POWER-MOS FET
FIELD EFFECT POWER TRANSISTOR

VN40AFA Series

1.2 AMPERES
40-80 VOLTS
$R_{DS(ON)}$ = 3.5-5.0 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.

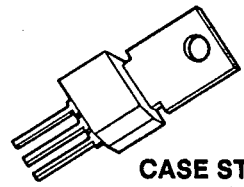
Applications

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

Features

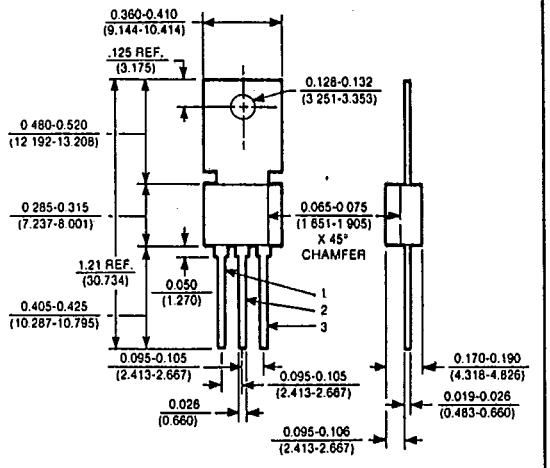
- High speed, high current switching
- Current sharing capability when paralleled
- Directly interface to CMOS, DTL, TTL logic
- Simple DC biasing
- Extended safe operating area
- Inherently temperature stable

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} = 1MΩ	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

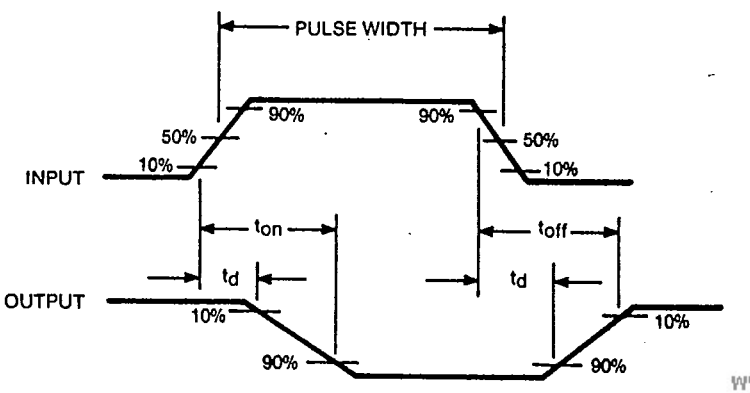
thermal characteristics

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.

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
off characteristics						
Drain-Source Breakdown Voltage (V_{GS} = 0V, I_D = 10 μA)	VN40AFA	BV_{DSS}	40	—	—	Volts
	VN67AFA		60	—	—	
	VN89AFA		80	—	—	
Zero Gate Voltage Drain Current (V_{DS} = Max Rating, V_{GS} = 0V)		I_{DSS}	—	—	10	μA
(V_{DS} = Max Rating, × 0.8, V_{GS} = 0V, T_A = 125°C)			—	—	100	
Gate-Source Leakage Current (V_{GS} = 15V, V_{DS} = 0V)		I_{GSS}	—	—	100	nA
(V_{GS} = 15V, V_{DS} = 0V - T_A = 125 °C)			—	—	500	nA
on characteristics*						
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 1 mA)	VN40AFA	$V_{GS(TH)}$	0.6	1.2	—	Volts
	VN67AFA		0.8	1.2	—	
	VN89AFA		0.8	1.2	—	
Drain-Source Saturation Voltage (V_{GS} = 5V, I_D = 0.3A)	VN40AFA	$V_{DS(ON)}$	—	—	2.0	V
	VN67AFA		—	—	1.7	
	VN89AFA		—	—	1.9	
Drain-Source Saturation Voltage (V_{GS} = 10V, I_D = 1.0A)	VN40AFA	$V_{DS(ON)}$	—	—	5.0	V
	VN67AFA		—	—	3.5	
	VN89AFA		—	—	4.5	
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						
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*						
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 ≤ 300 μs, duty cycle ≤ 2%



SWITCHING TIME TEST WAVEFORMS