

N-Channel Enhancement-Mode MOS Transistors

Product Summary

V_{(BR)DSS} Min (V)	r_{DS(on)} Max (Ω)	V_{GS(th)} (V)	I_D (A)
90	4 @ V _{GS} = 10 V	0.8 to 2	0.86

Features

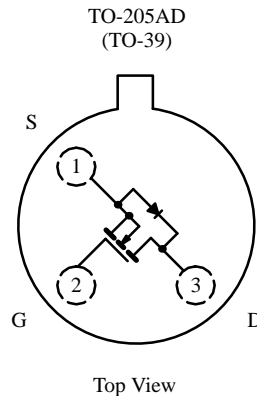
- Military Qualified
- Low On-Resistance: 3.6 Ω
- Low Threshold: 1.6 V
- Low Input Capacitance: 35 pF
- Fast Switching Speed: 6 ns
- Low Input and Output Leakage

Benefits

- Guaranteed Reliability
- Low Offset Voltage
- Low-Voltage Operation
- Easily Driven Without Buffer
- High-Speed Circuits
- Low Error Voltage

Applications

- Military Applications
- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays



Absolute Maximum Ratings (T_C = 25°C Unless Otherwise Noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	90	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 150°C)	I _D	T _C = 25°C	0.86
		T _C = 100°C	0.54
Pulsed Drain Current ^a	I _{DM}	3	A
Power Dissipation	P _D	T _C = 25°C	6.25
		T _A = 25°C	0.725
Maximum Junction-to-Ambient ^b	R _{thJA}	170	°C/W
Maximum Junction-to-Case	R _{thJC}	20	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150	°C

Notes

- a. Pulse width limited by maximum junction temperature.
- b. Not required by Military Spec.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70225.

Specifications^a

Parameter	Symbol	Test Conditions	Limits			Unit	
			Min	Typ ^b	Max		
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 10\ \mu\text{A}$	90	125		V	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1\ \text{mA}$		1.6	2		
			$T_C = -55^\circ\text{C}$		1.8		2.5
			$T_C = 125^\circ\text{C}$	0.3	1.3		
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 20\ \text{V}$			± 100	nA	
					± 500		
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 72\ \text{V}, V_{GS} = 0\ \text{V}$			1	μA	
					100		
On-State Drain Current ^c	$I_{D(on)}$	$V_{DS} = 10\ \text{V}, V_{GS} = 10\ \text{V}$		1.8		mA	
Drain-Source On-Resistance ^c	$r_{DS(on)}$	$V_{GS} = 5\ \text{V}, I_D = 0.3\ \text{A}$		3.8	5.3	Ω	
			$V_{GS} = 10\ \text{V}, I_D = 1\ \text{A}$		3.6		4
				$T_C = 125^\circ\text{C}$			6.7
Forward Transconductance ^c	g_{fs}	$V_{DS} = 7.5\ \text{V}, I_D = 0.475\ \text{A}$	170	340		mS	
Diode Forward Voltage	V_{SD}	$I_S = 0.86\ \text{A}, V_{GS} = 0\ \text{V}$	0.7	0.9	1.4	V	
Dynamic							
Input Capacitance	C_{iss}	$V_{DS} = 25\ \text{V}, V_{GS} = 0\ \text{V}$ $f = 1\ \text{MHz}$		35	50	pF	
Output Capacitance	C_{oss}			15	40		
Reverse Transfer Capacitance	C_{rss}			2	10		
Drain-Source Capacitance	C_{ds}			30			
Switching^d							
Turn-On Time	t_{ON}	$V_{DD} = 25\ \text{V}, R_L = 23\ \Omega$ $I_D \cong 1\ \text{A}, V_{GEN} = 10\ \text{V}$ $R_G = 25\ \Omega$		6	10	ns	
Turn-Off Time	t_{OFF}			8	10		

Notes

- $T_A = 25^\circ\text{C}$ unless otherwise noted.
- For DESIGN AID ONLY, not subject to production testing.
- Pulse test: $PW \leq 300\ \mu\text{s}$ duty cycle $\leq 2\%$.
- Switching time is essentially independent of operating temperature.
- For typical characteristics curves see the 2N6661/VN88AFD data sheet.

VNDQ09