POWER·MOS FET
FIELD EFFECT POWER TRANSISTOR

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.

Applications

- Switching power supplies
- DC to DC inverters
- CMOS and TTL to high current interface
- Line drivers
- Logic buffers
- Pulse amplifiers

Features

- High speed, high current switching
- Current sharing capability when paralleled
- Directly interface to CMOS, DTL, TTL logic
- Simple DC biasing
- Extended safe operating area
- Inherently temperature stable

N-CHANNEL

CASE STYLE TO-202
DIMENSIONS ARE IN INCHES AND (MILLIMETERS)

TYPE	TERM. 1	TERM. 2	TERM. 3	TAB
TO-202	SOURCE	GATE	DRAIN	DRAIN
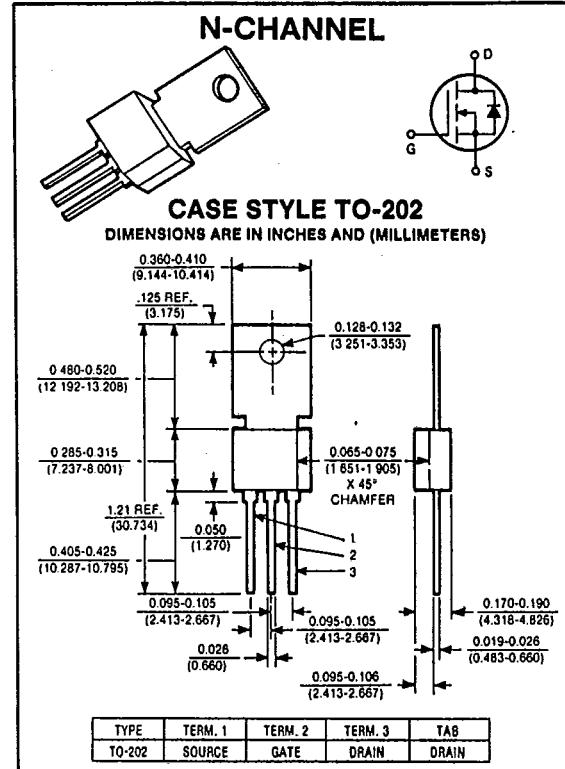
maximum ratings ($T_A = 25°C$) (unless otherwise specified)

RATING	SYMBOL	VN40AFA	VN67AFA	VN89AFA	UNITS
Drain-Source Voltage	V_{DSS}	40	60	80	Volts
Drain-Gate Voltage, $R_{GS} = 1M\Omega$	V_{DGR}	40	60	80	Volts
Continuous Drain Current @ $T_A = 25°C$	I_D	1.2	1.2	1.2	A
Peak Drain Current[1]	I_{DM}	3.0	3.0	3.0	A
Gate-Source Voltage	V_{GS}	±30	±30	±30	Volts
Total Power Dissipation @ $T_A = 25°C$ Derate Above 25°C	P_D	12 96	12 96	12 96	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	−40 to 150	−40 to 150	−40 to 150	°C

thermal characteristics

	SYMBOL				
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	10.4	10.4	10.4	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/16" from Case for 10 Seconds	T_L	300	300	300	°C

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

off characteristics

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage ($V_{GS} = 0V$, $I_D = 10\,\mu A$)	VN40AFA VN67AFA VN89AFA	BV_{DSS}	40 60 80	— — —	— — —	Volts
Zero Gate Voltage Drain Current (V_{DS} = Max Rating, $V_{GS} = 0V$) (V_{DS} = Max Rating, × 0.8, $V_{GS} = 0V$, $T_A = 125°C$)		I_{DSS}	— —	— —	10 100	μA
Gate-Source Leakage Current ($V_{GS} = 15V$, $V_{DS} = 0V$) ($V_{GS} = 15V$, $V_{DS} = 0V$ - $T_A = 125°C$)		I_{GSS}	— —	— —	100 500	nA nA

on characteristics*

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 1\,mA$)	VN40AFA VN67AFA VN89AFA	$V_{GS(TH)}$	0.6 0.8 0.8	1.2 1.2 1.2	— — —	Volts
Drain-Source Saturation Voltage ($V_{GS} = 5V$, $I_D = 0.3A$)	VN40AFA VN67AFA VN89AFA	$V_{DS(ON)}$	— — —	— — —	2.0 1.7 1.9	V
Drain-Source Saturation Voltage ($V_{GS} = 10V$, $I_D = 1.0A$)	VN40AFA VN67AFA VN89AFA	$V_{DS(ON)}$	— — —	— — —	5.0 3.5 4.5	V
On-State Drain Current ($V_{DS} = 25V$, $V_{GS} = 10V$)		$I_{D(ON)}$	1	—	—	A
Forward Transconductance ($V_{DS} = 24V$, $I_D = 0.5A$, $f = 1\,KHz$)		g_{fs}	—	.25	—	mhos

dynamic characteristics

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
Input Capacitance	$V_{GS} = 0V$	C_{iss}	—	—	50	pF
Output Capacitance	$V_{DS} = 25V$	C_{oss}	—	—	50	pF
Reverse Transfer Capacitance	$f = 1\,MHz$	C_{rss}	—	—	10	pF

switching characteristics*

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
Turn-on Delay Time	See switching times waveform below	$t_{d(on)}$	—	2	5	ns
Rise Time		T_r	—	2	5	ns
Turn-off Delay Time		$t_{d(off)}$	—	2	5	ns
Fall Time		t_f	—	2	5	ns

*Pulse Test: Pulse width $\leq 300\,\mu s$, duty cycle $\leq 2\%$
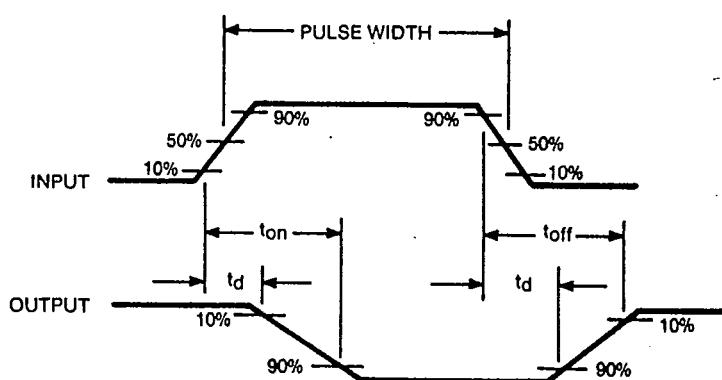
SWITCHING TIME TEST WAVEFORMS