

VN30AB, VN35AB, VN67AB, VN89AB, VN90AB n-Channel Enhancement-mode Vertical Power MOSFET

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

APPLICATIONS

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

ABSOLUTE MAXIMUM RATINGS

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

Drain-source Voltage	
VN30AB, VN35AB	35V
VN67AB	60V
VN89AB	80V
VN90AB	90V
Drain-gate Voltage	
VN30AB, VN35AB	35V
VN67AB	60V
VN89AB	80V
VN90AB	90V
Continuous Drain Current (see note 1)	1.2A
Peak Drain Current (see note 2)	3.0A
Continuous Forward Gate Current	2.0mA
Peak-gate Forward Current	100mA
Peak-gate Reverse Current	100mA
Gate-source Forward (Zener) Voltage	+15V
Gate-source Reverse (Zener) Voltage	-0.3V
Thermal Resistance, Junction to Case	20°C/W
Continuous Device Dissipation at (or below)	
25°C Case Temperature	6.25W
Linear Derating Factor	50mW/°C
Operating Junction	
Temperature Range	-55 to +150°C
Storage Temperature Range	-55 to +150°C
Lead Temperature	
(1/16 in. from case for 10 sec)	+300°C

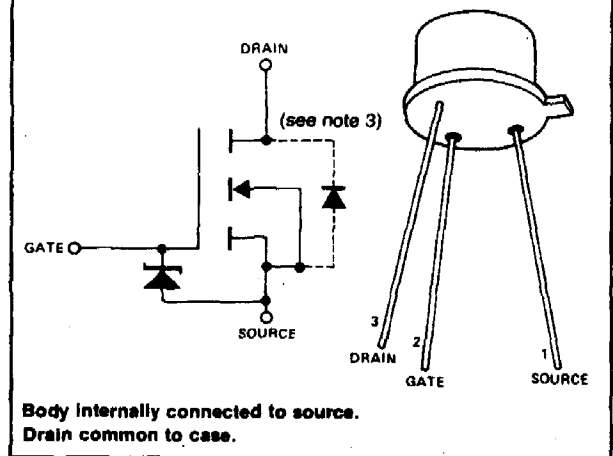
Note 1. $T_c = 25^\circ\text{C}$; controlled by typical $r_{DS(on)}$ and maximum power dissipation.

Note 2. Pulse width 80 μsec , duty cycle 1.0%.

Note 3. The Drain-source diode is an integral part of the MOSFET structure.

SCHEMATIC DIAGRAM

(OUTLINE DWG. TO-39)



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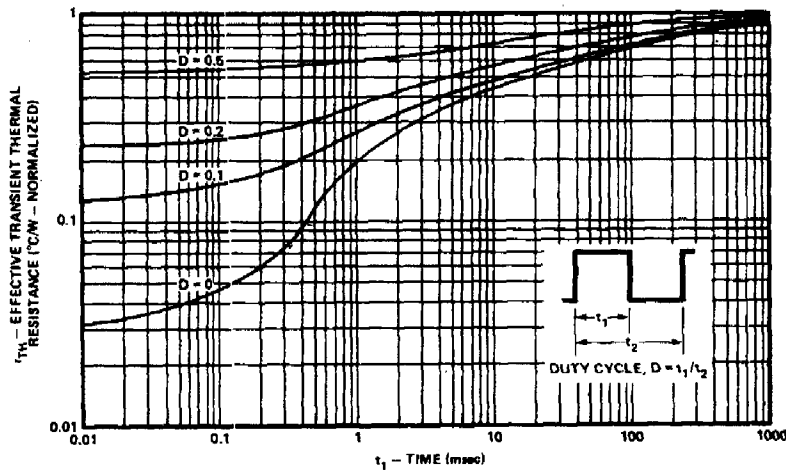
ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

CHARACTERISTIC	VN30AB			VN35AB			VN67AB			VN89AB			VN90AB			UNIT	TEST CONDITIONS
	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
1 BV _{DSS} Drain-Source Breakdown	35			35			60			80			90			V	I _D = 10 μA, V _{GS} = 0
2 V _{GS(th)} Gate Threshold Voltage	0.8	1.2		0.8	1.2		0.8	1.2		0.8	1.2		0.8	1.2			I _D = 1.0 mA, V _{DS} = V _{GS}
3 I _{GSS} Gate-Body Leakage		0.01	0.5		0.01	0.5		0.01	0.5		0.01	0.5		0.01	0.5	μA	V _{GS} = 10V, V _{DS} = 0
4 I _{SS} Zero Gate Voltage Drain Current			10			10			10			10			10		V _{GS} = 25V, V _{DS} = 0
5 R _{DS(on)} Drain-Source ON-State Resistance (Note 1)		2.2	5.0		2.2	2.5		2.2	3.5		2.2	4.5		2.2	5.0	Ω	V _{GS} = 5V, I _D = 300mA V _{GS} = 10V, I _D = 1.0A
6 I _{D(on)} ON-State Drain Current (Note 1)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	A	V _{GS} = 25V, V _{DS} = 10V	
7 g _{fs} Forward Transconductance		250			250			250			250			250	mΩ	V _{GS} = 25V, I _D = 0.5A	
8 C _{iss} Input Capacitance (Note 2)			50			50			50			50			50	pF	V _{GS} = 0, V _{DS} = 24V, f = 1.0MHz
9 C _{res} Reverse Transfer Capacitance (Note 2)			10			10			10			10			10		
10 C _{oss} Common Source Output Capacitance (Note 2)			40			40			40			40			40		
11 t _{on} Turn-ON Time (Note 2)		4	10		4	10		4	10		4	10		4	10	ns	
12 t _{off} Turn-OFF Time (Note 2)		4	10		4	10		4	10		4	10		4	10	ns	

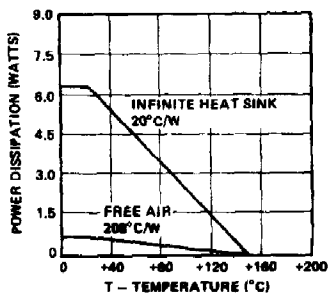
Note 1. Pulse Test — 80 μs, 1% duty cycle.

Note 2. Sample Test.

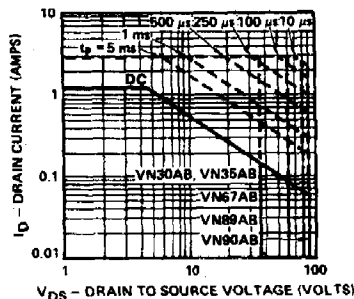
THERMAL RESPONSE



POWER DISSIPATION vs CASE OR AMBIENT TEMPERATURE



DC SAFE OPERATING REGION T_C = 25°C



BREAKDOWN VOLTAGE VARIATION WITH TEMPERATURE

