2N6796, JANTX2N6796 JANTXV2N6796
2N6798, JANTX2N6798 JANTXV2N6798

2N6800, JANTX2N6800, JANTXV2N6800
2N6802, JANTX2N6802, JANTXV2N6802

JANTX, JANTXV POWER MOSFET IN TO-205 AF PACKAGE, QUALIFIED TO MIL-PRF-19500/557

100 V, 200 V, 400 V & 500 V, N-Channel,
Enhancement Mode MOSFET Power Transistor

FEATURES

- Low $R_{DS(on)}$
- Ease of Paralleling
- Qualified to MIL-PRF-19500/557

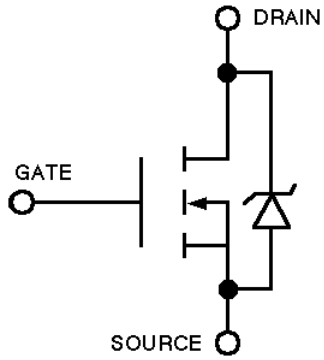
DESCRIPTION

This hermetically packaged QPL product features the latest advanced MOSFET technology. It is ideally suited for Military requirements where small size, high performance and high reliability are required, and in applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers and high energy pulse circuits.

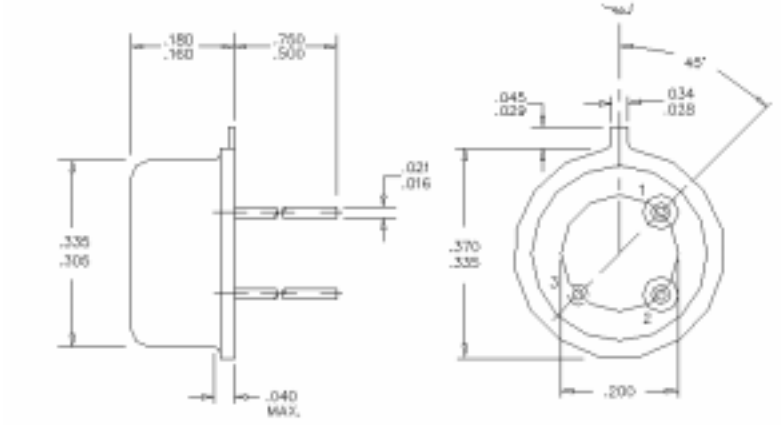
PRIMARY ELECTRICAL CHARACTERISTICS @ T_C = 25 C

PART NUMBER	V_{DS}, Volts	$R_{DS(on)}$	I_D, Amps
2N6796	100	.18	8.0
2N6798	200	.40	5.5
2N6800	400	1.00	3.0
2N6802	500	1.50	2.5

SCHEMATIC



MECHANICAL OUTLINE



Pin Connection
Pin 1: Source
Pin 2: Gate
Pin 3: Drain
(Case)

Omnirel 205 Crawford Street, Leominster, MA 01453 USA (508) 534-5776 FAX (508) 537-4246

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted

Parameter		JANTXV, JANTX, 2N6796	Units
I_D @ V_{GS} = 10V, T_C = 25°C	Continuous Drain Current	8.0	A
I_D @ V_{GS} = 10V, T_C = 100°C	Continuous Drain Current	5.0	A
I_{DM}	Pulsed Drain Current[1]	32	A
P_D @ T_C = 25°C	Maximum Power Dissipation	25	W
	Linear Derating Factor	0.2	W/°C
V_{GS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy [2]	4.3 [4]	mJ
T_J T_{STG}	Operating Junction Storage Temperature Range	-55 to 150	°C
	Lead Temperature	300(.06 from case for 10 sec)	°C

ELECTRICAL CHARACTERISTICS @ T_J = 25°C (Unless Otherwise Specified)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	100			V	V_{GS} = 0V, I_D = 1.0 mA,
$R_{DS(on)}$	Static Drain-to-Source On-State Resistance	–	–	.18		V_{GS} = 10 V, I_D = 5.0 A [3]
		–	–	.195		V_{GS} = 10 V, I_D = 8.0 A [3]
$V_{GS(th)}$	Gate Threshold Voltage	2.0	–	4.0	V	V_{DS} = V_{GS}, I_D = 250 µA
I_{DSS}	Zero Gate Voltage Drain Current	–	–	25	µA	V_{DS} = 80 V, V_{GS} = 0V
		–	–	250		V_{DS} = 80 V, V_{GS} = 0V, T_J = 125 °C
I_{GSS}	Gate -to-Source Leakage Forward	–	–	100	nA	V_{GS} = 20 V
I_{GSS}	Gate -to-Source Leakage Reverse	–	–	-100	nA	V_{GS} = -20 V
$Q_{G(on)}$	On-state Gate Charge	–	–	28.5	nC	V_{GS} = 10 V, I_D = 8A
Q_{GS}	Gate-to-Source Charge	–	–	6.3	nC	V_{DS} = 50 V
Q_{Gd}	Gate-to-Drain ("Miller") Charge	–	–	16.6	nC	See note 4
$t_{d(on)}$	Turn-On Delay Time	–	–	30	ns	V_{DD} = 30 V, I_D = 5.0 A, R_G = 7.5
t_r	Rise Time	–	–	75	ns	See note 4
$t_{d(off)}$	Turn-Off Delay Time	–	–	40	ns	
t_f	Fall Time	–	–	45	ns	

Source-Drain Diode Ratings and Characteristics

Parameter		Min.	Typ.	Max.	Units	Test Conditions
V_{SD}	Diode Forward Voltage	–	–	1.5	V	T_J = 25°C, I_S = 8.0A [3], V_{GS} = 0 V [3]
t_{rr}	Reverse Recovery Time	–	–	300	ns	T_J = 25°C, I_F = 8.0 A, di/dt ≤ 100 A/µs

[3]

Thermal Resistance

Parameter		Min.	Typ.	Max.	Units	Test Conditions
R_{thJC}	Junction-to-Case	–	–	5.0	°C/W	Mounting surface flat, smooth, and greased
R_{thCS}	Case-to-sink	–	0.21	–		
R_{thJA}	Junction-to-Ambient	–	–	175		Typical socket mount

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. @V_{DD} = 25 V, Starting T_J = 25 °C, L = 100 µH ± 10%, R_G = 25 , Peak I_L = 8.0 A
3. Pulse width ≤ 300 µs; Duty Cycle ≤ 2 %
4. See MIL-S-19500/557

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted

Parameter		JANTXV, JANTX, 2N6798	Units
I_D @ V_{GS} = 10V, T_C = 25°C	Continuous Drain Current	5.5	A
I_D @ V_{GS} = 10V, T_C = 100°C	Continuous Drain Current	3.5	A
I_{DM}	Pulsed Drain Current [1]	22	A
P_D @ T_C = 25°C	Maximum Power Dissipation	25	W
	Linear Derating Factor	0.2	W/°C
V_{GS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy [2]	2.0 [4]	mJ
T_J T_{STG}	Operating Junction Storage Temperature Range	-55 to 150	°C
	Lead Temperature	300(.06 from case for 10 sec)	°C

ELECTRICAL CHARACTERISTICS @ T_J = 25°C (Unless Otherwise Specified)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	200			V	V_{GS} = 0V, I_D = 1.0 mA,
$R_{DS(on)}$	Static Drain-to-Source On-State Resistance	–	–	.40		V_{GS} = 10 V, I_D = 3.5 A [3]
		–	–	.42		V_{GS} = 10 V, I_D = 5.5 A [3]
$V_{GS(th)}$	Gate Threshold Voltage	2.0	–	4.0	V	V_{DS} = V_{GS}, I_D = 250 µA
I_{DSS}	Zero Gate Voltage Drain Current	–	–	25	µA	V_{DS} = 160 V, V_{GS} = 0V
		–	–	250		V_{DS} = 160 V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate -to-Source Leakage Forward	–	–	100	nA	V_{GS} = 20 V
I_{GSS}	Gate -to-Source Leakage Reverse	–	–	-100	nA	V_{GS} = -20 V
$Q_{G(on)}$	On-state Gate Charge	–	–	42.1	nC	V_{GS} = 10 V, I_D = 5.5 A
Q_{GS}	Gate-to-Source Charge	–	–	5.3	nC	V_{DS} = 100 V
Q_{Gd}	Gate-to-Drain ("Miller") Charge	–	–	28.1	nC	See note 4
$t_{d(on)}$	Turn-On Delay Time	–	–	30	ns	V_{DD} = 77 V, I_D = 3.5 A, R_G = 7.5
t_r	Rise Time	–	–	50	ns	See note 4
$t_{d(off)}$	Turn-Off Delay Time	–	–	50	ns	
t_f	Fall Time	–	–	40	ns	

Source-Drain Diode Ratings and Characteristics

Parameter		Min.	Typ.	Max.	Units	Test Conditions
V_{SD}	Diode Forward Voltage	–	–	1.4	V	T_J = 25°C, I_S = 5.5 A [3], V_{GS} = 0 V [3]
t_{rr}	Reverse Recovery Time	–	–	500	ns	T_J = 25°C, I_F = 5.5 A, di/dt ≤ 100 A/µs [3]

Thermal Resistance

Parameter		Min.	Typ.	Max.	Units	Test Conditions
R_{thJC}	Junction-to-Case	–	–	5.0	°C/W	Mounting surface flat, smooth, and greased
R_{thCS}	Case-to-sink	–	0.21	–		
R_{thJA}	Junction-to-Ambient	–	–	175		Typical socket mount

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. @V_{DD} = 50 V, Starting T_J = 25°C, L = 100 µH ± 10%, R_G = 25 , Peak I_L = 5.5 A
3. Pulse width ≤ 300 µs; Duty Cycle ≤ 2 %
4. See MIL-S-19500/557

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted

Parameter		JANTXV, JANTX, 2N6800	Units
I_D @ V_{GS} = 10V, T_C = 25°C	Continuous Drain Current	3.0	A
I_D @ V_{GS} = 10V, T_C = 100°C	Continuous Drain Current	2.0	A
I_{DM}	Pulsed Drain Current[1]	14	A
P_D @ T_C = 25°C	Maximum Power Dissipation	25	W
	Linear Derating Factor	0.2	W/°C
V_{GS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy [2]	0.51 [4]	mJ
T_J T_{STG}	Operating Junction Storage Temperature Range	-55 to 150	°C
	Lead Temperature	300(.06 from case for 10 sec)	°C

ELECTRICAL CHARACTERISTICS @ T_J = 25°C (Unless Otherwise Specified)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	400			V	V_{GS} = 0V, I_D = 1.0 mA,
$R_{DS(on)}$	Static Drain-to-Source On-State Resistance	–	–	1.0		V_{GS} = 10 V, I_D = 2.0 A [3]
		–	–	1.10		V_{GS} = 10 V, I_D = 3.0 A [3]
$V_{GS(th)}$	Gate Threshold Voltage	2.0	–	4.0	V	V_{DS} = V_{GS}, I_D = 250 µA
I_{DSS}	Zero Gate Voltage Drain Current	–	–	25	µA	V_{DS} = 320 V, V_{GS} = 0V
		–	–	250		V_{DS} = 320 V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate -to-Source Leakage Forward	–	–	100	nA	V_{GS} = 20 V
I_{GSS}	Gate -to-Source Leakage Reverse	–	–	-100	nA	V_{GS} = -20 V
$Q_{g(on)}$	On-state Gate Charge	–	–	33	nC	V_{GS} = 10 V, I_D = 3.0A
Q_{GS}	Gate-to-Source Charge	–	–	5.8	nC	V_{DS} = 200 V
Q_{Gd}	Gate-to-Drain ("Miller") Charge	–	–	16.6	nC	See note 4
$t_{d(on)}$	Turn-On Delay Time	–	–	30	ns	V_{DD} = 176 V, I_D = 2 A, R_G = 7.5
t_r	Rise Time	–	–	35	ns	See note 4
$t_{d(off)}$	Turn-Off Delay Time	–	–	55	ns	
t_f	Fall Time	–	–	35	ns	

Source-Drain Diode Ratings and Characteristics

Parameter		Min.	Typ.	Max.	Units	Test Conditions
V_{SD}	Diode Forward Voltage	–	–	1.4	V	T_J = 25°C, I_S = 3 A [3], V_{GS} = 0 V
t_{rr}	Reverse Recovery Time	–	–	700	ns	T_J = 25°C, I_F = 3.0 A, di/dt ≤ 100A/µs [3]

Thermal Resistance

Parameter		Min.	Typ.	Max.	Units	Test Conditions
R_{thJC}	Junction-to-Case	–	–	5.0	°C/W	Mounting surface flat, smooth, and greased
R_{thCS}	Case-to-sink	–	0.21	–		
R_{thJA}	Junction-to-Ambient	–	–	175		Typical socket mount

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. @V_{DD} = 50 V, Starting T_J = 25°C, L = 100 µH ± 10%, R_G = 25 , Peak I_L = 3.0 A
3. Pulse width ≤ 300 µs; Duty Cycle ≤ 2 %
4. See MIL-S-19500/557

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted

Parameter		JANTXV, JANTX, 2N6802	Units
I_D @ V_{GS} = 10V, T_C = 25°C	Continuous Drain Current	2.5	A
I_D @ V_{GS} = 10V, T_C = 100°C	Continuous Drain Current	1.5	A
I_{DM}	Pulsed Drain Current[1]	11	A
P_D @ T_C = 25°C	Maximum Power Dissipation	25	W
	Linear Derating Factor	0.20	W/°C
V_{GS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy [2]	.35 [4]	mJ
T_J T_{STG}	Operating Junction Storage Temperature Range	-55 to 150	°C
	Lead Temperature	300 (.06 from case for 10 sec)	°C

ELECTRICAL CHARACTERISTICS @ T_J = 25°C (Unless Otherwise Specified)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	500			V	V_{GS} = 0V, I_D = 1.0 mA,
$R_{DS(on)}$	Static Drain-to-Source On-State Resistance	–	–	1.5		V_{GS} = 10 V, I_D = 1.5 A [3]
		–	–	1.6		V_{GS} = 10 V, I_D = 2.5 A [3]
$V_{GS(th)}$	Gate Threshold Voltage	2.0	–	4.0	V	V_{DS} = V_{GS}, I_D = 250 µA
I_{DSS}	Zero Gate Voltage Drain Current	–	–	25	µA	V_{DS} = 400 V, V_{GS} = 0V
		–	–	250		V_{DS} = 400 V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate -to-Source Leakage Forward	–	–	100	nA	V_{GS} = 20 V
I_{GSS}	Gate -to-Source Leakage Reverse	–	–	-100	nA	V_{GS} = -20 V
$Q_{G(on)}$	On-state Gate Charge	–	–	29.5	nC	V_{GS} = 10 V, I_D = 2.5 A
Q_{GS}	Gate-to-Source Charge	–	–	4.5	nC	V_{DS} = 250 V
Q_{Gd}	Gate-to-Drain ("Miller") Charge	–	–	28.1	nC	See note 4
$t_{d(on)}$	Turn-On Delay Time	–	–	30	ns	V_{DD} = 225 V, I_D = 1.5 A, R_G = 7.5
t_r	Rise Time	–	–	30	ns	See note 4
$t_{d(off)}$	Turn-Off Delay Time	–	–	55	ns	
t_f	Fall Time	–	–	30	ns	

Source-Drain Diode Ratings and Characteristics

Parameter		Min.	Typ.	Max.	Units	Test Conditions
V_{SD}	Diode Forward Voltage	–	–	1.4	V	T_J = 25°C, I_S = 2.5 A [3], V_{GS} = 0 V
t_{rr}	Reverse Recovery Time	–	–	900	ns	T_J = 25°C, I_F = 2.5 A, di/dt ≤ 100A/µs [3]

Thermal Resistance

Parameter		Min.	Typ.	Max.	Units	Test Conditions
R_{thJC}	Junction-to-Case	–	–	5.0	°C/W	Mounting surface flat, smooth, and greased
R_{thCS}	Case-to-sink	–	0.21	–		
R_{thJA}	Junction-to-Ambient	–	–	175		Typical socket mount

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. @V_{DD} = 50 V, Starting T_J = 25°C, L = 100 uH ± 10%, R_G = 25 , Peak I_L = 2.5 A
3. Pulse width ≤ 300 µs; Duty Cycle ≤ 2 %
4. See MIL-S-19500/557