T-43-25

TOPAZ SEMICONDUCTOR

SD1107, SD1117

N-CHANNEL ENHANCEMENT-MODE D-MOS POWER FETs

ORDERING INFORMATION

Configuration	Single	Quad	Single	Quad
Sorted Chips in Waffle Pack	SD1107CHP	—	SD1117CHP	—
TO-206AA (TO-18) Package	SD1107DD	—	SD1117DD	—
TO-205AF (TO-39) Package	SD1107HD	—	SD1117HD	—
TO-226AA (TO-92) Package	SD1107BD	—	SD1117BD	—
14-Pin Plastic DIP	—	SD1107N	—	SD1117N
Description	100V, 4.0 ohm		60V, 2.5 ohm	

FEATURES

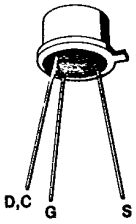
- Gate Standoff Voltage, ±40V min.
- Available in a wide variety of packages
- Low Capacitance
- Low ON Resistance
- P-Channel Complements Available, SD2107

APPLICATIONS

- High-Speed Pulse Amplifiers
- CMOS Logic to High-Current Interfaces
- High-Speed Switching
- Line Drivers

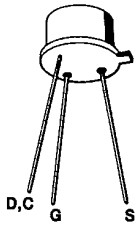
PIN CONFIGURATIONS

TO-206AA (TO-18)



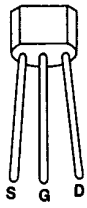
(See Package 1)

TO-205AF (TO-39)



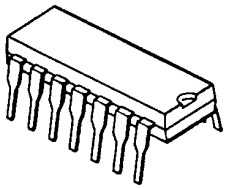
(See Package 6)

TO-226AA (TO-92)

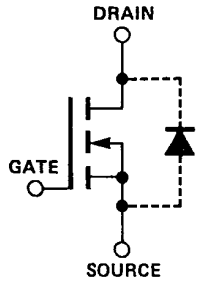


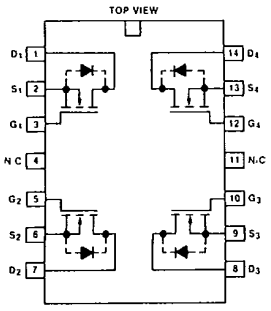
(See Package 5)

14-Pin Plastic DIP



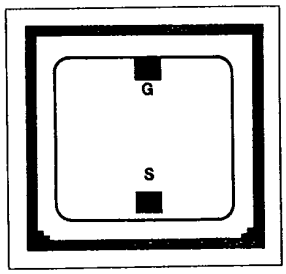
(See Package 9)





SD1107N SD1117N
4 Isolated Chips per Package

CHIP CONFIGURATION



Dimensions: .054 × .051 × .020 in.
Drain is backside contact.

TOPAZ SEMICONDUCTOR

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

Drain-Source Voltage
- SD1107 ..... 100V
- SD1117 ..... 60V

Drain-Gate Voltage (R_{GS} = 1MΩ)
- SD1107 ..... 100V
- SD1117 ..... 60V

Gate-Source Voltage ..... ±40V

Continuous Drain Current

	T_C = +100°C	T_C = +25°C
SD1107BD	0.3A	0.4A
SD1107DD	0.4A	0.5A
SD1107HD	0.6A	1.0A
SD1117BD	0.3A	0.5A
SD1117DD	0.4A	0.6A
SD1117HD	0.8A	1.2A

Peak Pulsed Drain Current 2.0A

Maximum Power Dissipation

	T_C = +100°C	T_C = +25°C
HD, TO-39 Pkg.	2.75W	6.88W
BD, TO-92 Pkg.	0.5W	1.35W
DD, TO-18 Pkg.	0.7W	1.80W

Linear Derating Factor

	Junction to Ambient (mW/°C)	Junction to Ambient (mW/°C)
HD, TO-39 Pkg.	36.6	55
BD, TO-92 Pkg.	6.66	10.8
DD, TO-18 Pkg.	9.33	14.4

Operating Junction and Storage Temperature Range ..... -55°C to +150°C

Lead Temperature (1/6" from mounting surface for 10 Sec) ..... +260°C

ABSOLUTE MAXIMUM RATINGS Quad Units in 14-Pin Plastic DIP Package (T_C = +25°C unless otherwise noted)

Drain-Source Voltage
- SD1107N 100V
- SD1117N 60V

Drain-Gate Voltage (V_{GS} = 0)
- SD1107N 100V
- SD1117N 60V

Gate-Source Voltage ..... ±0V

Continuous Drain Current

	T_C = +85°C	T_C = +25°C
Total Package		
SD1107N	0.3A	0.5A
SD1117N	0.4A	0.7A
Single Device		
SD1107N	0.2A	0.3A
SD1117N	0.3A	0.5A

Peak Pulsed Drain Current 2.0A

Continuous Device Dissipation

	T_C = +85°C	T_C = +25°C
Total Package	.64W	2.0W
Single Device	.30W	1.0W
	T_A = +25°C	T_C = +25°C
Total Package	10.6mW/°C	20mW/°C
Single Device	5.0mW/°C	10mW/°C

Operating Junction Temperature Range ..... -55°C to +125°C

Storage Temperature Range ..... -55°C to +125°C

Lead Temperature (1/16" from mounting surface for 10 Sec) ..... +260°C

TOPAZ SEMICONDUCTOR

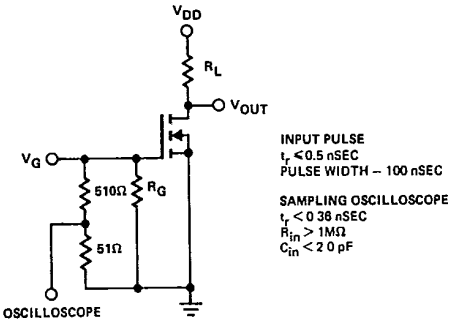
SD1107, SD1117

ELECTRICAL CHARACTERISTICS (T_C = +25°C unless otherwise noted)

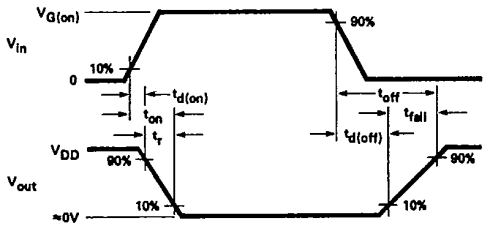
#		CHARACTERISTIC		SD1107 MIN	SD1107 TYP	SD1107 MAX	SD1117 MIN	SD1117 TYP	SD1117 MAX	UNIT	TEST CONDITIONS	
1	STATIC	BV_{DSS}	Drain Source Breakdown Voltage	100	130		60	90		V	I_D = 10μA, V_{GS} = 0	
2	STATIC	I_{GSSF}	Gate Forward Leakage Current		.03	10		.03	10	nA	V_{GS} = 20V	V_{DS} = 0
3	STATIC	I_{GSSR}	Gate Reverse Leakage Current		-.03	-10		-.03	-10	nA	V_{GS} = -20V	V_{DS} = 0
4	STATIC	I_{DSS}	Drain-Source OFF Leakage Current		2.0	200				nA	V_{DS} = 80V, V_{GS} = 0	
5	STATIC	I_{DSS}	Drain-Source OFF Leakage Current			2.0				μA	V_{DS} = 80V, V_{GS} = 0	T_C = +125°C
6	STATIC	I_{DSS}	Drain-Source OFF Leakage Current					2.0	200	nA	V_{DS} = 48V, V_{GS} = 0	
7	STATIC	I_{DSS}	Drain-Source OFF Leakage Current						2.0	μA	V_{DS} = 48V, V_{GS} = 0	T_C = +125°C
8	STATIC	$V_{GS(th)}$	Gate Source Threshold Voltage	0.8		2.0	0.8		2.0	V	I_D = 1mA, V_{DS} = V_{GS}	
9	STATIC	$I_{D(ON)}$	ON Drain Current[1]	2.0	3.0		2.0	3.0		A	V_{DS} = 10V, V_{GS} = 10V	
10	STATIC	$r_{DS(ON)}$	Drain-Source ON Resistance[1]		3.0	5.0		3.0	4.5	ohms	V_{GS} = 5V, I_D = 0.3A	
11	STATIC	$r_{DS(ON)}$	Drain-Source ON Resistance[1]			8.5			7.6	ohms	V_{GS} = 5V, I_D = 0.3A	T_C = 125°C
12	STATIC	$r_{DS(ON)}$	Drain-Source ON Resistance[1]		1.9	4.0		1.9	2.5	ohms	V_{GS} = 10V, I_D = 1.0A	
13	STATIC	$r_{DS(ON)}$	Drain-Source ON Resistance[1]			6.8			4.3	ohms	V_{GS} = 10V, I_D = 1.0A	T_C = +125°C
14	DYNAMIC	g_{fs}	Forward Transconductance[1]	400	580		400	580		mS	V_{DS} = 10V, I_D = 0.5A, f = 1KHz	
15	DYNAMIC	C_{iss}	Common-Source Input Capacitance		80	100		80	100	pF	V_{DS} = 25V, V_{GS} = 0, f = 1MHz	
16	DYNAMIC	C_{rss}	Common-Source Reverse Transfer Capacitance		1.3	2.5		1.3	2.5	pF	V_{DS} = 25V, V_{GS} = 0, f = 1MHz	
17	DYNAMIC	C_{oss}	Common-Source Output Capacitance		10.5	15		10.5	15	pF	V_{DS} = 25V, V_{GS} = 0, f = 1MHz	
18	DYNAMIC	t_{on}	Turn-On Time		4.0	6.0		4.0	6.0	nSec	V_{DD} = 25V, R_L = 25 ohms, R_G = 51 ohms, $V_{G(on)}$ = 10V	
19	DYNAMIC	t_{off}	Turn-Off Time		4.0	6.0		4.0	6.0	nSec	V_{DD} = 25V, R_L = 25 ohms, R_G = 51 ohms, $V_{G(on)}$ = 10V	

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

SWITCHING TIMES TEST CIRCUIT



TEST WAVEFORMS



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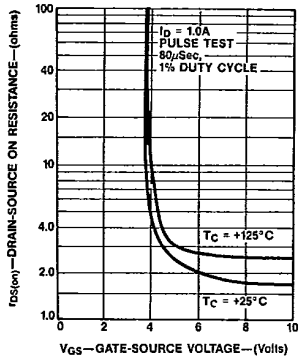
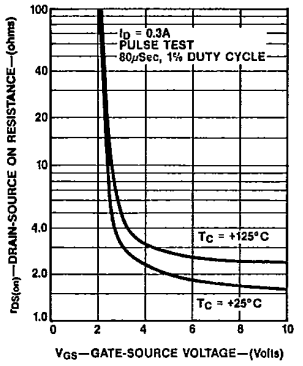
TYPICAL PERFORMANCE CHARACTERISTICS (T_C = +25°C unless otherwise noted)

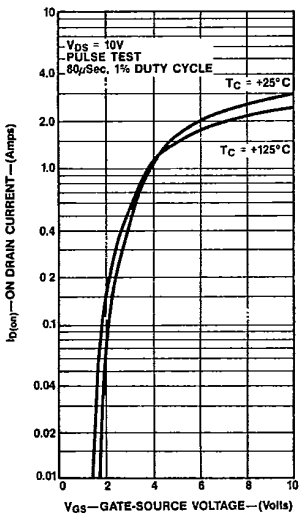
DRAIN-SOURCE ON RESISTANCE —VS— GATE-SOURCE VOLTAGE



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



ON DRAIN CURRENT —VS— GATE-SOURCE VOLTAGE



FORWARD TRANSCONDUCTANCE —VS— ON DRAIN CURRENT