New Jersey Semi-Conductor Products, Inc.

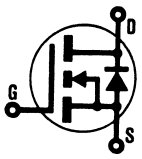
20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

HEXFET® TRANSISTORS

JEDEC REGISTERED N-CHANNEL POWER MOSFETs

*QUALIFIED TO MIL-S-19500/542



***JANTXV2N6756**
***JANTX2N6756**
***JAN2N6756**
2N6756
2N6755

100 Volt, 0.18 Ohm HEXFET

The HEXFET® technology is the key to International Rectifier's advanced line of power MOSFET transistors. The efficient geometry and unique processing of the HEXFET design achieve very low on-state resistance combined with high transconductance and great device ruggedness.

The HEXFET transistors also feature all of the well established advantages of MOSFETs such as voltage control, freedom from second breakdown, very fast switching, ease of paralleling, and temperature stability of the electrical parameters.

They are well suited for applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers, and high energy pulse circuits.

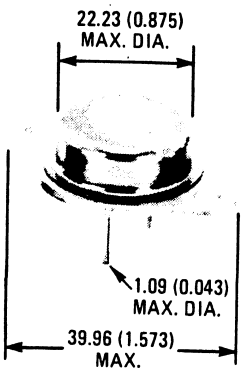
Features:

- Fast Switching
- Low Drive Current
- Ease of Paralleling
- No Second Breakdown
- Excellent Temperature Stability

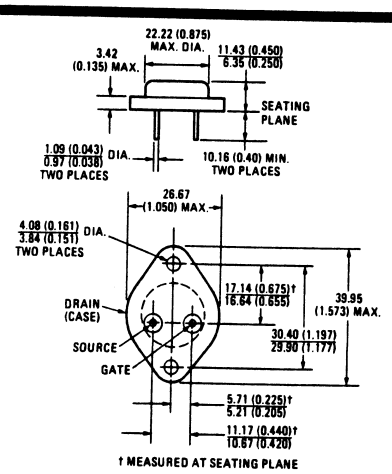
Product Summary

Part Number	V_{DS}	$R_{DS(on)}$	I_D
2N6755	60V	0.25Ω	12A
2N6756	100V	0.18Ω	14A

CASE STYLE AND DIMENSIONS



ACTUAL SIZE



Conforms to JEDEC Outline TO-204AA (TO-3)
Dimensions in Millimeters and (Inches)

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

STATIC

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	2N6755	60			V	V_{GS} = 0, I_D = 1 mA
		2N6756	100			V	
$V_{GS(th)}$	Gate-Threshold Voltage	All	2.0*		4.0*	V	V_{DS} = V_{GS}, I_D = 1 mA
I_{GSSF}	Gate-Body Leakage Forward	All			100*	nA	V_{GS} = 20V
I_{GSSR}	Gate-Body Leakage Reverse	All			−100*	nA	V_{GS} = −20V
I_{DSS}	Zero Gate Voltage Drain Current	All		0.1	1.0*	mA	V_{DS} = Max. Rating, V_{GS} = 0
		All		0.2	4.0*	mA	V_{DS} = Max. Rating, V_{GS} = 0, T_C = 125°C
$I_{D(on)}$	On-State Drain Current[1]	2N6755	12			A	V_{GS} = 10V , V_{DS} = 15V
		2N6756	14			A	V_{GS} = 10V , V_{DS} = 15V
$V_{DS(on)}$	Static Drain-Source On-State Voltage[1]	2N6755			3.0*	V	V_{GS} = 10V , I_D = 12A
		2N6756			2.52*	V	V_{GS} = 10V , I_D = 14A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]	2N6755		0.2	0.25*	Ω	V_{GS} = 10V , I_D = 8.0A
		2N6756		0.14	0.18*	Ω	V_{GS} = 10V , I_D = 9.0A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]	2N6755			0.45*	Ω	V_{GS} =10V, I_D =8.0A, T_C =125°C
		2N6756			0.33*	Ω	V_{GS} =10V, I_D =9.0A, T_C = 125°C

DYNAMIC

g_{fs}	Forward Transductance[1]	All	4.0*	5.5	12.0*	S (℧)	V_{DS} = 15V, I_D = 9.0A
C_{iss}	Input Capacitance	All	350*	600	800*	pF	V_{GS} = 0 , V_{DS} = 25V, f = 1 MHz
C_{oss}	Output Capacitance	All	150*	300	500*	pF	
C_{rss}	Reverse Transfer Capacitance	All	50*	100	150*	pF	
$t_{d(on)}$	Turn-On Delay Time	All			30*	ns	V_{DD} = 36V , I_D ≅ 9.0A, R_g = 7.5Ω , R_L = 4.0Ω (MOSFET switching times are essentially independent of operating temperature.)
t_r	Rise Time	All			75*	ns	
$t_{d(off)}$	Turn-Off Delay Time	All			40*	ns	
t_f	Fall Time	All			45*	ns	

THERMAL RESISTANCE

R_{thJC}	Junction-to-Case	All			1.67*	°C/W	
R_{thJA}	Junction-to-Ambient	All			30	°C/W	Free Air Operation

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

I_S	Continuous Source Current (Body Diode)	2N6755			−12*	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier
		2N6756			−14*	A	
I_{SM}	Source Current[1] (Body Diode)	2N6755			−25	A	
		2N6756			−30	A	
V_{SD}	Diode Forward Voltage[1]	2N6755	−0.85*		−1.7*	V	T_C = 25°C, I_S = −12A, V_{GS} = 0
		2N6756	−0.9*		−1.8*	V	T_C = 25°C, I_S = 14A , V_{GS} = 0
t_{rr}	Reverse Recovery Time	All		300		ns	T_J =150°C, I_F = I_S, dI_F/dt = 100 A/μs

1 Pulse Test: Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%
* JEDEC Registered Values

Data Sheet Curves: VNDE10

JANTXV-, JANTX-, JAN-, 2N6756 and 2N6755 Devices

Absolute Maximum Ratings

Parameter		2N6755	2N6756	Units
V_{DS}	Drain – Source Voltage	60*	100*	V
V_{DGR}	Drain – Gate Voltage (R_{GS} = 1 MΩ)	60*	100*	V
I_D @ T_C = 25°C	Continuous Drain Current	12*	14*	A
I_D @ T_C = 100°C	Continuous Drain Current	8.0*	9.0*	A
I_{DM}	Pulsed Drain Current	25	30	A
V_{GS}	Gate – Source Voltage	±20*		V
P_D @ T_C = 25°C	Max. Power Dissipation	75* (See Fig. 11)		W
P_D @ T_C = 100°C	Max. Power Dissipation	30* (See Fig. 11)		W
	Linear Derating Factor	0.6* (See Fig. 11)		W/K
I_{LM}	Inductive Current, Clamped	(See Fig. 1 and 2) L = 100 μH		A
		25	30	
T_J T_{stg}	Operating and Storage Temperature Range	-55* to 150*		°C
	Lead Temperature	300* (0.063 in. (1.6mm) from case for 10s)		°C

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

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain – Source Breakdown Voltage	2N6755	60	–	–	V	V_{GS} = 0
		2N6756	100	–	–	V	I_D = 1.0 mA
$V_{GS(th)}$	Gate Threshold Voltage	ALL	2.0*	–	4.0*	V	V_{DS} = V_{GS}, I_D = 1 mA
I_{GSSF}	Gate – Body Leakage Forward	ALL	–	–	100*	nA	V_{GS} = 20V
I_{GSSR}	Gate – Body Leakage Reverse	ALL	–	–	100*	nA	V_{GS} = -20V
I_{DSS}	Zero Gate Voltage Drain Current	ALL	–	0.1	1.0*	mA	V_{DS} = Max. Rating, V_{GS} = 0
			–	0.2	4.0*	mA	V_{DS} = Max. Rating, V_{GS} = 0, T_C = 125°C
$V_{DS(on)}$	Static Drain-Source On-State Voltage ①	2N6755	–	–	3.0*	V	V_{GS} = 10V, I_D = 12A
		2N6756	–	–	2.52*	V	V_{GS} = 10V, I_D = 14A
$R_{DS(on)}$	Static Drain-Source On-State Resistance ①	2N6755	–	0.20	0.25*	Ω	V_{GS} = 10V, I_D = 8A
		2N6756	–	0.14	0.18*	Ω	V_{GS} = 10V, I_D = 9A
$R_{DS(on)}$	Static Drain-Source On-State Resistance ①	2N6755	–	–	0.45*	Ω	V_{GS} = 10V, I_D = 8A, T_C = 125°C
		2N6756	–	–	0.33*	Ω	V_{GS} = 10V, I_D = 9A, T_C = 125°C
g_{fs}	Forward Transconductance ①	ALL	4.0*	5.5	12.0*	S (℧)	V_{DS} = 15V, I_D = 9A
C_{iss}	Input Capacitance	ALL	350*	600	800*	pF	V_{GS} = 0, V_{DS} = 25V, f = 1.0 MHz See Fig. 10
C_{oss}	Output Capacitance	ALL	150*	300	500*	pF	
C_{rss}	Reverse Transfer Capacitance	ALL	50*	100	150*	pF	
$t_{d(on)}$	Turn-On Delay Time	ALL	–	–	30*	ns	V_{DD} ≅ 36V, I_D = 9A, Z_o = 15Ω (See Figs. 13 and 14) (MOSFET switching times are essentially independent of operating temperature.)
t_r	Rise Time	ALL	–	–	75*	ns	
$t_{d(off)}$	Turn-Off Delay Time	ALL	–	–	40*	ns	
t_f	Fall Time	ALL	–	–	45*	ns	

Thermal Resistance

R_{thJC}	Junction-to-Case	ALL	–	–	1.67*	K/W	
R_{thCS}	Case-to-Sink	ALL	–	0.1	–	K/W	Mounting surface flat, smooth, and greased.
R_{thJA}	Junction-to-Ambient	ALL	–	–	30	K/W	Free Air Operation

Body-Drain Diode Ratings and Characteristics

I_S	Continuous Source Current (Body Diode)	2N6755	–	–	12*	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier.
		2N6756	–	–	14*		
I_{SM}	Pulsed Source Current (Body Diode)	2N6755	–	–	25	A	
		2N6756	–	–	30		
V_{SD}	Diode Forward Voltage ①	2N6755	0.85*	–	1.7*	V	T_C = 25°C, I_S = 12A, V_{GS} = 0
		2N6756	0.90*	–	1.8*	V	T_C = 25°C, I_S = 14A, V_{GS} = 0
t_{rr}	Reverse Recovery Time	ALL	–	300	–	ns	T_J = 150°C, I_F = I_{SM}, dI_F/dt = 100 A/μs
Q_{RR}	Reverse Recovered Charge	ALL	–	4.0	–	μC	T_J = 150°C, I_F = I_{SM}, dI_F/dt = 100 A/μs

*JEDEC registered values. ① Pulse Test: Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%

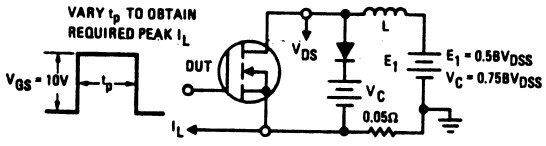


Fig. 1 – Clamped Inductive Test Circuit

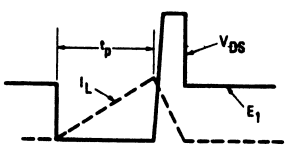


Fig. 2 – Clamped Inductive Waveforms