TOPAZ SEMICONDUCTOR

AN0110N, AN0120N AN0130N, AN0140N

N-CHANNEL ENHANCEMENT MODE D-MOS FETs 8-CHANNEL ARRAYS

T-43-25

ORDERING INFORMATION

18 Pin Plastic DIP	AN0110NA	AN0120NA	AN0130NA	AN0140NA
Description (each channel)	100V,100Ω	200V,300Ω	300V,300Ω	400V,350Ω

FEATURES

- Ultra-Low Channel OFF Leakage, <800pA
- High Channel-to-Channel Isolation
- 100V to 400V Capability
- Industry Standard Pin-Out

APPLICATIONS

- Electrostatic Array Drivers
- Electroluminescent Panel Drivers
- Converters
- Multi-Channel Array Drivers

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

Drain-Source Voltage
- AN0110N ..... +100V
- AN0120N ..... +200V
- AN0130N ..... +300V
- AN0140N ..... +400V

Drain-Gate Voltage (V_{GS}=0)
- AN0110N ..... +100V
- AN0120N ..... +200V
- AN0130N ..... +300V
- AN0140N ..... +400V

Channel-to-Channel Isolation Voltage
Drain-to-Drain Voltage (V_{GS}=0)
- AN0110N ..... +100V
- AN0120N ..... +200V
- AN0130N ..... +300V
- AN0140N ..... +400V

Gate-Source Voltage ..... ±30V

Operating and Storage Temperature Range ..... -55 to +85°C

Lead Temperature (1/16" from mounting Surface for 10 sec.) ..... +300°C

Continuous Drain Current, Total Package

	T_A = +25°C	T_C = +25°C
AN0110N	80mA	140mA
AN0120N,AN0130N	50mA	80mA
AN0140N	40mA	75mA

Continuous Drain Current, Single Channel

	T_A = +25°C	T_C = +25°C
AN0110N	50mA	100mA
AN0120N,AN0130N	30mA	60mA
AN0140N	25mA	50mA

Continuous Device Dissipation

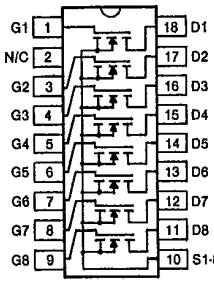
	T_A = +25°C	T_C = +25°C
Total Package	.64W	2.0W
Single Channel	.30W	1.0W

Linear Derating Factor

	T_A = +25°C	T_C = +25°C
Total Package	10.67mW/°C	33.2mW/°C
Single Channel	5mW/°C	16.6mW/°C

PIN CONFIGURATION & SCHEMATIC DIAGRAM

TOP VIEW



PACKAGE DIMENSIONS

18-Pin Plastic DIP
(See Package 11)

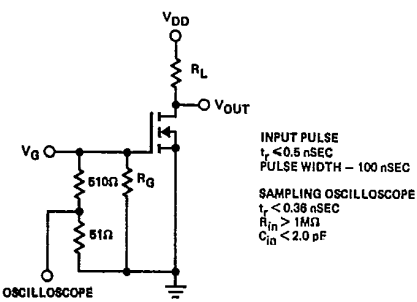
T-43-25

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

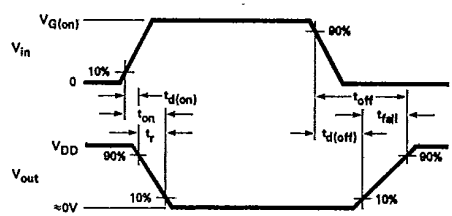
#		CHARACTERISTIC			MIN	TYP	MAX	UNIT	TEST CONDITIONS
1	STATIC	BV_{DSS}	Drain-Source Breakdown Voltage	AN0110	100	160		V	I_D = 100μA, V_{GS} = 0
2				AN0120	200	300			
3				AN0130	300	400			
4				AN0140	400	450			
5		I_{DSS}	Drain-Source OFF Leakage Current	AN0110			5.0	nA	V_{DS} = 80V, V_{GS} = 0 (NOTE 1)
6				AN0120			5.0		
7				AN0120			5.0		V_{DS} = 100V, V_{GS} = 0 (NOTE 1)
8				AN0140			5.0		
9		I_{GBS}	Gate-Body Leakage Current				10	nA	V_{GS} = 20V, V_{DS} = 0
10		$V_{GS(th)}$	Gate-Source Threshold Voltage		2.0		5.0	V	V_{DS} = V_{GS}, I_D = 1.0mA
11		$r_{DS(on)}$	Drain-Source ON Resistance	AN0110		60	100	ohms	I_D = 10mA, V_{GS} = 10V
12				AN0120		210	300		
13				AN0130		260	300		
14				AN0140		325	350		
15		$I_{D(on)}$	Drain-Source ON Current	AN0110	50			mA	V_{DS} = 25V, V_{GS} = 10V
16				AN0120	25				
17				AN0130	25				
18				AN0140	25				
19	DYNAMIC	g_{fs}	Common-Source Forward Transcond	AN0110	8.0			mmhos	V_{DS} = 25V, I_D = 10mA, f = 1KHz
20				AN0120	4.0				
21				AN0130	4.0				
22				AN0140	4.0				
23		c_{iss}	Common-Source Input Capacitance			8.0	10	pF	V_{DS} = 25V, V_{GS} = 0, f = 1MHz
24		c_{oss}	Common-Source Output Capacitance			1.5	2.0		
25		c_{rss}	Common-Source Reverse Transfer Capacitance			0.8	1.0		
26		$t_{d(on)}$	Turn-ON Delay Time			3		nS	V_{DD} = 25V, $V_{G(on)}$ = 10V, R_L = 820Ω R_G = 51Ω
27		t_r	Rise Time			3			
28		$t_{d(off)}$	Turn-OFF Delay Time			5			
29		t_f	Fall Time			5			

Note 1: Limit is OFF leakage of all 8 segments in parallel.

SWITCHING TIMES TEST CIRCUIT

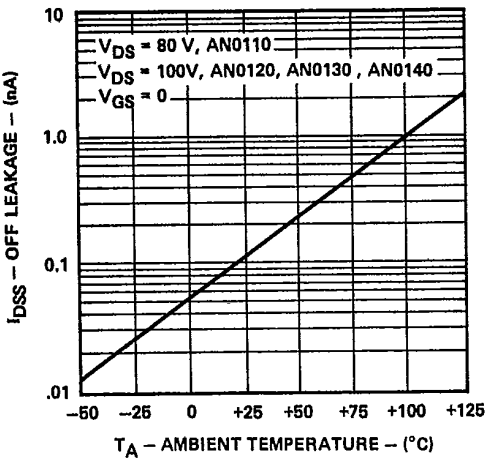


TEST WAVEFORMS

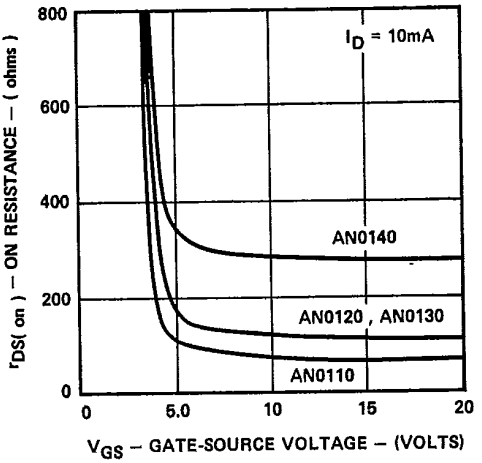


TYPICAL PERFORMANCE CHARACTERISTICS (T_A = +25°C, per channel, unless otherwise specified)

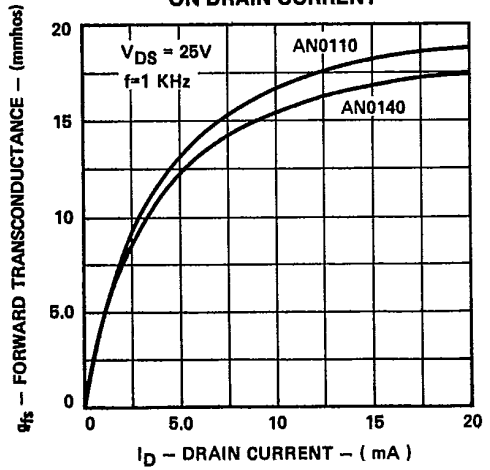
DRAIN-SOURCE OFF LEAKAGE —VS— AMBIENT TEMPERATURE



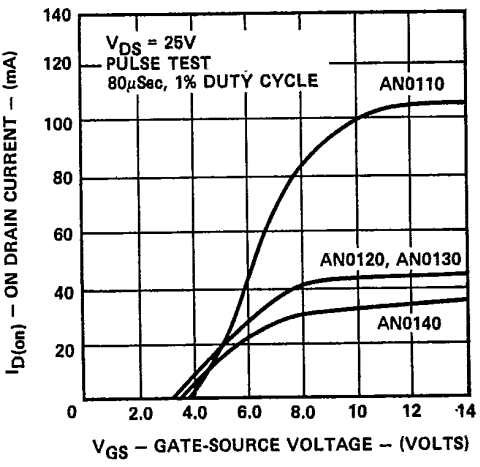
DRAIN-SOURCE ON RESISTANCE —VS— GATE-SOURCE VOLTAGE



FORWARD TRANSCONDUCTANCE —VS— ON DRAIN CURRENT



ON DRAIN CURRENT —VS— GATE-SOURCE VOLTAGE



T-43-25

TOPAZ SEMICONDUCTOR

AP0120N, AP0130N, AP0140N

P-CHANNEL ENHANCEMENT MODE D-MOS FETs 8-CHANNEL ARRAYS

ORDERING INFORMATION

18 Pin Plastic DIP	AP0120NA	AP0130NA	AP0140NA
Description (each channel)	-200V, 600Ω	-300V, 600Ω	-400V, 700Ω

FEATURES

- Ultra-Low Channel OFF Leakage, <-800pA
- High Channel-to-Channel Isolation
- N-Channel Complements available
- Industry Standard Pin-Out

APPLICATIONS

- Electrostatic Array Drivers
- Electroluminescent Panel Drivers
- Converters
- Multi-Channel Array Drivers

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

Drain-Source Voltage

AP0120N	-200V
AP0130N	-300V
AP0140N	-400V

Drain-Gate Voltage (V_{GS} = 0)

AP0120N	-200V
AP0130N	-300V
AP0140N	-400V

Channel-to-Channel Isolation Voltage

Drain-to-Drain Voltage (V_{GS} = 0)

AP0120N	-200V
AP0130N	-300V
AP0140N	-400V

Gate-Source Voltage ..... ±40V

Operating and Storage Temperature Range ..... -55 to +85°C

Lead Temperature (1/16" from mounting Surface for 10 sec.) ..... +300°C

Continuous Drain Current, Total Package

	T_A = +25°C	T_C = +25°C
AP0120N, AP0130N	-25mA	-40mA
AP0140N	-20mA	-35mA

Continuous Drain Current, Single Channel

	T_A = +25°C	T_C = +25°C
AP0120N, AP0130N, AP0140N	-15mA	-25mA

Continuous Device Dissipation

	T_A = +25°C	T_C = +25°C
Total Package	.64W	2.0W
Single Channel	.30W	1.0W

Linear Derating Factor

	T_A = +25°C	T_C = +25°C
Total Package	10.67mW/°C	33.2mW/°C
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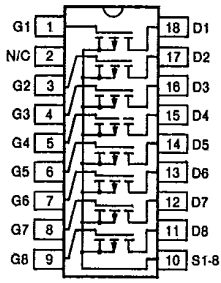
PIN CONFIGURATION & SCHEMATIC DIAGRAM

TOP VIEW



PACKAGE DIMENSIONS

18-Pin Plastic DIP

(See Package 11)

TOPAZ SEMICONDUCTOR

AP0120N, AP0130N, AP0140N

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	AP0120N	-200			V	I_D=-100μA, V_{GS} = 0
2				AP0130N	-300				
3				AP0140N	-400				
4		I_{DSS}	Drain-Source OFF Leakage Current				-5.0	nA	V_{DS} = -100V, V_{GS} = 0 (NOTE 1)
5		I_{GSS}	Gate-Body Leakage Current				±10	nA	V_{GB} = ±20V, V_{DS} = 0
6							±1.0	μA	V_{GB} = ±40V, V_{DS} = 0
7		$V_{GS(th)}$	Gate-Source Threshold Voltage		-2.0		-5.0	V	V_{DS} = V_{GS}, I_D = -0.5mA
8		$r_{DS(on)}$	Drain-Source ON Resistance	AP0120N, AP0130N			600	ohms	I_D = -10mA, V_{GS} = -10V
9				AP0140N			700		
10		$I_{D(on)}$	Drain-Source ON Current		-15			mA	V_{DS} = -25V,V_{GS} = -10V
11	DYNAMIC	g_{fs}	Common-Source Forward Transconductance		3.0			mmhos	V_{DS} = -25V, I_D = -5mA f = 1KHz
12		C_{iss}	Common-Source Input Capacitance			8.0	10	pF	V_{DS} = -25V, V_{GS} = 0, f = 1MHz
13		C_{oss}	Common-Source Output Capacitance			1.5	2.0		
14			Common-Source Reverse Transfer Capacitance			0.8	1.0		
15		$t_{d(on)}$	Turn-ON Delay Time			6		nS	V_{DD} = -25V, $V_{G(on)}$ = -10V R_L = 500Ω R_G = 51Ω
16		t_r	Rise time			6			
17		$t_{d(off)}$	Turn-OFF Delay Time			8			
18		t_f	Fall Time			6			

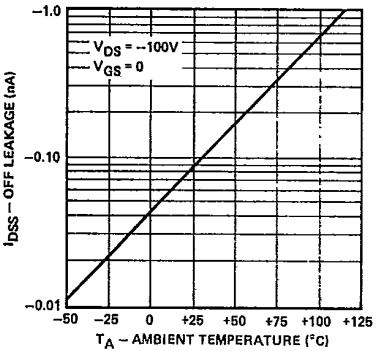
Note 1: Limit is OFF leakage of all 8 segments in parallel.

TOPAZ SEMICONDUCTOR

AP0120N, AP0130N, AP0140N

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

DRAIN-SOURCE OFF LEAKAGE —vs— AMBIENT TEMPERATURE



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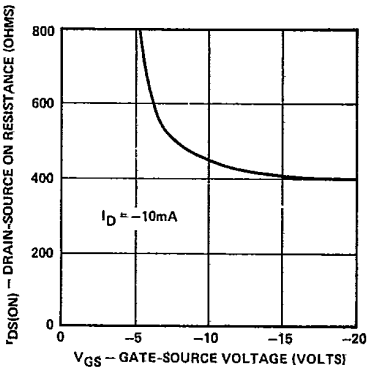
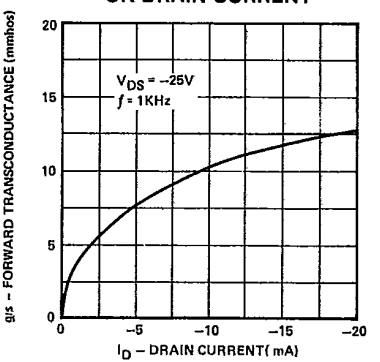


FORWARD TRANSCONDUCTANCE —vs— ON DRAIN CURRENT



ON DRAIN CURRENT —vs— GATE-SOURCE VOLTAGE