POWER-MOS FET
FIELD EFFECT POWER TRANSISTOR

IRF740,741
D84EQ2,Q1

10.0 AMPERES
400, 350 VOLTS
$R_{DS(ON)}$ = 0.55 Ω

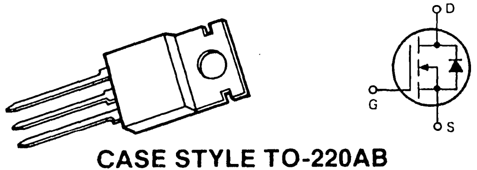
This series of N-Channel Enhancement-mode Power MOSFETs utilizes GE's advanced Power DMOS technology to achieve low on-resistance with excellent device ruggedness and reliability.

This design has been optimized to give superior performance in most switching applications including: switching power supplies, inverters, converters and solenoid/relay drivers. Also, the extended safe operating area with good linear transfer characteristics makes it well suited for many linear applications such as audio amplifiers and servo motors.

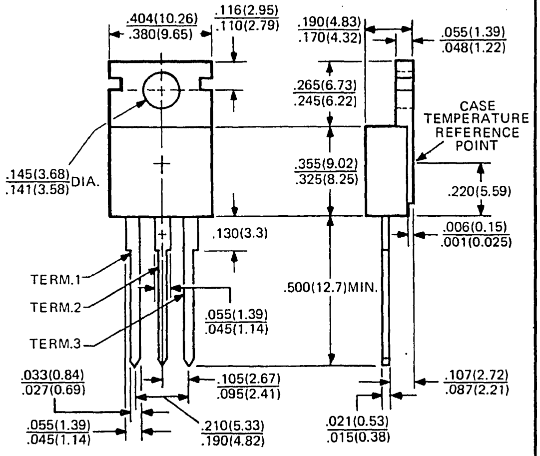
Features

- 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

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

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

RATING	SYMBOL	IRF740/D84EQ2	IRF741/D84EQ1	UNITS
Drain-Source Voltage	V_{DSS}	400	350	Volts
Drain-Gate Voltage, R_{GS} = 1MΩ	V_{DGR}	400	350	Volts
Continuous Drain Current @ T_C = 25°C @ T_C = 100°C	I_D	10 6	10 6	A A
Pulsed Drain Current(1)	I_{DM}	40	40	A
Gate-Source Voltage	V_{GS}	±20	±20	Volts
Total Power Dissipation @ T_C = 25°C Derate Above 25°C	P_D	125 1.0	125 1.0	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	$R_{\theta JC}$	1.00	1.00	°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.

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

off characteristics

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage (V_{GS} = 0V, I_D = 250 μA)	IRF740/D84EQ2 IRF741/D84EQ1	BV_{DSS}	400 350	— —	— —	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*

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
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)		$I_{D(ON)}$	10	—	—	A
Static Drain-Source On-State Resistance (V_{GS} = 10V, I_D = 5A)		$R_{DS(ON)}$	—	0.48	0.55	Ohms
Forward Transconductance (V_{DS} = 10V, I_D = 5A)		g_{fs}	3.2	4.5	—	mhos

dynamic characteristics

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
Input Capacitance	V_{GS} = 0V	C_{iss}	—	1400	1600	pF
Output Capacitance	V_{DS} = 25V	C_{oss}	—	210	450	pF
Reverse Transfer Capacitance	f = 1 MHz	C_{rss}	—	37	150	pF

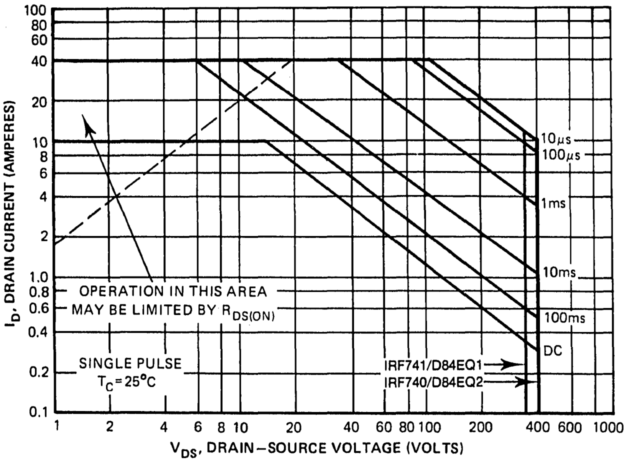
switching characteristics*

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
Turn-on Delay Time	V_{DS} = 175V	$t_{d(on)}$	—	20	—	ns
Rise Time	I_D = 5A, V_{GS} = 15V	t_r	—	20	—	ns
Turn-off Delay Time	R_{GEN} = 50Ω, R_{GS} = 12.5Ω	$t_{d(off)}$	—	70	—	ns
Fall Time	($R_{GS\ (EQUIV.)}$ = 10Ω)	t_f	—	30	—	ns

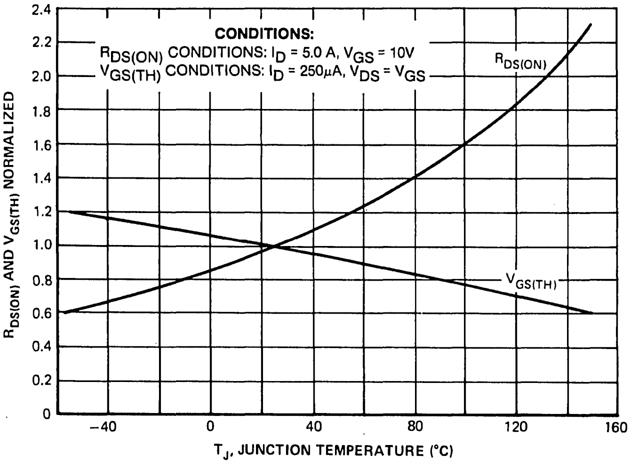
source-drain diode ratings and characteristics*

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNIT
Continuous Source Current	I_S	—	—	10	A
Pulsed Source Current	I_{SM}	—	—	40	A
Diode Forward Voltage (T_C = 25° C, V_{GS} = 0V, I_S = 10A)	V_{SD}	—	0.9	2.0	Volts
Reverse Recovery Time (I_S = 10A, dI_S/dt = 100A/μsec, T_C = 125° C)	t_{rr} Q_{RR}	— —	420 5.5	— —	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.