Siliconix incorporated

VN1706B, VN1706D

N-Channel Enhancement-Mode MOS Transistors

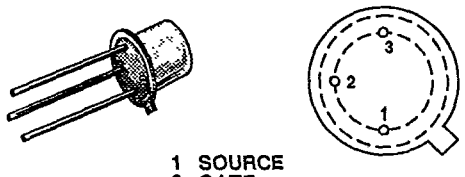
T-39-05

PRODUCT SUMMARY

PART NUMBER	$V_{(BR)DSS}$ (V)	$r_{DS(ON)}$ (Ω)	I_D (A)	PACKAGE
VN1706B	170	6	0.63	TO-205AD
VN1706D	170	6	1.12	TO-220

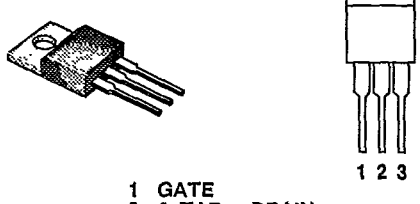
Performance Curves: VNDB24 (See Section 7)

TO-205AD (TO-39) BOTTOM VIEW



1 SOURCE
2 GATE
3 DRAIN & CASE

TO-220 TOP VIEW



1 GATE
2 & TAB – DRAIN
3 SOURCE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	VN1706B	VN1706D	UNITS
Drain-Source Voltage		V_{DS}	170	170	V
Gate-Source Voltage		V_{GS}	±20	±30	V
Continuous Drain Current	T_C = 25°C	I_D	0.63	1.12	A
	T_C = 100°C		0.4	0.7	A
Pulsed Drain Current[1]		I_{DM}	3	3	A
Power Dissipation	T_C = 25°C	P_D	6.25	20	W
	T_C = 100°C		2.5	8	W
Operating Junction and Storage Temperature		T_J, T_{stg}	−55 to 150		°C
Lead Temperature (1/16" from case for 10 seconds)		T_L	300		°C

THERMAL RESISTANCE

THERMAL RESISTANCE	SYMBOL	VN1706B	VN1706D	UNITS
Junction-to-Ambient	R_{thJA}	170	80	°C/W

[1]Pulse width limited by maximum junction temperature

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VN1706B, VN1706D

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ELECTRICAL CHARACTERISTICS[1]				LIMITS			
					VN1706		
PARAMETER	SYMBOL	TEST CONDITIONS		TYP[2]	MIN	MAX	UNIT
STATIC							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 100 µA		230	170		V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1 mA		1.4	0.8	2.0	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±15 V		±1		±100	nA
			T_C = 125°C	±5		±500	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 120 V, V_{GS} = 0 V		0.01		10	µA
			T_C = 125°C	1		500	
On-State Drain Current[3]	$I_{D(ON)}$	V_{DS} = 10 V, V_{GS} = 10 V		1.5	1		A
Drain-Source On-Resistance[3]	$r_{DS(ON)}$	V_{GS} = 2.5 V, I_D = 0.1 A		7.5		10	Ω
		V_{GS} = 10 V, I_D = 0.5 V		5		6	
			T_C = 125°C	10.8		14.8	
Forward Transconductance[3]	g_{FS}	V_{DS} = 10 V, I_D = 0.5 A		530	300		mS
Common Source Output Conductance[3]	g_{OS}	V_{DS} = 7.5 V, I_D = 0.5 A		475			µS
DYNAMIC							
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz		105		125	pF
Output Capacitance	C_{oss}			25		50	
Reverse Transfer Capacitance	C_{rss}			5		20	
SWITCHING							
Turn-On Time	$t_{d(ON)}$	V_{DD} = 60 V, R_L = 150 Ω, I_D = 0.4 A, V_{GEN} = 10 V, R_G = 25 Ω (Switching time is essentially independent of operating temperature)		3		8	ns
	t_r			2		8	
Turn-Off Time	$t_{d(OFF)}$			13		18	
	t_f			9		12	

NOTES: 1. T_C = 25°C unless otherwise noted.
2. For design aid only, not subject to production testing.
3. Pulse test: PW = 300 µs, duty cycle ≤ 2%.