




MOSPOWER Selector Guide (Continued)

N-Channel MOSPOWER (Continued)

Device	Breakdown Voltage (Volts)	r _{DS(on)} (Ohms)	I _D Continuous (Amps)	Power Dissipation (Watts)	Part Number	
 <p>TO-220AB</p>	200	0.18	18.0	125	IRF640	
	200	0.22	16.0	125	IRF642	
	200	0.4	9.0	75	IRF630	
	200	0.6	8.0	75	IRF632	
	200	0.8	5.0	40	IRF620	
	200	1.2	4.0	40	IRF622	
	170	6.0	1.4	20	VN1706D	
	150	0.18	18.0	125	IRF641	
	150	0.22	16.0	125	IRF643	
	150	0.4	9.0	75	IRF631	
	150	0.6	8.0	75	IRF633	
	150	0.8	5.0	40	IRF621	
	150	1.2	4.0	40	IRF623	
	120	0.18	14.0	75	VN1200D	
	120	0.25	12.0	75	VN1201D	
	120	6.0	1.4	20	VN1206D	
	100	0.085	27.0	125	IRF540	
	100	0.11	24.0	125	IRF542	
	100	0.18	14.0	75	VN1000D	
	100	0.18	14.0	75	IRF530	
	100	0.25	12.0	75	VN1001D	
	100	0.25	12.0	75	IRF532	
	100	0.30	8.0	40	IRF520	
	100	0.40	7.0	40	IRF522	
	80	0.18	14.0	75	VN0800D	
	80	0.25	12.0	75	VN0801D	
	80	4.0	1.7	20	VN88AD	
	80	4.5	1.6	20	VN89AD	
	60	0.085	27.0	125	IRF541	
	60	0.11	24.0	125	IRF543	
	60	0.12	18.0	75	VN0600D	
	60	0.15	16.0	75	VN0601D	
	60	0.18	14.0	75	IRF531	
	60	0.25	12.0	75	IRF533	
	60	0.30	8.0	40	IRF521	
	60	0.40	7.0	40	IRF523	
	60	3.0	1.9	20	VN66AD	
	60	3.5	1.8	20	VN67AD	
	40	0.12	18.0	75	VN0400D	
	40	0.15	16.0	75	VN0401D	
	40	3.0	1.9	20	VN46AD	
	40	5.0	1.5	20	VN40AD	
	30	1.2	2.5	20	VN0300D	
	 <p>TO-202AA</p>	80	4.0	1.5	15	VN88AF
		80	4.5	1.4	15	VN89AF
80		5.0	1.3	15	VN80AF	
60		3.0	1.7	15	VN66AF	
60		3.5	1.6	15	VN67AF	
40		3.0	1.6	15	VN46AF	
40		5.0	1.3	15	VN40AF	
240		6.0	0.8	6.25	VN2406B	
 <p>TO-39</p>	170	6.0	0.8	6.25	VN1706B	
	120	6.0	0.8	6.25	VN1206B	
	100	0.3	6.0	20	IRFF120	
	100	0.4	5.0	20	IRFF122	
	90	4.0	0.9	6.25	2N6661	
	90	4.5	0.9	6.25	VN99AB	
	90	5.0	0.8	6.25	VN90AB	
	60	0.3	6.0	20	IRFF121	
	60	0.4	5.0	20	IRFF123	
	60	3.0	1.1	6.25	2N6660	
	60	3.5	1.0	6.25	VN67AB	
	35	1.8	1.4	6.25	2N6659	
	35	2.5	1.2	6.25	VN35AB	

VN40AF ■ VN46AF



40V N-Channel Enhancement Mode MOSPOWER

These power FETs are designed especially for low power high frequency inverters, interface to CMOS and TTL logic, and line drivers.

FEATURES

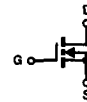
- High Input Impedance
- Extremely Fast Switching
- Rugged — Dissipation Limited SOA
- Internal Drain-Source Diode

BENEFITS

- Reduced Component Count
- Simpler Designs
 - Directly Interfaces CMOS & TTL
- Improved Circuit Performance
- Increased Reliability

Product Summary

Part Number	V_{DSS} (Volts)	$R_{DS(ON)}$ (Ohms)	Package
VN40AF	40	5	TO-202
VN46AF	40	3	TO-202



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

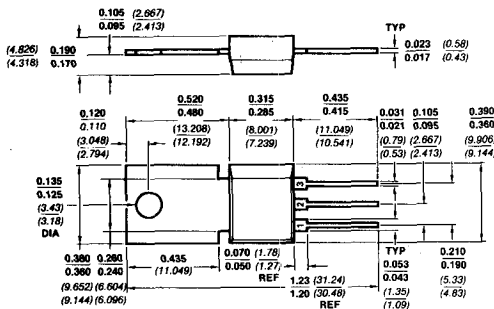
Drain-Source Voltage	40V
Drain-Gate Voltage	40V
Gate Current (Peak)	$\pm 1\text{A}$
Gate-Source Voltage	$\pm 40\text{V}$
Drain Current	
Continuous ¹	
VN40AF	$\pm 1.3\text{A}$
VN46AF	$\pm 1.6\text{A}$
Pulsed ²	$\pm 3\text{A}$

Maximum Dissipation	
at 25°C Case	15W
Linear Derating Factor	120 mW/ $^\circ\text{C}$
Operating and Storage	
Temperature	-55°C to $+150^\circ\text{C}$
Lead Temperature	
($1/16''$ from Case for 10 secs)	$+300^\circ\text{C}$

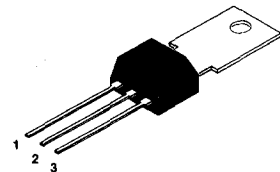
Notes:

1. Limited by package dissipation.
2. Pulse test — $80\mu\text{s}$ to $300\mu\text{s}$, 1% duty cycle.

PACKAGE DIMENSIONS



PIN 1 — Source
PIN 2 — Gate
PIN 3 & TAB — Drain



ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Parameter	Part Number	Min	Max	Unit	Test Conditions
Static					
BV _{DSS}	Drain-Source Breakdown Voltage	All	40	V	I _D = 10 μA, V _{GS} = 0
V _{GS(th)}	Gate Threshold Voltage	All	0.8	V	I _D = 1 mA, V _{DS} = V _{GS}
I _{GSS}	Gate-Body Leakage Current	All	100	nA	V _{GS} = 15V, V _{DS} = 0
I _{DSS}	Zero Gate Voltage Drain Current	All	10	μA	V _{DS} = 0.8 Max Rating, V _{GS} = 0
		All	500		V _{DS} = Max Rating, V _{GS} = 0, T _A = 125°C
I _{D(on)}	ON-State Drain Current ¹	All	1.0	A	V _{DS} = 25V, V _{GS} = 10V
V _{DS(on)}	Drain-Source ON-State Voltage	All	1.5	V	V _{GS} = 5V, I _D = 0.3A
		VN40AF	5.0		V _{GS} = 10V, I _D = 1A
		VN46AF	3.0		
r _{DS(on)}	Drain-Source, ON-State Resistance ¹	All	5.0	Ω	V _{GS} = 5V, I _D = 0.3A
		VN40AF	5.0		V _{GS} = 10V, I _D = 1A
		VN46AF	3.0		
Dynamic					
g _{fs}	Forward Transconductance ¹	All	170	mS	V _{DS} = 25V, I _D = 0.5A
C _{iss}	Input Capacitance	All	50	pF	V _{DS} = 25V, V _{GS} = 0, f = 1 MHz
C _{rss}	Reverse Transfer Capacitance	All	10		
C _{oss}	Common Source Output Capacitance	All	65		
t _{ON}	Turn-ON Time	All	10	ns	V _{DD} = 25V, I _D = 1A, R _L = 23Ω, R _θ = 25Ω
t _{OFF}	Turn-OFF Time	All	10		
Drain-Source Diode Characteristics					
		Typ			
V _{SD}	Forward ON Voltage ¹	All	-0.9	V	I _S = -1A, V _{GS} = 0
t _{rr}	Reverse Recovery Time	All	35	ns	V _{GS} = 0, I _F = I _R = 1A

Note:

1. Pulse test: 80-300 μs, 1% duty cycle.

Refer to VNMA Design Curves (See Section 4)

TEST CIRCUITS

FIGURE 1. Switching Test Circuit

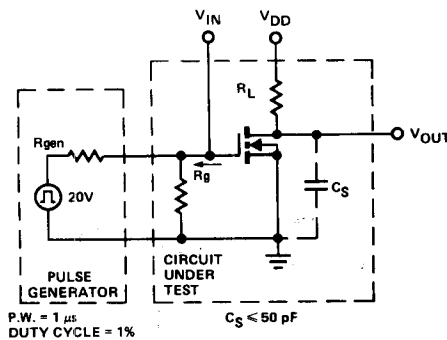
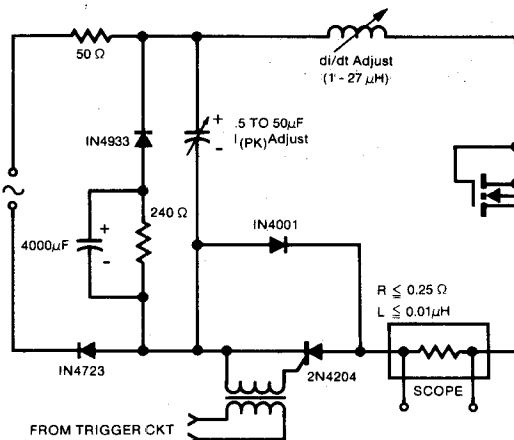


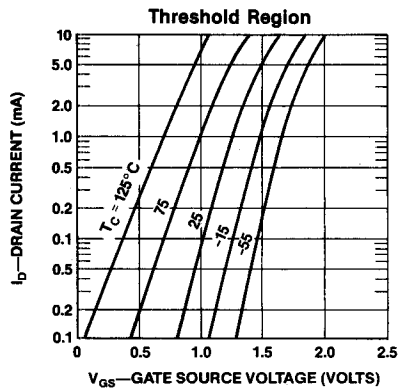
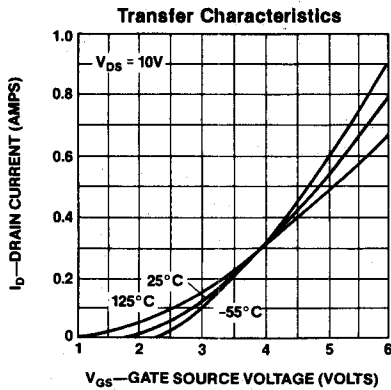
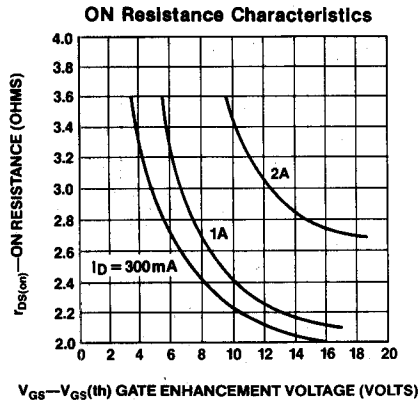
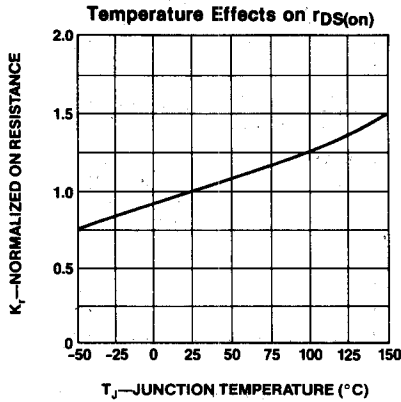
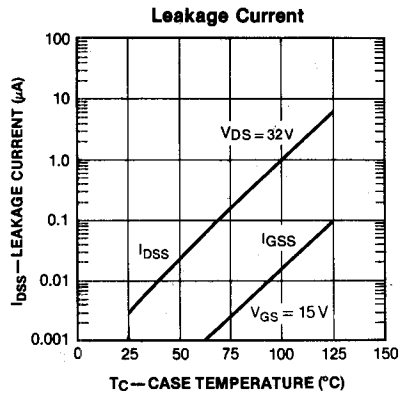
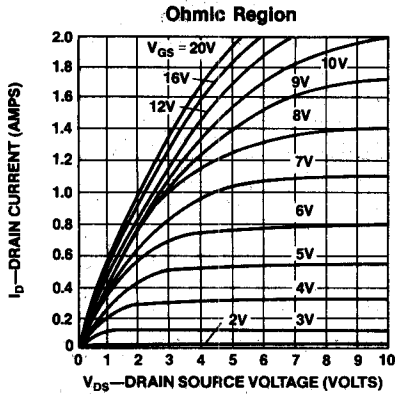
FIGURE 2. JEDEC Reverse Recovery Circuit



TYPICAL STATIC CHARACTERISTICS

(Pulse width 80μs—300μs, Duty cycle 1%, T_C=25°C)

Part Numbers: VN99AA, VN99AB, VN90AA, VN90AB, VN89AD, VN89AF, VN88AD, VN88AF, VN80AF, VN0808M, VN67AA, VN67AD, VN67AB, VN67AF, VN66AD, VN66AF, VN0606M, VN46AD, VN46AF, VN40AD, VN40AF, VN35AA, VN35AB, 2N6656, 2N6657, 2N6658, 2N6659, 2N6660, 2N6661

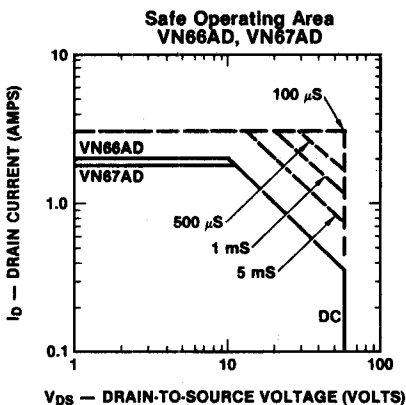
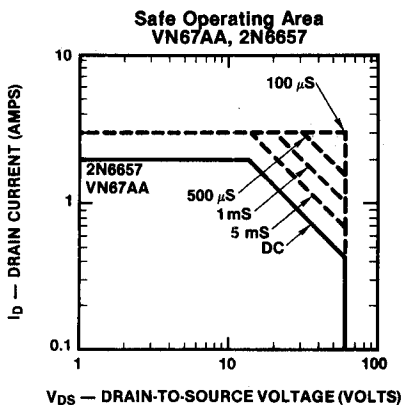
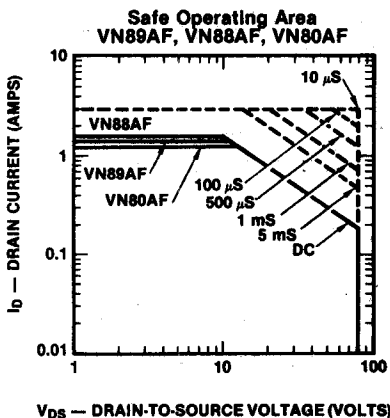
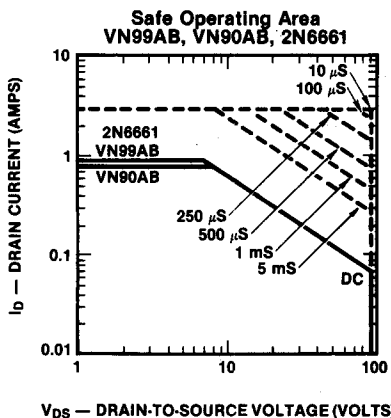
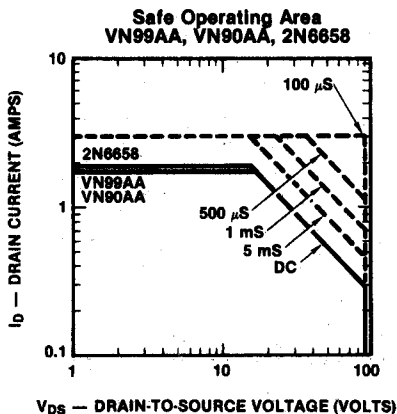
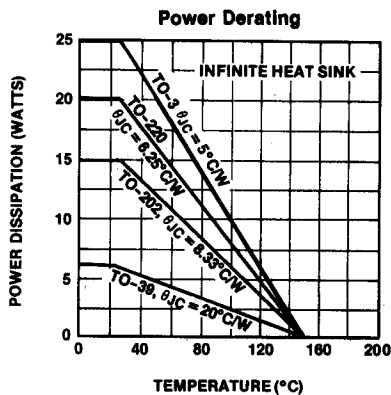


TYPICAL CHARACTERISTICS (Cont'd)

VNMA

VNMA

Part Numbers: VN99AA, VN99AB, VN90AA, VN90AB, VN89AD, VN89AF, VN88AD, VN88AF, VN80AF, VN0808M, VN67AA, VN67AD, VN67AB, VN67AF, VN66AD, VN66AF, VN0606M, VN46AD, VN46AF, VN40AD, VN40AF, VN35AA, VN35AB, 2N6656, 2N6657, 2N6658, 2N6659, 2N6660, 2N6661



TYPICAL CHARACTERISTICS (Cont'd)

Part Numbers: VN99AA, VN99AB, VN90AA, VN90AB, VN89AD, VN89AF, VN88AD, VN88AF, VN80AF, VN0808M, VN67AA, VN67AD, VN67AB, VN67AF, VN86AD, VN86AF, VN0606M, VN46AD, VN46AF, VN40AD, VN40AF, VN35AA, VN35AB, 2N6656, 2N6657, 2N6658, 2N6659, 2N6660, 2N6661

