



# POWER-MOS FET

## FIELD EFFECT POWER TRANSISTOR

### VN40AFA Series

1.2 AMPERES  
40-80 VOLTS  
RDS(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.

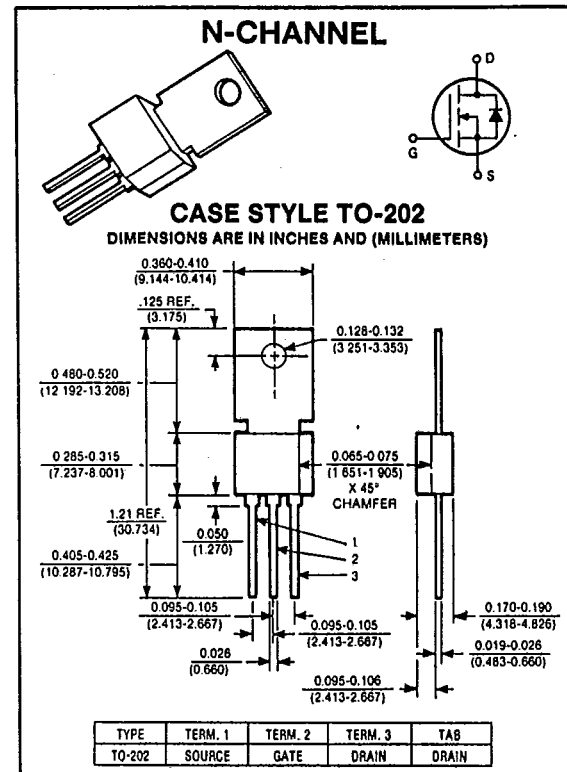
This design has been optimized to give superior performance in most switching applications including: switching power supplies, inverters, converters and solenoid/relay drivers. Also, the extended safe operating area with good linear transfer characteristics makes it well suited for many linear applications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



maximum ratings ( $T_A = 25^\circ\text{C}$ ) (unless otherwise specified)

RATING	SYMBOL	VN40AFA	VN67AFA	VN89AFA	UNITS
Drain-Source Voltage	$V_{DSS}$	40	60	80	Volts
Drain-Gate Voltage, $R_{GS} = 1\text{M}\Omega$	$V_{DGR}$	40	60	80	Volts
Continuous Drain Current @ $T_A = 25^\circ\text{C}$	$I_D$	1.2	1.2	1.2	A
Peak Drain Current <sup>(1)</sup>	$I_{DM}$	3.0	3.0	3.0	A
Gate-Source Voltage	$V_{GS}$	$\pm 30$	$\pm 30$	$\pm 30$	Volts
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$	$P_D$	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.

## off characteristics

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 ( $V_{DS} = \text{Max Rating}, V_{GS} = 0V$ ) ( $V_{DS} = \text{Max Rating}, \times 0.8, V_{GS} = 0V, T_A = 125^\circ C$ )		$I_{DSS}$	— —	— —	10 100	$\mu A$
Gate-Source Leakage Current ( $V_{GS} = 15V, V_{DS} = 0V$ ) ( $V_{GS} = 15V, V_{DS} = 0V - T_A = 125^\circ C$ )		$I_{GSS}$	— —	— —	100 500	nA nA

## on characteristics\*

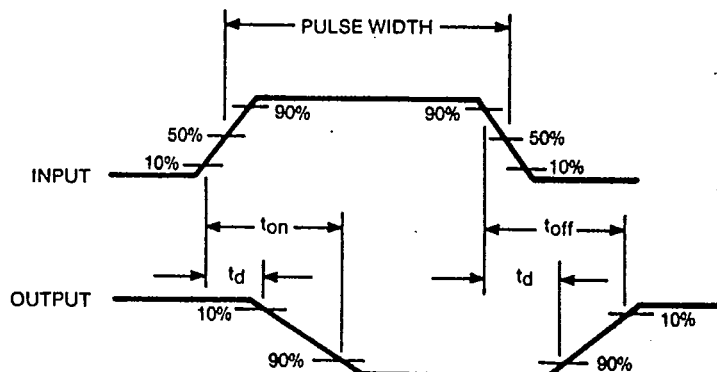
Gate Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 1 \text{ mA}$ )	VN40AFA VN67AFA VN89AFA	$V_{GS(TH)}$	0.6 0.8 0.8	1.2 1.2 1.2	— — —	Volts
Drain-Source Saturation Voltage ( $V_{GS} = 5V, I_D = 0.3A$ )	VN40AFA VN67AFA VN89AFA	$V_{DS(ON)}$	— — —	— — —	2.0 1.7 1.9	V
Drain-Source Saturation Voltage ( $V_{GS} = 10V, I_D = 1.0A$ )	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 ( $V_{DS} = 24V, I_D = 0.5A, f = 1 \text{ KHz}$ )		$g_{fs}$	—	.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	$f = 1 \text{ MHz}$	$C_{rss}$	—	—	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  $\leq 300 \mu s$ , duty cycle  $\leq 2\%$ 

SWITCHING TIME TEST WAVEFORMS