

VN35AK, VN66AK, VN67AK, VN98AK, VN99AK n-Channel Enhancement-mode Vertical Power MOSFET

FEATURES

- High speed, high current switching
- High gain-bandwidth product
- Inherently temperature stable
- Extended safe operating area
- Simple DC biasing
- Requires almost zero current drive

APPLICATIONS

- High current analog switches
- RF power amplifiers
- Laser diode pulsers
- Line drivers
- Logic buffers
- Pulse amplifiers

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ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Drain-source Voltage		
VN35AK	35V	
VN66AK, VN67AK	60V	
VN98AK, VN99AK	90V	
Drain-gate Voltage		
VN35AK	35V	
VN66AK, VN67AK	60V	
VN98AK, VN99AK	90V	
Continuous Drain Current (see note 1)		1.2A
Peak Drain Current (see note 2)		3.0A
Gate-source Forward Voltage		+30V
Gate-source Reverse Voltage		-30V
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	

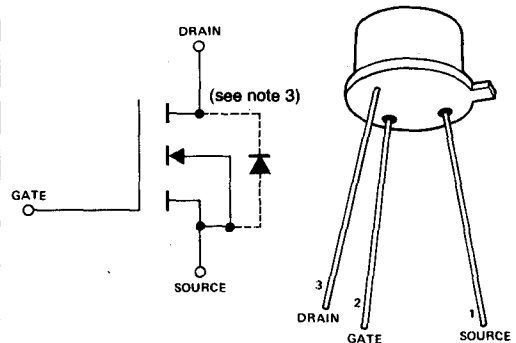
Note 1. T_C = 25°C; controlled by typical r_{DS(on)} and maximum power dissipation.

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

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

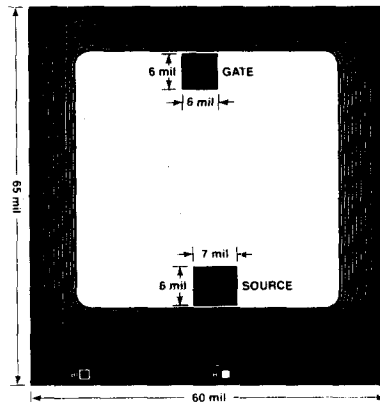
SCHEMATIC DIAGRAM

(OUTLINE DWG. TO-39)



Body internally connected to source.
Drain common to case.

CHIP TOPOGRAPHY



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INTERMIL

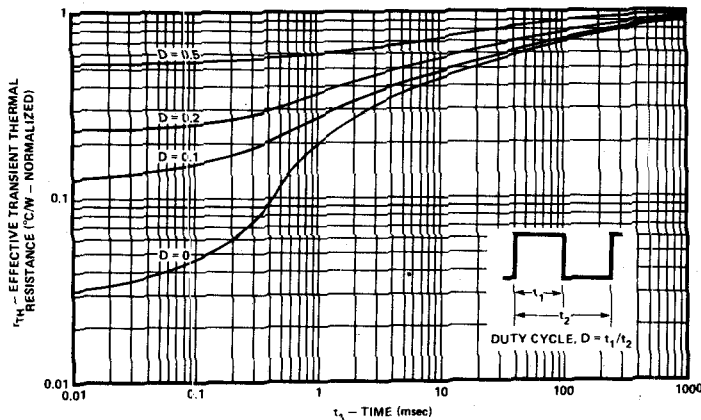
ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

CHARACTERISTIC	VN35AK			VN66AK VN67AK			VN98AK VN99AK			UNIT	TEST CONDITIONS	
	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX			
1 BV _{DSS} Drain-Source Breakdown	35			60			90			V	V _{GS} = 0, I _D = 10μA	
2 V _{GS(th)} Gate-Threshold Voltage	0.8		2.0	0.8		2.0	0.8		2.0	V	V _{DS} = V _{GS} , I _D = 1mA	
3 I _{GSS} Gate-Body Leakage		0.5	100		0.5	100		0.5	100	nA	V _{GS} = 15V, V _{DS} = 0	
4 I _{DSS} Zero Gate Voltage 5 Drain Current			500			500			500	μA	V _{GS} = 15V, V _{DS} = 0, T _A = 125°C (Note 2)	
			10			10			10	μA	V _{DS} = Max. Rating, V _{GS} = 0	
6 I _{DSS} Zero Gate Voltage 7 Drain Current			500			500			500	μA	V _{DS} = 0.8 Max. Rating, V _{GS} = 0, T _A = 125°C (Note 2)	
7 I _{DSS} Zero Gate Voltage 8 Drain Current		100			100			100		nA	V _{DS} = 25V, V _{GS} = 0	
8 I _{D(on)} ON-State Drain Current	1.0	2.0		1.0	2.0		1.0	2.0		A	V _{DS} = 25V, V _{GS} = 10V	
9 V _{D(sat)} Drain-Source 10 Saturation Voltage					1.0			1.1		V	V _{GS} = 5V, I _D = 0.3A	
					2.2		3.0		2.2	4.0	V	V _{GS} = 10V, I _D = 1.0A
		1.0			1.1				1.2		V	V _{GS} = 5V, I _D = 0.3A
		2.2	2.5		2.2	3.5		2.2	4.5		V	V _{GS} = 10V, I _D = 1.0A
11 g _{fs} Forward Transconductance	170	250		170	250		170	250		mΩ	V _{DS} = 24V, I _D = 0.5A, f = 1KHz	
12 C _{iss} Input Capacitance		40	50		40	50		40	50	pF	V _{GS} = 0, V _{DS} = 24V, f = 1MHz (Note 2)	
13 C _{oss} Common Source Output 14 Capacitance		38	45		35	40		32	40	pF		
15 C _{ras} Reverse Transfer Capacitance		7	10		6	10		5	10	pF		
16 t _{on} Turn ON Time		3	8		3	8		3	8	ns		
17 t _{off} Turn OFF Time		3	8		3	8		3	8	ns		

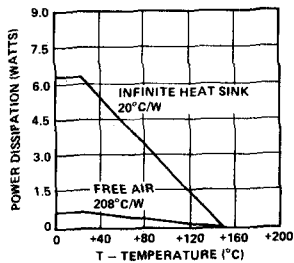
Note 1. Pulse test — 80μs pulse, 1% duty cycle.

Note 2. Sample test.

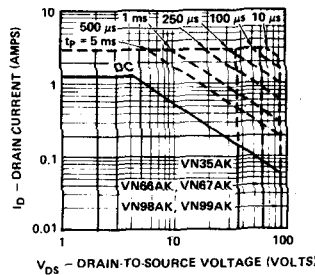
THERMAL RESPONSE



POWER DISSIPATION vs CASE OR AMBIENT TEMPERATURE



DC SAFE OPERATING REGION T_c = 25°C



BREAKDOWN VOLTAGE VARIATION WITH TEMPERATURE

