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

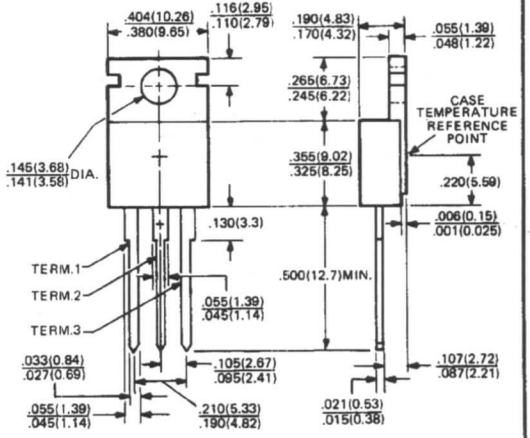
IRF630,631
D84DN2,M2

9.0 AMPERES
200, 150 VOLTS
$R_{DS(ON)}$ = 0.4 Ω

POWER·MOS FET
FIELD EFFECT POWER TRANSISTOR

N-CHANNEL

CASE STYLE TO-220AB
DIMENSIONS ARE IN INCHES AND (MILLIMETERS)



UNIT	TYPE	TERM.1	TERM.2	TERM.3	TAB
POWER MOS FET	TO-220-AB	GATE	DRAIN	SOURCE	DRAIN

Features

- Polysilicon gate — Improved stability and reliability
- No secondary breakdown — Excellent ruggedness
- Ultra-fast switching — Independent of temperature
- Voltage controlled — High transconductance
- Low input capacitance — Reduced drive requirement
- Excellent thermal stability — Ease of paralleling

maximum ratings (T_C = 25°C) (unless otherwise specified)

RATING	SYMBOL	IRF630/D84DN2	IRF631/D84DM2	UNITS
Drain-Source Voltage	V_{DSS}	200	150	Volts
Drain-Gate Voltage, R_{GS} = 1MΩ	V_{DGR}	200	150	Volts
Continuous Drain Current @ T_C = 25°C @ T_C = 100°C	I_D	9.0 6.0	9.0 6.0	A A
Pulsed Drain Current(1)	I_{DM}	36	36	A
Gate-Source Voltage	V_{GS}	±20	±20	Volts
Total Power Dissipation @ T_C = 25°C Derate Above 25°C	P_D	75 0.6	75 0.6	Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to 150	-55 to 150	°C

thermal characteristics

Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.67	1.67	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	80	80	°C/W
Maximum Lead Temperature for Soldering Purposes: ⅛" from Case for 5 Seconds	T_L	260	260	°C

(1) Repetitive Rating: Pulse width limited by max. junction temperature.

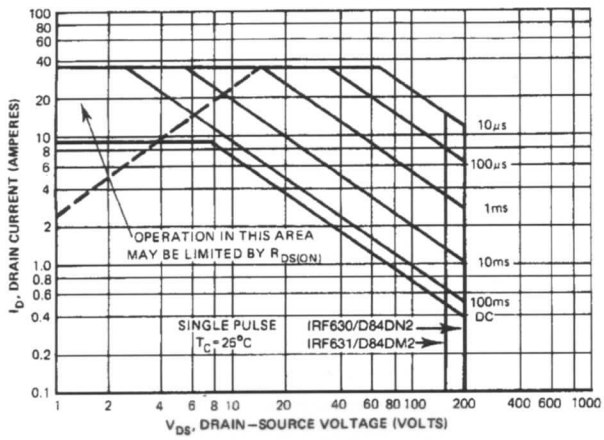
NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any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

Quality Semi-Conductors

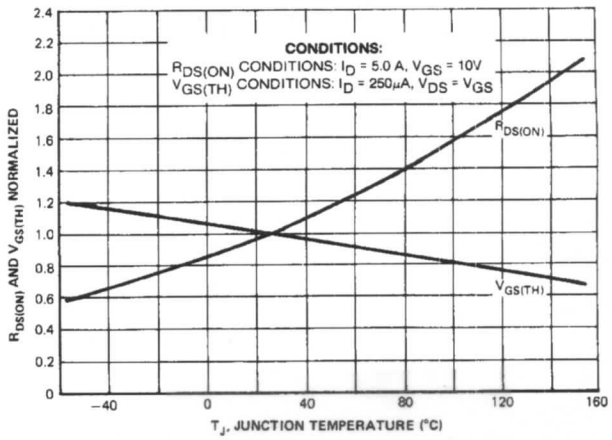
electrical characteristics (T_C = 25° C) (unless otherwise specified)

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
off characteristics						
Drain-Source Breakdown Voltage (V_{GS} = 0V, I_D = 250 μA)	IRF630/D84DN2 IRF631/D84DM2	BV_{DSS}	200 150	— —	— —	Volts
Zero Gate Voltage Drain Current (V_{DS} = Max Rating, V_{GS} = 0V, T_C = 25°C) (V_{DS} = Max Rating, × 0.8, V_{GS} = 0V, T_C = 125°C)		I_{DSS}	— —	— —	250 1000	μA
Gate-Source Leakage Current (V_{GS} = ±20V)		I_{GSS}	—	—	±500	nA
on characteristics*						
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 250 μA)	T_C = 25°C	$V_{GS(TH)}$	2.0	—	4.0	Volts
On-State Drain Current (V_{GS} = 10V, V_{DS} = 10V)		$I_{D(ON)}$	9.0	—	—	A
Static Drain-Source On-State Resistance (V_{GS} = 10V, I_D = 5.0A)		$R_{DS(ON)}$	—	0.34	0.4	Ohms
Forward Transconductance (V_{DS} = 10V, I_D = 5.0A)		g_{fs}	2.4	3.0	—	mhos
dynamic characteristics						
Input Capacitance	V_{GS} = 0V	C_{iss}	—	650	800	pF
Output Capacitance	V_{DS} = 25V	C_{oss}	—	150	450	pF
Reverse Transfer Capacitance	f = 1 MHz	C_{rss}	—	30	150	pF
switching characteristics*						
Turn-on Delay Time	V_{DS} = 90V	$t_{d(on)}$	—	15	—	ns
Rise Time	I_D = 5.0A, V_{GS} = 15V	t_r	—	25	—	ns
Turn-off Delay Time	R_{GEN} = 50Ω, R_{GS} = 12.5Ω	$t_{d(off)}$	—	30	—	ns
Fall Time	($R_{GS\ (EQUIV.)}$ = 10Ω)	t_f	—	20	—	ns
source-drain diode ratings and characteristics*						
Continuous Source Current		I_S	—	—	9.0	A
Pulsed Source Current		I_{SM}	—	—	36.0	A
Diode Forward Voltage (T_C = 25°C, V_{GS} = 0V, I_S = 9.0A)		V_{SD}	—	1.0	2.0	Volts
Reverse Recovery Time (I_S = 9.0A, dI_S/dt = 100A/μsec, T_C = 125°C)		t_{rr} Q_{RR}	— —	300 2.5	— —	ns μC

*Pulse Test: Pulse width ≤ 300 μs, duty cycle ≤ 2%



MAXIMUM SAFE OPERATING AREA



TYPICAL NORMALIZED $R_{DS(ON)}$ AND $V_{GS(TH)}$ VS. TEMP.