TOPAZ SEMICONDUCTOR

SD2200

N-CHANNEL DEPLETION-MODE D-MOS FET

ORDERING INFORMATION

TO-206AF (TO-72) Hermetic Package	SD2200DE
with Shorting Ring on leads	SD2200DE/R
Description	20V, 75Ω

FEATURES

- Normally ON Configuration
- Low Interelectrode Capacitances
- High-Speed Switching
- Pin and Function Compatible to Industry Standard J-FETs with addition of Substrate Bias Pin

APPLICATIONS

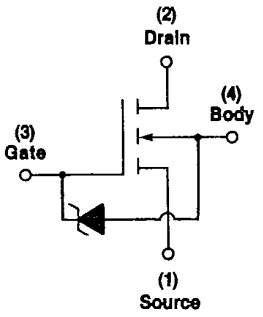
- High-Speed Analog Switches
- Wide-Band RF Amplifiers
- Cascode Amplifiers

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

V_{DS} Drain-Source Voltage ..... +20V
V_{SD} Source-Drain Voltage ..... +10V
V_{DB} Drain-Body Voltage ..... +25V
V_{SB} Source-Body Voltage ..... +15V
V_{GD} Gate-Drain Voltage ..... +25V
V_{GS} Gate-Source Voltage ..... +25V
V_{GB} Gate-Body Voltage ..... +25V

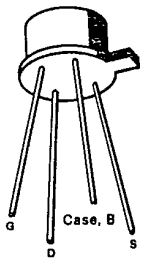
I_D Continuous Drain Current ..... +100 mA
P_D Total Device Dissipation ..... 360 mW
Derating Factor ..... 2.88 mW/°C
T_j Operating Junction Temperature Range ..... -55 to +150°C
T_S Storage Temperature Range ..... -55 to +150°C
T_L Lead Temperature (1/16" from mounting surface for 10 sec.) ..... +260°C

SCHEMATIC DIAGRAM



Body internally connected to Case

PIN CONFIGURATION



PACKAGE DIMENSIONS (TO-72) TO-206AF

(See Package 3)

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ELECTRICAL CHARACTERISTICS (T_A = +25°C, per side, unless otherwise noted)

#		CHARACTERISTIC		MIN	TYP	MAX	UNITS	TEST CONDITIONS	
1	STATIC	BV_{DS}	Drain-Source Breakdown Voltage	20			V	I_D = 20nA, V_{GS} = V_{BS} = -5V	
2		BV_{SD}	Source-Drain Breakdown Voltage	10				I_S = 20nA, V_{GD} = V_{BD} = -5V	
3		BV_{DB}	Drain-Body Breakdown Voltage	25				I_D = 20nA, V_{GB} = 0 Source Open	
4		BV_{SB}	Source-Body Breakdown Voltage	15				I_S = 10μA, V_{GB} = 0 Drain open	
5		$I_{GSS(fwd)}$	Forward Gate Leakage Current			2.0	nA	V_{GS} = 25V, V_{DS} = V_{BS} = 0	
6		I_G	Gate Operating Current		-6.0	-100	pA	V_{DG} = 20V, I_D = 5.0 mA, V_{BS} = -5.6V	
7					-1.4	-10	nA	V_{BS} = -5.6V	T_A = +125°C
8		$V_{GS(off)}$	Gate-Source Cutoff Voltage	-1.0		-5.0	V	V_{DS} = 10V, I_D = 2.0μA, V_{BS} = -5.6V	
9		$V_{GS(on)}$	Gate-Source[1] ON Voltage	-0.3		-3.0		V_{DG} = 10V, I_D = 10mA, V_{BS} = -5.6V	
10		I_{DSX}	Zero Gate Voltage[1] Drain Current	14		60	mA	V_{DS} = 10V, V_{GS} = 0, V_{BS} = -5.6V	
11				10					T_A = +125°C
12		$r_{DS(ON)}$	Drain-Source ON Resistance		50	75	ohms	I_D = 1.0mA, V_{GS} = 0, V_{BS} = -5.6V	
13	DYNAMIC	g_{fs}	Common-Source[1] Forward Transconductance	10	15	20	mmhos	V_{DG} = 10V, I_D = 10 mA, V_{BS} = -5.6V	f = 1 KHz
14		g_{os}	Common-Source Output Conductance		380	600	μmhos		
15		C_{iss}	Common-Source Input Capacitance		7.0		pF		f = 1 MHz
16		C_{oss}	Common-Source Output Capacitance		2.4				
17		C_{rss}	Common-Source Reverse Transfer Capacitance		0.6				
18		$C_{(gs+sb)}$	Source Node Capacitance		9.0				

Note 1: Pulse Test, 80μsec, 1% Duty Cycle

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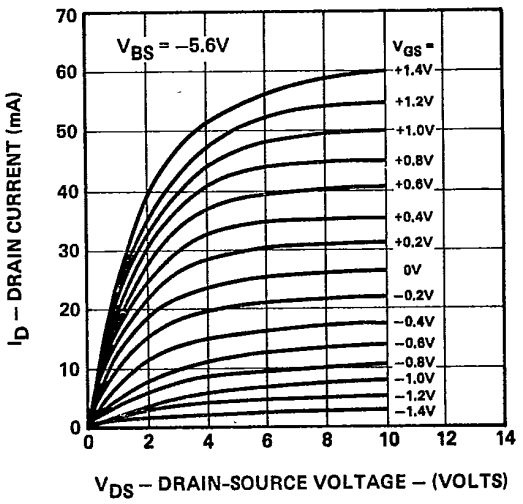
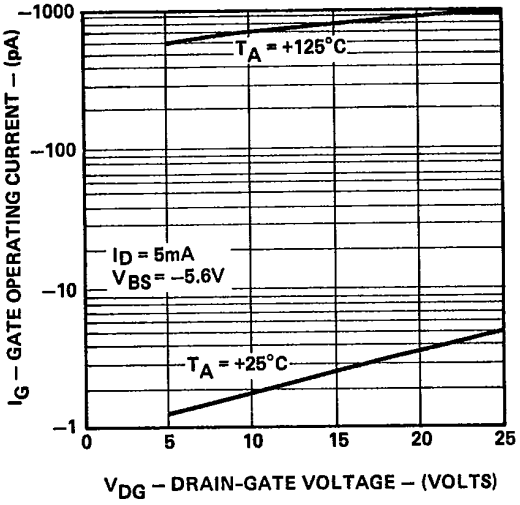
TYPICAL PERFORMANCE CHARACTERISTICS (T_A = +25°C unless otherwise specified)

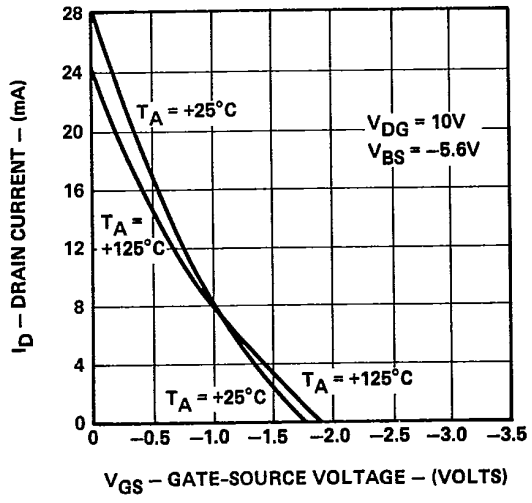
OUTPUT CHARACTERISTIC



GATE OPERATING CURRENT —VS— DRAIN-GATE VOLTAGE



TRANSFER CHARACTERISTIC



FORWARD TRANSCONDUCTANCE —VS— DRAIN CURRENT