Siliconix incorporated

VN46AFD

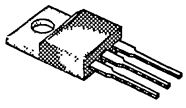
N-Channel Enhancement-Mode MOS Transistor

PRODUCT SUMMARY

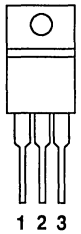
$V_{(BR)DSS}$ (V)	$r_{DS(ON)}$ (Ω)	I_D (A)	PACKAGE
40	3	1.46	TO-220SD

Performance Curves: **VNDQ06** (See Section 7)

TO-220SD



TOP VIEW



1 2 3

1 SOURCE
2 GATE
3 & TAB – DRAIN

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

PARAMETERS/TEST CONDITIONS		SYMBOL	VN46AFD	UNITS
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±30	
Continuous Drain Current	T_C = 25°C	I_D	1.46	A
	T_C = 100°C		0.92	
Pulsed Drain Current[1]		I_{DM}	3	
Power Dissipation	T_C = 25°C	P_D	15	W
	T_C = 100°C		6	
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	

THERMAL RESISTANCE

THERMAL RESISTANCE	SYMBOL	VN46AFD	UNITS
Junction-to-Case	R_{thJC}	8.3	°C/W

[1]Pulse width limited by maximum junction temperature

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ELECTRICAL CHARACTERISTICS[1]			LIMITS			
				VN46AFD		
PARAMETER	SYMBOL	TEST CONDITIONS	TYP[2]	MIN	MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 10 µA	70	40		V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1 mA	1.5	0.8	2.5	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±15 V	± 1		±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40 V, V_{GS} = 0 V	0.05		10	µA
		V_{DS} = 32 V, V_{GS} = 0 V, T_C = 125°C	0.3		500	µA
On-State Drain Current[3]	$I_{D(ON)}$	V_{DS} = 10 V, V_{GS} = 10 V	1.8	1		A
Drain-Source On-Resistance[3]	$r_{DS(ON)}$	V_{GS} = 5 V, I_D = 0.3 A	1.8		5	Ω
		V_{GS} = 10 V, I_D = 1 A	1.3		3	Ω
		V_{GS} = 10 V, I_D = 1 A, T_C = 125°C	2.6		6	Ω
Forward Transconductance[3]	g_{FS}	V_{DS} = 10 V, I_D = 0.5 A	350	170		mS
Common Source Output Conductance[3]	g_{OS}	V_{DS} = 10 V, I_D = 0.1 A	1100			µS
DYNAMIC						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz	35		50	pF
Output Capacitance	C_{oss}		25		65	pF
Reverse Transfer Capacitance	C_{rss}		5		10	pF
SWITCHING						
Turn-On Time	t_{ON}	V_{DD} = 25 V, R_L = 23 Ω, I_D = 1 A, V_{GEN} = 10 V, R_G = 25 Ω (Switching time is essentially independent of operating temperature)	8		15	ns
Turn-Off Time	t_{OFF}		9.5		15	ns

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%.