS}	Gate-to-Source Leakage Reverse	—	—	-100		$\text{V}_{\text{GS}} = -20\text{V}$
Q_{g}	Total Gate Charge	50	—	125	nC	$\text{V}_{\text{GS}} = 10\text{V}, \text{ID} = 38\text{A}$
Q_{gs}	Gate-to-Source Charge	8	—	22		$\text{V}_{\text{DS}} = \text{Max. Rating} \times 0.5$ see figures 6 and 13
Q_{gd}	Gate-to-Drain ("Miller") Charge	25	—	65	ns	$\text{V}_{\text{DD}} = 50\text{V}, \text{ID} = 38\text{A},$ $\text{RG} = 2.35\Omega, \text{VGS} = 10\text{V}$ see figure 10
$t_{\text{d(on)}}$	Turn-On Delay Time	—	—	35		
t_{r}	Rise Time	—	—	190		
$t_{\text{d(off)}}$	Turn-Off Delay Time	—	—	170		
t_{f}	Fall Time	—	—	130	nH	Measured from the drain lead, 6mm (0.25 in.) from package to center of die. Measured from the source lead, 6mm (0.25 in.) from package to source bonding pad.
L_{D}	Internal Drain Inductance	—	5.0	—		
L_{S}	Internal Source Inductance	—	13	—		
C_{iss}	Input Capacitance	—	3700	—	pF	$\text{V}_{\text{GS}} = 0\text{V}, \text{V}_{\text{DS}} = 25\text{V}$ $f = 1.0\text{ MHz}$ see figure 5
C_{oss}	Output Capacitance	—	1100	—		
Crss	Reverse Transfer Capacitance	—	200	—		



Source-Drain Diode Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_{S}	Continuous Source Current (Body Diode)	—	—	38	A	Modified MOSFET symbol showing the integral reverse p-n junction rectifier.
I_{SM}	Pulse Source Current (Body Diode) ①	—	—	152		
V_{SD}	Diode Forward Voltage	—	—	1.8	V	$\text{T}_j = 25^\circ\text{C}, \text{I}_{\text{S}} = 38\text{A}, \text{V}_{\text{GS}} = 0\text{V}$ ④
t_{rr}	Reverse Recovery Time	—	—	500	ns	$\text{T}_j = 25^\circ\text{C}, \text{I}_{\text{F}} = 38\text{A}, \text{dI/dt} \leq 100\text{A}/\mu\text{s}$
Q_{RR}	Reverse Recovery Charge	—	—	2.9	μC	$\text{V}_{\text{DD}} \leq 50\text{V}$ ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible. Turn-on speed is substantially controlled by $\text{L}_{\text{S}} + \text{L}_{\text{D}}$.				



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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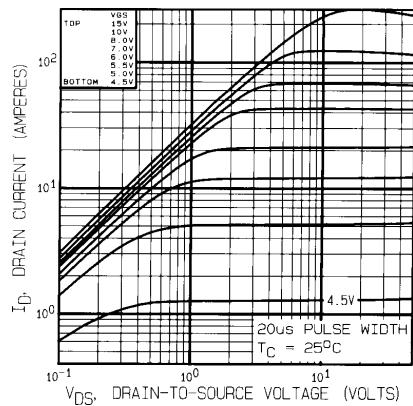


Fig. 1 — Typical Output Characteristics
 $T_c = 25^\circ\text{C}$

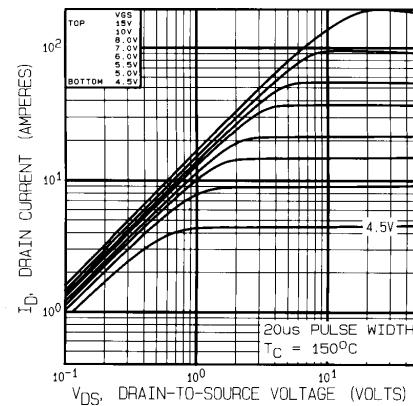


Fig. 2 — Typical Output Characteristics
 $T_c = 150^\circ\text{C}$

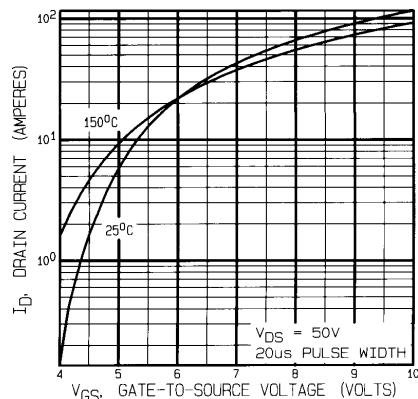


Fig. 3 — Typical Transfer Characteristics

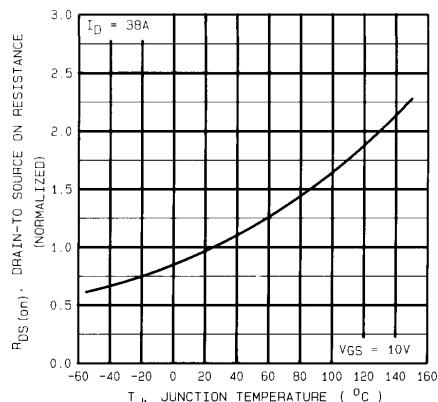


Fig. 4 — Normalized On-Resistance Vs. Temperature

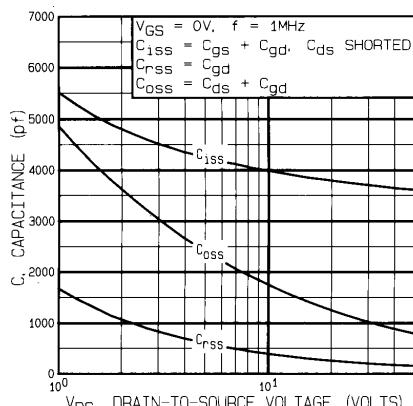


Fig. 5 — Typical Capacitance Vs. Drain-to-Source Voltage

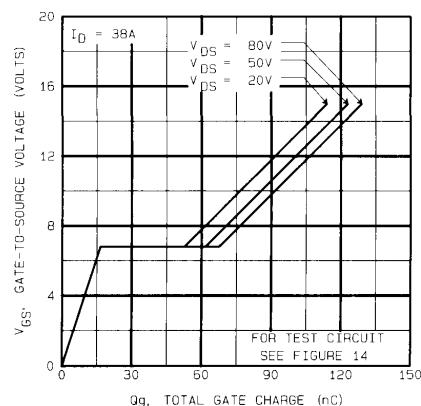


Fig. 6 — Typical Gate Charge Vs. Gate-to-Source Voltage

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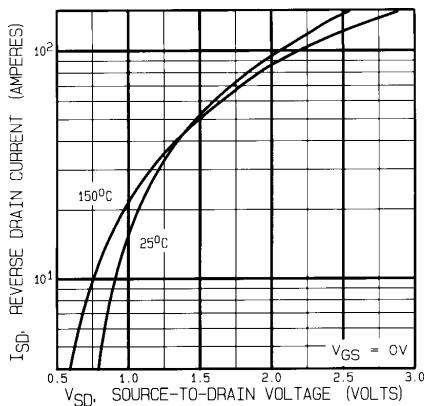


Fig. 7 — Typical Source-to-Drain Diode Forward Voltage

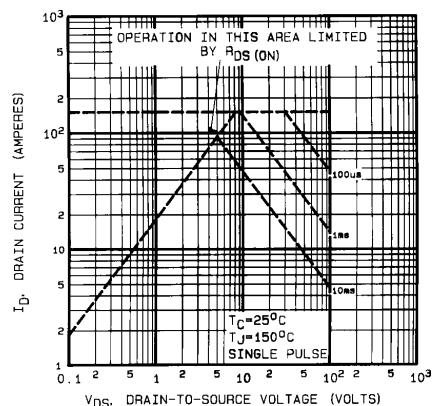


Fig. 8 — Maximum Safe Operating Area

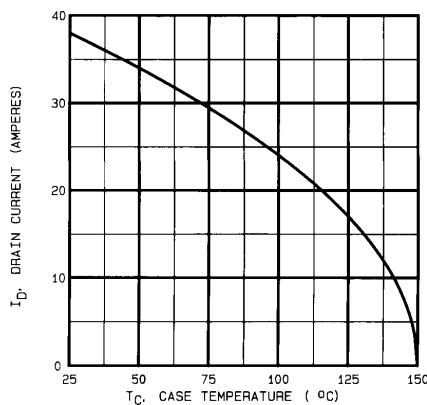


Fig. 9 — Maximum Drain Current Vs. Case Temperature

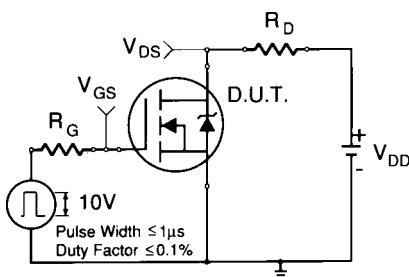


Fig. 10a — Switching Time Test Circuit

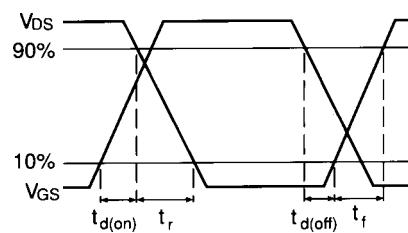


Fig. 10b — Switching Time Waveforms

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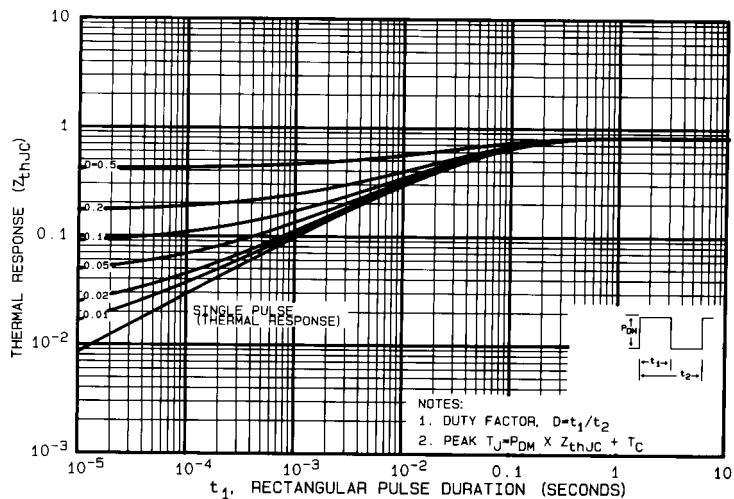


Fig. 11 — Maximum Effective Transient Thermal Impedance, Junction-to-Case Vs. Pulse Duration

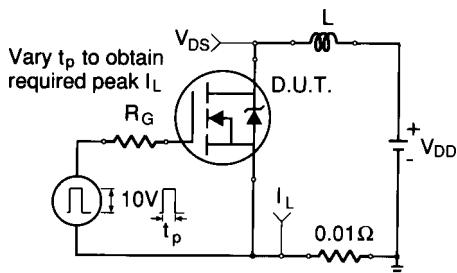


Fig. 12a — Unclamped Inductive Test Circuit

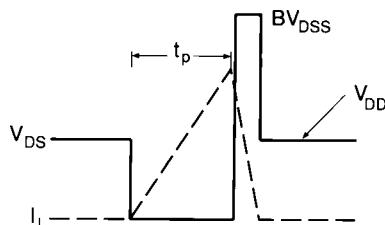


Fig. 12b — Unclamped Inductive Waveforms

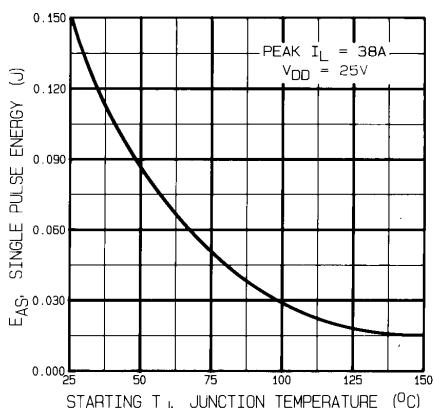


Fig. 12c — Max. Avalanche Energy vs. Current

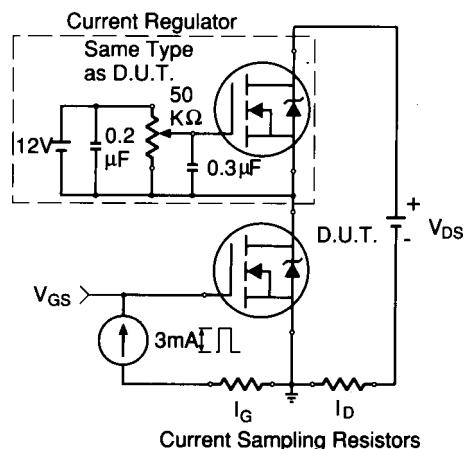


Fig. 12e — Gate Charge Test Circuit

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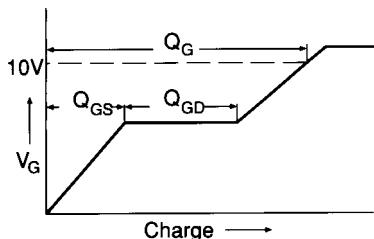
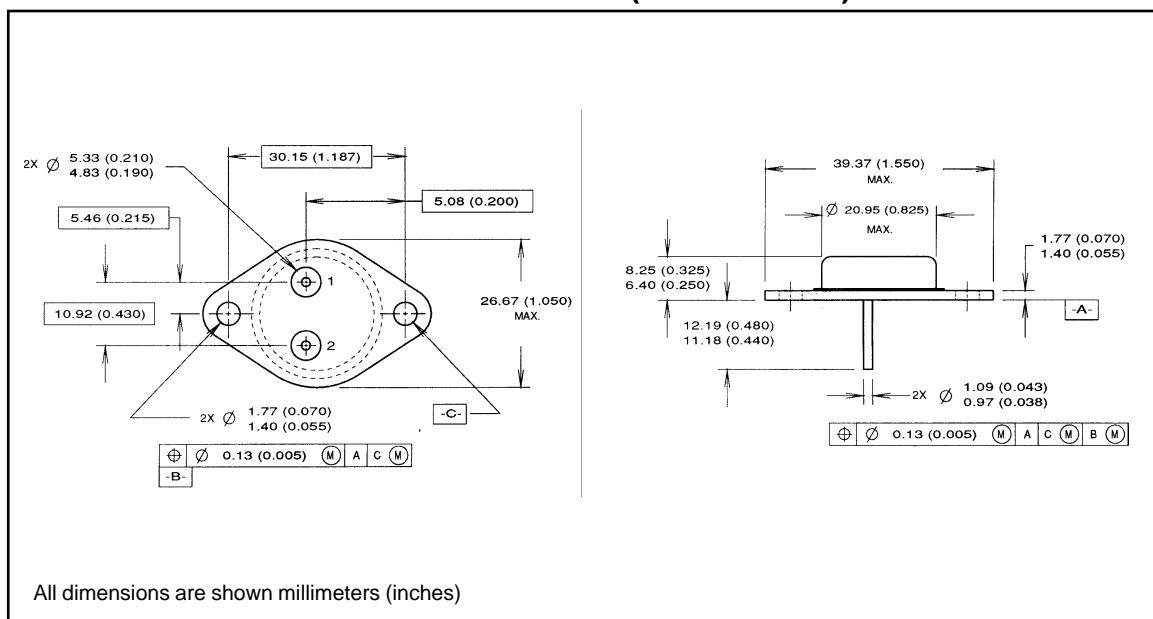


Fig. 13b — Basic Gate Charge Waveform

- ① Repetitive Rating; Pulse width limited by maximum junction temperature.
(see figure 11)
- ② @ $V_{DD} = 25V$, Starting $T_J = 25^\circ C$,
 $EAS = [0.5 * L * (I_c^2) * [BV_{DSS}/(BV_{DSS}-V_{DD})]$
Peak $I_L = 38A$, $V_{GS} = 10V$, $25 \leq R_G \leq 200\Omega$
- ③ $I_{SD} \leq 38A$, $dI/dt \leq 200A/\mu s$,
 $V_{DD} \leq BV_{DSS}$, $T_J \leq 150^\circ C$
- 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

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