TOPAZ SEMICONDUCTOR

T-31-25

SD2204

P-CHANNEL ENHANCEMENT MODE D-MOS FET

ORDERING INFORMATION

Sorted Chips in Conductive Waffle Pack	SD2204CHP
TO-226AA (TO-92) Plastic Package	SD2204BD
Description	-400V, 700Ω

FEATURES

- Ultra-Low Channel OFF Leakage, <-500pA
- Low Interelectrode Capacitances
- N-Channel Complements available, SD1201
- Gate Standoff Voltage, ±40V min.

APPLICATIONS

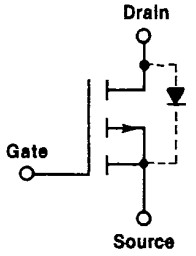
- High-Voltage Drivers
- High-Voltage Level Translators
- Reed Relay Replacements

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

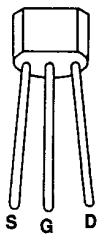
Drain-Source Voltage ..... -400V
Drain-Gate Voltage ..... -400V
Gate-Source Voltage ..... ±40V
Operating and Storage Temperature Range ..... -55 to +125°C
Lead Temperature (1/16" from mounting Surface for 10 sec.) ..... +260°C

	T_A = +25°C	T_C = +25°C
Continuous Drain Current	-15mA	-25mA
Continuous Device Dissipation	0.30W	1.0W
Linear Derating Factor	3.0mW/°C	10mW/°C

PIN CONFIGURATION

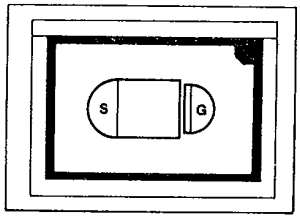


TO-226AA
(TO-92)



(See Package 5)

CHIP CONFIGURATION



Dimensions: .025 × .035 × .020 in.
Drain is backside contact.

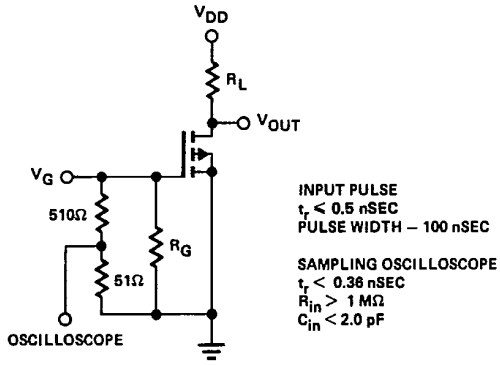
TOPAZ SEMICONDUCTOR

SD2204

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

#		CHARACTERISTIC		MIN	TYP	MAX	UNIT	TEST CONDITIONS
1	STATIC	BV_{DSS}	Drain-Source Breakdown Voltage	-400			V	I_D=-100μA, V_{GS} = 0
2				-400				I_D=-1.0μA
3		I_{DSS}	Drain-Source OFF Leakage Current		-80	-500	pA	V_{DS} = -100V, V_{GS} = 0
4		I_{GBS}	Gate-Body Leakage Current			±1.0	nA	V_{GB} = ±20V, V_{DS} = 0
5						±1.0	μA	V_{GB} = ±40V, V_{DS} = 0
6		$V_{GS(th)}$	Gate-Source Threshold Voltage	-2.0		-5.0	V	V_{DS} = V_{GS}, I_D = -0.5mA
7		$r_{DS(on)}$	Drain-Source ON Resistance		500	700	ohms	I_D = -10mA, V_{GS} = -10V
8		$I_{D(on)}$	Drain-Source ON Current	-15	-40		mA	V_{DS} = -25V, V_{GS} = -10V
9	DYNAMIC	g_{fs}	Common-Source Forward Transconductance	3.0	7.5		mmhos	V_{DS} = -25V, I_D = -5mA f = 1KHz
10		C_{iss}	Common-Source Input Capacitance		8.0	10	pF	V_{DS} = -25V, V_{GS} = 0, f = 1MHz
11		C_{oss}	Common-Source Output Capacitance		1.5	2.0		
12			Common-Source Reverse Transfer Capacitance		0.8	1.0		
13		$t_{d(on)}$	Turn-ON Delay Time		6		nS	V_{DD} = -25V, $V_{G(on)}$ = -10V R_L = 500Ω R_G = 51Ω
14		t_r	Rise time		6			
15		$t_{d(off)}$	Turn-OFF Delay Time		8			
16		t_f	Fall Time		6			

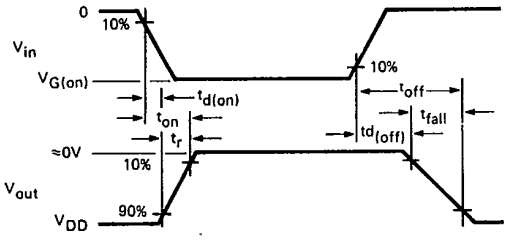
SWITCHING TIME TEST CIRCUIT



INPUT PULSE
t_r < 0.5 nSEC
PULSE WIDTH – 100 nSEC

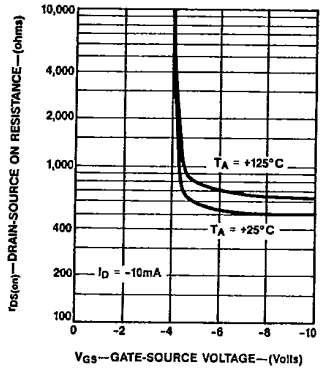
SAMPLING OSCILLOSCOPE
t_r < 0.36 nSEC
R_{in} > 1 MΩ
C_{in} < 2.0 pF

TEST WAVEFORMS

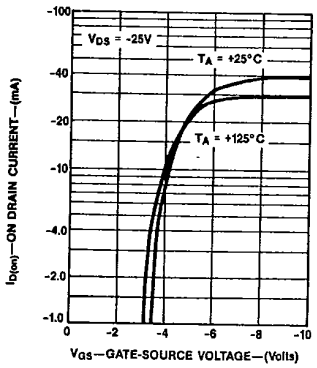


TYPICAL PERFORMANCE CHARACTERISTICS (T_A = +25°C per channel, unless otherwise noted)

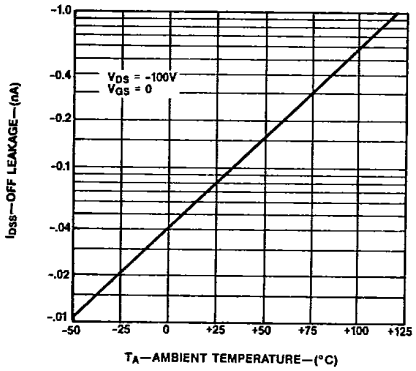
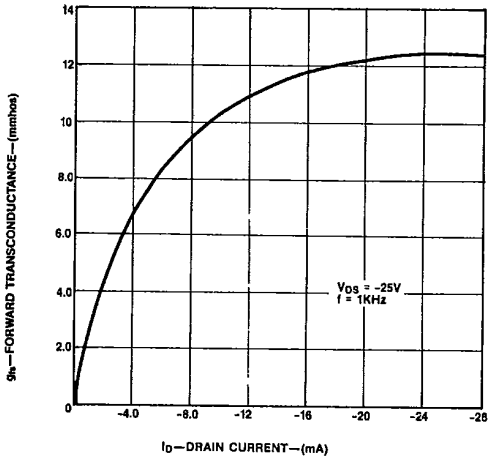
DRAIN-SOURCE ON RESISTANCE —VS— GATE-SOURCE VOLTAGE



ON DRAIN CURRENT —VS— GATE-SOURCE VOLTAGE



DRAIN-SOURCE OFF LEAKAGE CURRENT —VS— AMBIENT TEMPERATURE



FORWARD TRANSCONDUCTANCE —VS— ON DRAIN CURRENT