



IXTP4N80, IXTP4N90, IXTM4N80, IXTM4N90

4 AMPS, 800-900 V, 2.4Ω/3.0Ω

T-39-13

MAXIMUM RATINGS

Parameter	Sym.	IXTP4N80 IXTM4N80	IXTP4N90 IXTM4N90	Unit
Drain-Source Voltage (1)	V_{DSS}	800	900	V_{dc}
Drain-Gate Voltage ($R_{GS}=1.0\text{ M}\Omega$) (1)	V_{DGR}	800	900	V_{dc}
Gate-Source Voltage Continuous	V_{GS}	± 20		V_{dc}
Gate-Source Voltage Transient	V_{GSM}	± 30		V
Drain Current Continuous ($T_C=25^\circ\text{C}$)	I_D	4		A_{dc}
Drain Current Pulsed (3)	I_{DM}	16		A
Total Power Dissipation	P_D	125		W
Power Dissipation Derating $>25^\circ\text{C}$		1.0		W/ $^\circ\text{C}$
Operating and Storage Temperature	T_J & T_{stg}	- 65 to + 150		$^\circ\text{C}$
Max. Lead Temp. for Soldering	T_L	300 (1.6mm from case for 10 sec.)		$^\circ\text{C}$

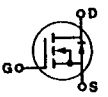
ELECTRICAL CHARACTERISTICS $T_C=25^\circ\text{C}$ unless otherwise specified

Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS} Drain-Source Breakdown Voltage	4N80, 80A	800	—	—	V	$V_{GS}=0V$
	4N90, 90A	900	—	—	V	$I_D=250\mu A$
$V_{GS(th)}$ Gate Threshold Voltage	ALL	2.0	—	4.5	V	$V_{DS}=V_{GS}$, $I_D=250\mu A$
I_{GSS} Gate-Source Leakage Forward	ALL	—	—	100	nA	$V_{GS}=20V$
I_{GSS} Gate-Source Leakage Reverse	ALL	—	—	100	nA	$V_{GS}=-20V$
I_{DSS} Zero Gate Voltage Drain Current	ALL	—	—	200	μA	$V_{DS}=\text{Max. Rating} \times 0.8$, $V_{GS}=0V$
		—	—	1000	μA	$V_{DS}=\text{Max. Rating} \times 0.8$, $V_{GS}=0V$, $T_C=125^\circ\text{C}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance (2)	4N80A, 90A	—	—	2.4	Ω	$V_{GS}=10V$, $I_D=2.0A$
	4N80, 90	—	—	3.0	Ω	
G_{fs} Forward Transconductance (2)	ALL	4.0	5.0	—	S	$V_{DS} \geq 15V$, $I_D=2.0A$
C_{iss} Input Capacitance	ALL	—	1500	1800	pF	$V_{GS}=0V$, $V_{DS}=25V$, $f=1.0\text{ MHz}$
C_{oss} Output Capacitance	ALL	—	110	165	pF	
C_{rss} Reverse Transfer Capacitance	ALL	—	35	70	pF	
$t_{d(on)}$ Turn-On Delay Time	ALL	—	20	40	ns	$V_{DS}=0.5 BV_{DSS}$, $I_D=2.0A$, $Z_o=10\Omega$ (MOSFET switching times are essentially independent of operating temperature. See Fig. 3, page 22 for test circuit.)
t_r Rise Time	ALL	—	30	60	ns	
$t_{d(off)}$ Turn-Off Delay Time	ALL	—	70	100	ns	
t_f Fall Time	ALL	—	35	60	ns	
Q_g Total Gate Charge	ALL	—	—	80	nC	$V_{GS}=10V$, $I_D=4.0A$, $V_{DS}=0.8\text{ Max. Rating}$. (Gate charge is essentially independent of operating temperature. See Fig. 4, page 22 for test circuit.)
Q_{gs} Gate-Source Charge	ALL	—	—	15	nC	
Q_{gd} Gate-Drain ("Miller") Charge	ALL	—	—	20	nC	
W_{DSR} Unclamped Drain-to-Source Avalanche Energy	4N80R, 80AR	250	—	—	mJ	See Fig. 5, page 22 for test circuit.
	4N90R, 90AR					

THERMAL RESISTANCE

R_{thJC} Junction-to-Case	ALL	—	—	1.0	$^\circ\text{C/W}$	
R_{thJA} Junction-to-Ambient TO-204	IXTM	—	—	30.0	$^\circ\text{C/W}$	Free Air Operation
R_{thJA} Junction-to-Ambient TO-220	IXTP	—	—	80.0	$^\circ\text{C/W}$	Free Air Operation

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

I_S Continuous Source Current (Body Diode)	ALL	—	—	4.0	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier. 
I_{SM} Pulse Source Current (Body Diode) (1)	ALL	—	—	16.0	A	
V_{SD} Diode Forward Voltage (2)	ALL	—	—	1.5	V	$T_C=25^\circ\text{C}$, $I_f=4.0A$, $V_{GS}=0V$
t_{rr} Reverse Recovery Time	ALL	—	800	—	ns	$I_f=4.0A$, $di/dt=100A/\mu s$

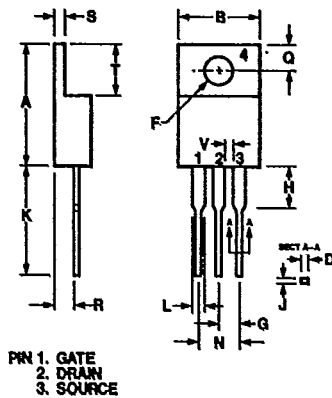
(1) $T_J=25^\circ\text{C}$ to 150°C (2) Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

(3) Repetitive rating: Pulse width limited by max. junction temperature.

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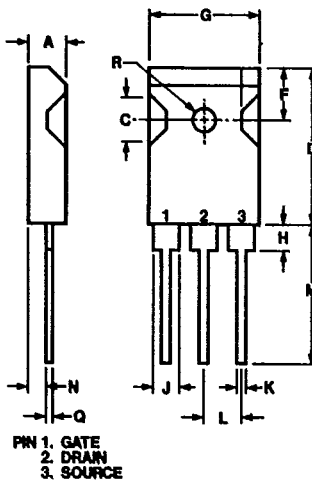
PACKAGE OUTLINES AND PINOUTS

TO-220 AB



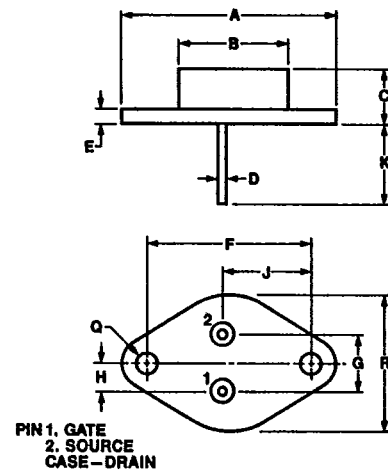
Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	14.23	16.51	.560	.650
B	9.66	10.66	.380	.420
C	3.56	4.82	.140	.190
D	0.64	0.89	.025	.035
F	3.54	4.08	.139	.161
G	2.29	2.79	.090	.110
H	—	6.35	—	.250
J	0.51	.76	.020	.030
K	12.70	14.73	.500	.580
L	1.15	1.77	.045	.070
N	4.83	5.33	.190	.210
Q	2.54	3.42	.100	.135
R	2.04	2.49	.080	.115
S	0.64	1.39	.025	.055
T	5.85	6.85	.230	.270
V	1.15	—	.045	—

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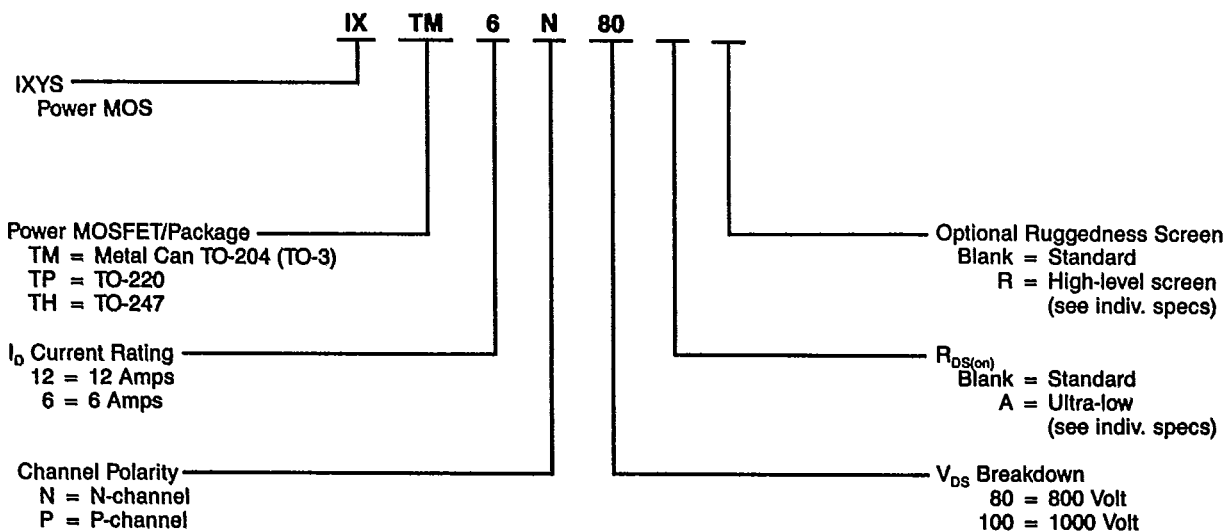
Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
C	4.5	6.0	.178	.236
D	19.7	21.4	.776	.843
F	5.3	6.1	.209	.240
G	15.3	15.9	.602	.625
H	3.7	4.3	.146	.169
J	1.95	2.4	.077	.094
J ₁	2.97	3.4	.117	.134
K	1.0	1.4	.040	.055
L	5.4	5.5	.213	.217
M	19.9	20.2	.783	.795
N	2.2	2.6	.087	.102
Q	0.4	0.8	.016	.031
R	2.9	3.3	.114	.129

TO-204 AA



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	—	39.37	—	.155
B	—	19.71	—	.776
C	6.35	8.89	.250	.350
D	.097	1.09	.038	.043
E	—	3.43	—	.135
F	30.15	BSC	1.187	BSC
G	10.67	11.18	.420	.440
H	5.33	6.10	.210	.240
J	16.68	17.12	.657	.674
K	11.20	11.98	.441	.472
Q	3.86	4.11	.152	.162
R	24.84	25.47	.978	1.00

PART NUMBER DESCRIPTION



NOTE: Valid combinations are only those referenced in the IXYS price book or product selector guide. Consult your local IXYS sales office to confirm availability of specific combinations or new types.