

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:

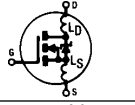
- Avalanche Energy Rating
- Dynamic dv/dt Rating
- Simple Drive Requirements
- Ease of Paralleling
- Hermetically Sealed

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 |
| E _{AS} | 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) | |

JANTX2N6766, JANTXV2N6766 Device

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

| | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|-------------------------------------|--|------|------|-------|-------|--|
| BV _{DSS} | Drain-to-Source Breakdown Voltage | 200 | — | — | V | V _{GS} = 0V, I _D = 1.0 mA |
| ΔBV _{DSS} /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 | — | — | 0.085 | Ω | V _{GS} = 10V, I _D = 19A ④ |
| | On-State Resistance | — | — | 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 |
| g _{fs} | 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 |
| Q _g | Total Gate Charge | 55 | — | 115 | nC | V _{GS} = 10V, I _D = 30A |
| Q _{gs} | Gate-to-Source Charge | 8 | — | 22 | | V _{DS} = Max. Rating x 0.5 |
| Q _{gd} | Gate-to-Drain ("Miller") Charge | 30 | — | 60 | | see figures 6 and 13 |
| t _{d(on)} | Turn-On Delay Time | — | — | 35 | ns | V _{DD} = 100V, I _D = 30A, R _G = 3.5Ω, V _{GS} = 10V |
| t _r | Rise Time | — | — | 190 | | |
| t _{d(off)} | Turn-Off Delay Time | — | — | 170 | | |
| t _f | Fall Time | — | — | 130 | | |
| LD | Internal Drain Inductance | — | 5.0 | — | nH | <p>Measured from the drain lead, 6mm (0.25 in.) from package to center of die.</p> <p>Modified MOSFET symbol showing the internal inductances.</p>  |
| LS | Internal Source Inductance | — | 13 | — | | |
| 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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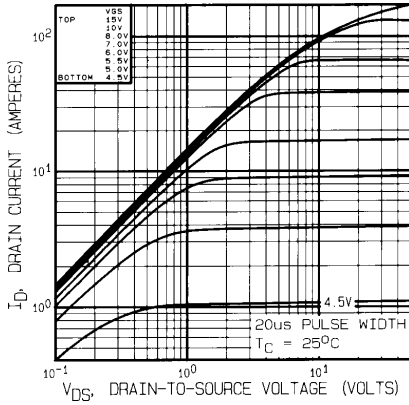


Fig. 1 — Typical Output Characteristics
 $T_C = 25^\circ\text{C}$

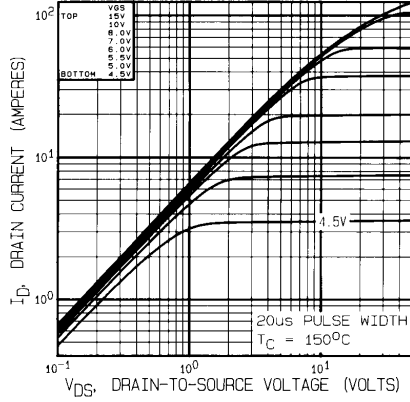


Fig. 2 — Typical Output Characteristics
 $T_C = 150^\circ\text{C}$

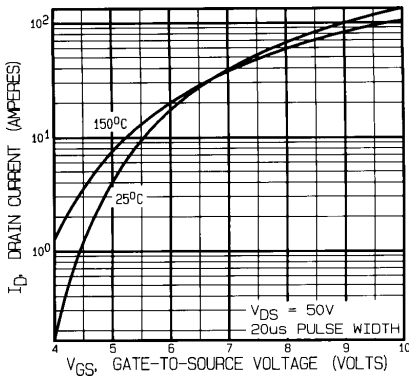


Fig. 3 — Typical Transfer Characteristics

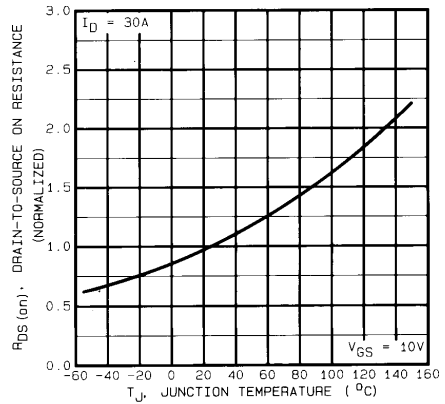


Fig. 4 — Normalized On-Resistance Vs. Temperature

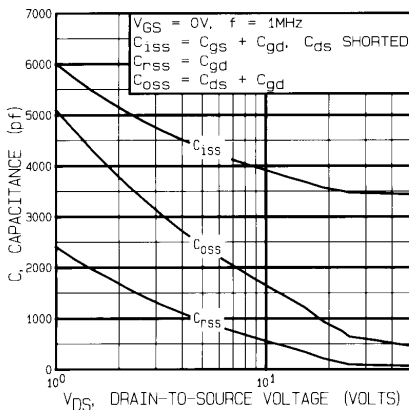


Fig. 5 — Typical Capacitance Vs. Drain-to-Source Voltage

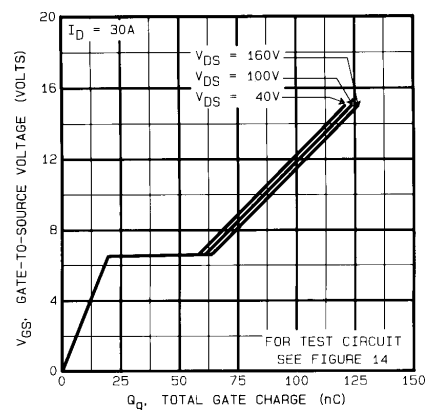


Fig. 6 — Typical Gate Charge Vs. Gate-to-Source Voltage

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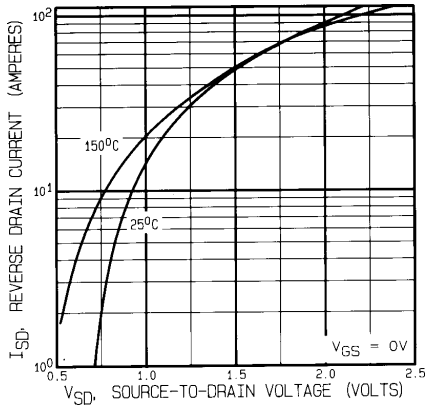


Fig. 7 — Typical Source-to-Drain Diode Forward Voltage

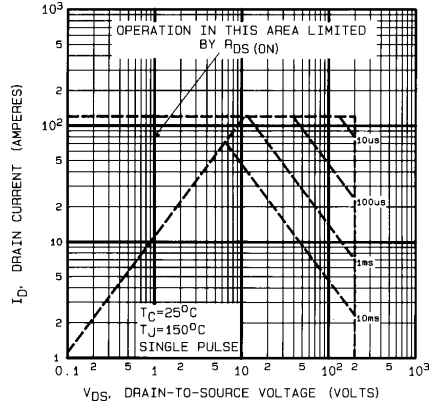


Fig. 8 — Maximum Safe Operating Area

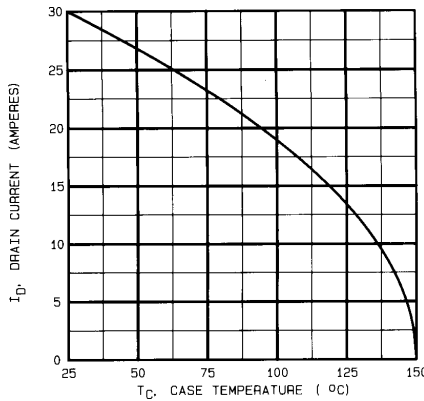


Fig. 9 — Maximum Drain Current Vs. Case Temperature

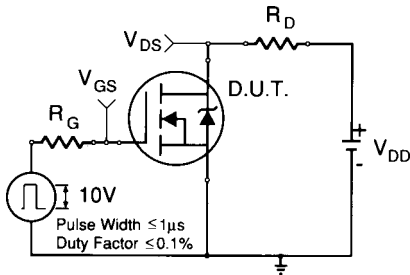


Fig. 10a — Switching Time Test Circuit

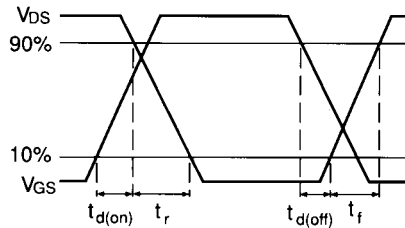


Fig. 10b — Switching Time Waveforms

JANTX2N6766, JANTXV2N6766 Device

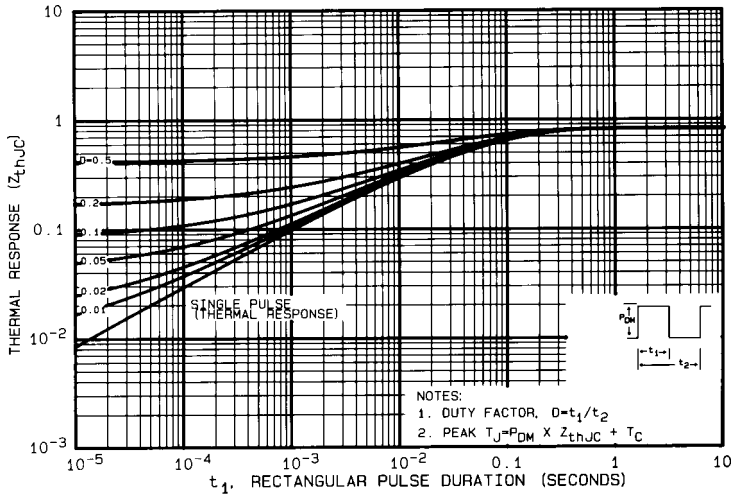


Fig. 11 — Maximum Effective Transient Thermal Impedance, Junction-to-Case Vs. Pulse Duration

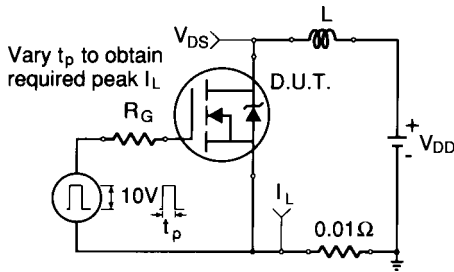


Fig. 12a — Unclamped Inductive Test Circuit

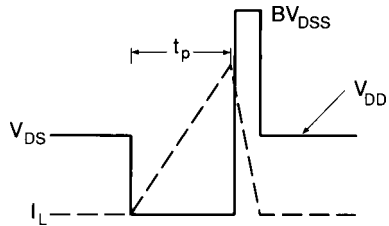


Fig. 12b — Unclamped Inductive Waveforms

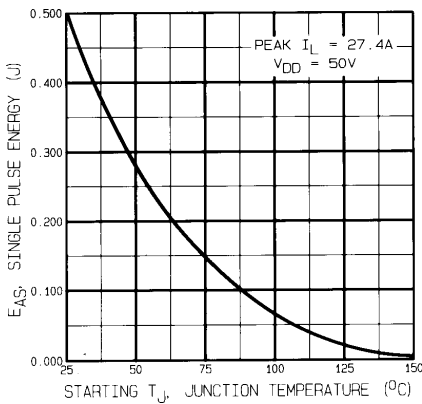


Fig. 12c — Max. Avalanche Energy vs. Current

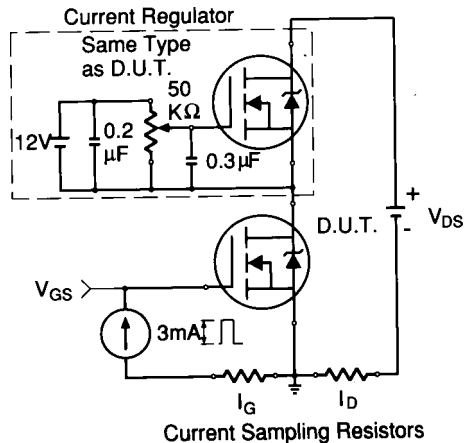


Fig. 13a — Gate Charge Test Circuit

JANTX2N6766, JANTXV2N6766 Device

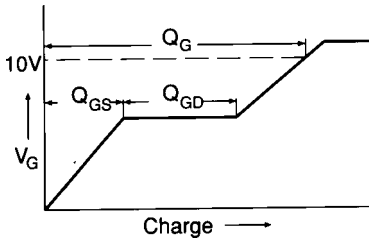
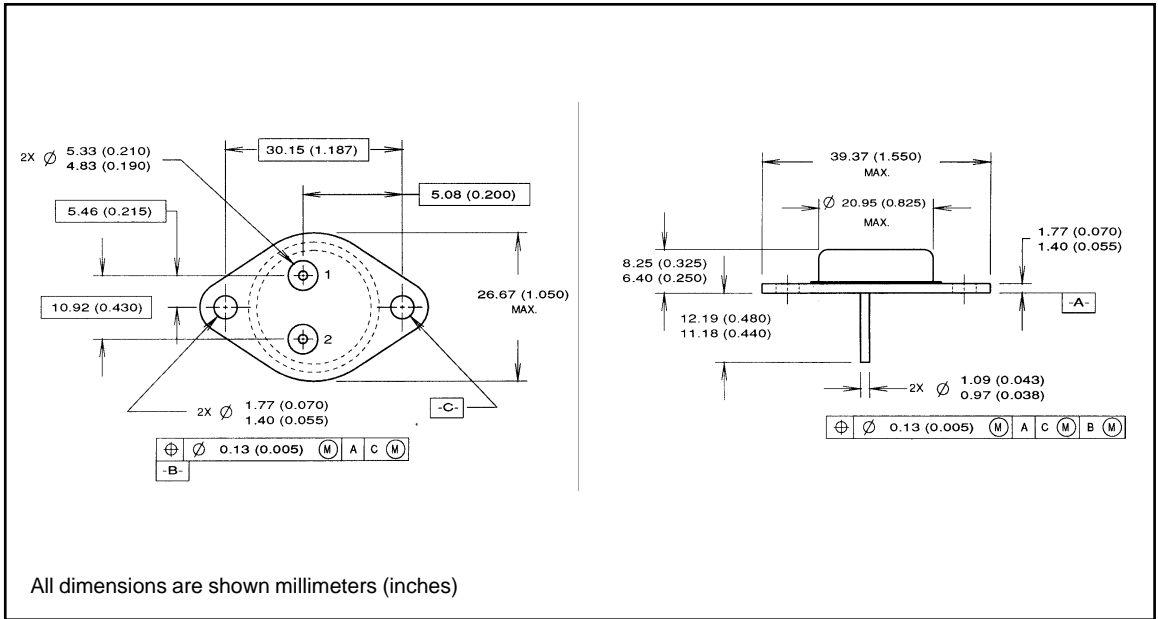


Fig. 13b — Basic Gate Charge Waveform

- 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
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