8-Channel MOSFET Array
Monolithic P-Channel Enchancement Mode

Ordering Information

BV_{DSS}/ BV_{DGS} (min)	$R_{DS(ON)}$ (max)	$I_{D(ON)}$ (min)	I_{DSS}** @ V_{DS} = -100V Max	I_{DSS}** @ V_{DS} = -250V Max	Order Number / Package		
					18-Lead Plastic DIP	Plastic SOW-20*	Die†
-160V	700Ω	-15mA	-1.5nA	—	AP0116NA	AP0116WG	AP0116ND
-200V	600Ω	-15mA	—	—	AP0120NA	—	AP0120ND
-300V	600Ω	-15mA	—	—	AP0130NA	—	AP0130ND
-320V	700Ω	-15mA	—	-1.5nA	AP0132NA	AP0132WG	AP0132ND
-400V	700Ω	-15mA	—	—	AP0140NA	AP0140WG	AP0140ND

* Same as SO-20 with 300 mil wide body.
** Average current per channel, measured with all eight channels connected in parallel.
† MIL visual screening available

Features

- ☐ Low drain to source leakage for AP0116 and AP0132
- ☐ 160-volt to 400-volt capability
- ☐ Interfaces directly to CMOS logic
- ☐ 8 independent channels
- ☐ Low crosstalk between channels
- ☐ Low power dissipation
- ☐ Free from secondary breakdown

General Description

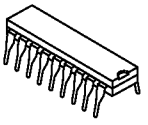
The Supertex AP01 series of high voltage arrays is designed to provide interface between CMOS logic and loads requiring high voltages and intermediate currents. Each circuit consists of eight channels in a common-source configuration with open drains. This design minimizes the number of package leads needed.

The AP0116 and AP0132 are ideally suited for low leakage/high impedance measurement, providing excellent accuracy and resolution for automatic test equipment.

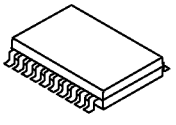
Applications

- ☐ High voltage electroluminescent panel drivers
- ☐ High voltage electrostatic array drivers
- ☐ General multi-channel driver array

Package Options



18-Lead DIP



SOW-20

Absolute Maximum Ratings

Drain-to-Source Voltage	BV_{DSS}
Drain-to-Gate Voltage	BV_{DGS}
Gate-to-Source Voltage	± 20V
Operating and Storage Temperature	-55°C to +150°C
Soldering Temperature*	300°C
Channel-to-Channel Crosstalk	10mV/V

* Distance of 1.6 mm from case for 10 seconds.

Thermal Characteristics

Package	I_D (continuous)*	I_D (pulsed)*	Power Dissipation @ T_C = 25°C	θ_{ja} °C/W	θ_{jc} °C/W	I_{DR}	I_{DRM}*
18 lead plastic	-15mA	-40mA	1.5W	135	83	-15mA	-40mA
SOW - 20	-15mA	-40mA	1.4W	110	89	-15mA	-40mA

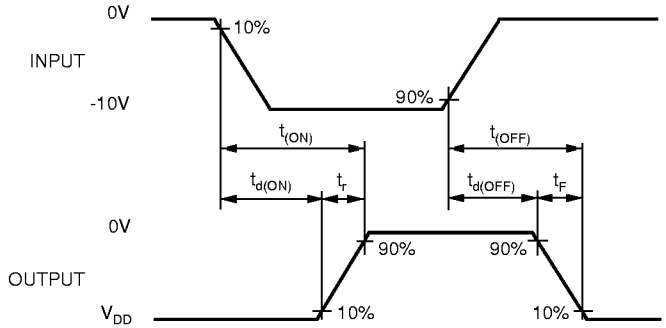
* I_D (continuous) is limited by max rated T_j.

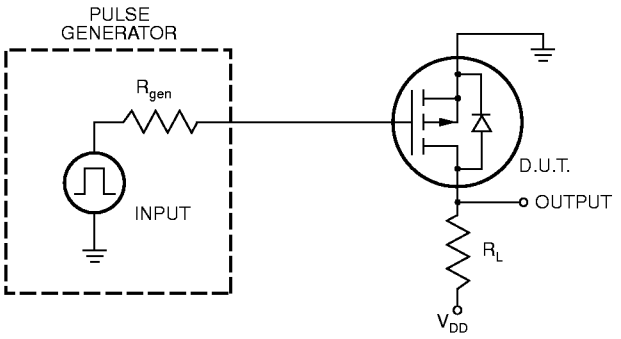
Electrical Characteristics (@ 25°C unless otherwise specified)

Symbol	Parameter		Min	Typ	Max	Unit	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	AP0116	-160			V	V_{GS} = 0, I_D = -100µA
		AP0120	-200				
		AP0130	-300				
		AP0132	-320	-380			
		AP0140	-400				
$V_{GS(th)}$	Gate Threshold Voltage		-2		-5	V	V_{GS} = V_{DS}, I_D = -1mA
$\Delta V_{GS(th)}$	Change in $V_{GS(th)}$ with Temperature			-3.5		mV/°C	V_{GS} = V_{DS}, I_D = -1mA
I_{GSS}	Gate Body Leakage	AP0120 AP0130 AP0140			-10	nA	V_{GS} = ±20V, V_{DS} = 0V(3)
		AP0116 AP0132			-1	nA	V_{GS} = ±20V, V_{DS} = 0V(3)
I_{DSS}	Zero Gate Voltage Drain Current	AP0120			-1	µA	V_{GS} = 0, V_{DS} = Max Rating(3)
		AP0130 AP0140			-1	mA	V_{GS} = 0, V_{DS} = 0.8 Max Rating T_A = 125°C(3)
		AP0116			-1.5	nA	V_{GS} = 0V, V_{DS} = -100V(3)
					-3	µA	V_{GS} = 0, V_{DS} = 0.8 Max Rating T_A = 125°C(3)
		AP0132			-1.5	nA	V_{GS} = 0V, V_{DS} = -250V(3)
					-3	µA	V_{GS} = 0, V_{DS} = 0.8 Max Rating T_A = 125°C(3)
$I_{D(ON)}$	ON-State Drain Current		-15			mA	V_{GS} = -10V, V_{DS} = -25V
$R_{DS(ON)}$	Static Drain-to-Source ON-State Resistance	AP0120 AP0130			600	Ω	V_{GS}= -10V, I_D = -10mA
		AP0116 AP0132 AP0140			700	Ω	V_{GS}= -10V, I_D = -10mA
$\Delta R_{DS(th)}$	Change in $R_{DS(th)}$ with Temperature			0.8		%/°C	V_{GS} = -10V, I_D = -10mA,
G_{FS}	Forward Transconductance		3.0	5.0		m℧	V_{DS} = -25V, I_D = -5mA
C_{ISS}	Input Capacitance			5.0	7.5	pF	V_{GS} = 0, V_{DS} = -25V, f = 1MHz
C_{OSS}	Common Source Output Capacitance			3.0	5.0		
C_{RSS}	Reverse Transfer Capacitance			1.0	2.0		
$t_{d(ON)}$	Turn-ON Delay Time			3		ns	V_{DD} = -25V, I_D = -10mA R_{GEN} = 25Ω
t_r	Rise Time			3			
$t_{d(OFF)}$	Turn-OFF Delay Time			5			
t_f	Fall Time			3			
V_{SD}	Diode Forward Voltage Drop				-1.5	V	V_{GS} = 0, I_{SD} = -25mA

Notes:
1. All D.C. parameters 100% tested at 25°C unless otherwise stated. (Pulse test: 300µs pulse, 2% duty cycle.)
2. All A.C. parameters sample tested.
3. Average current per channel, measured with all 8 channels connected in parallel.

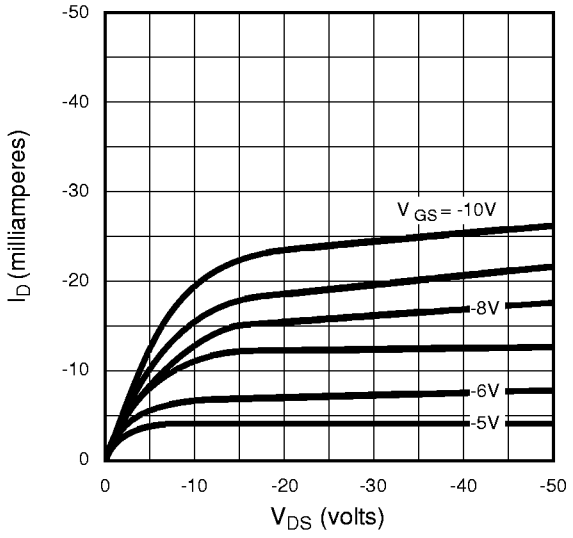
Switching Waveforms and Test Circuit



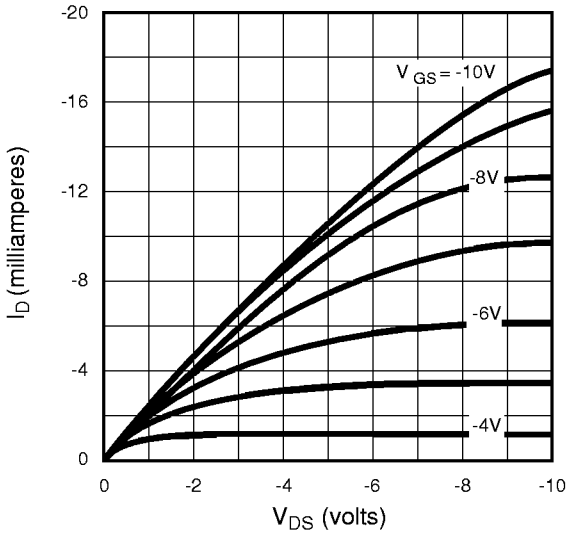


Typical Performance Curves

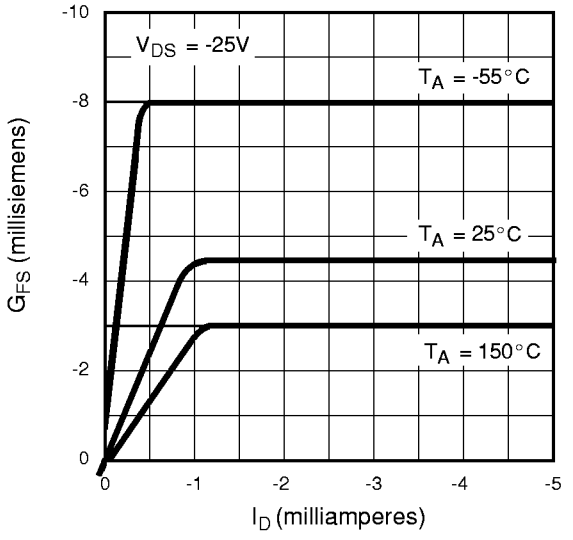
Output Characteristics



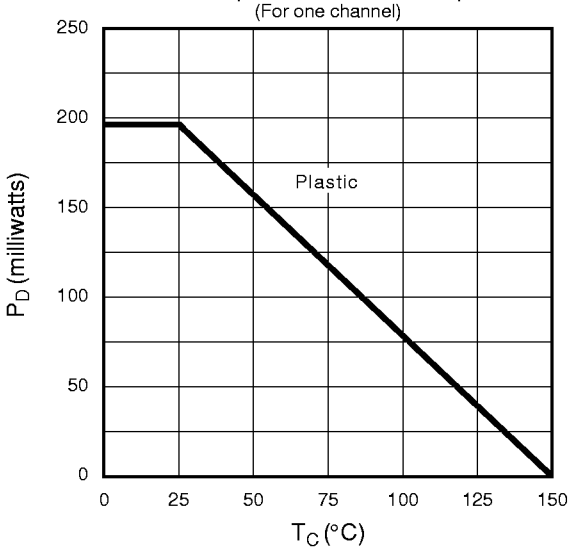
Saturation Characteristics



Transconductance vs. Drain Current

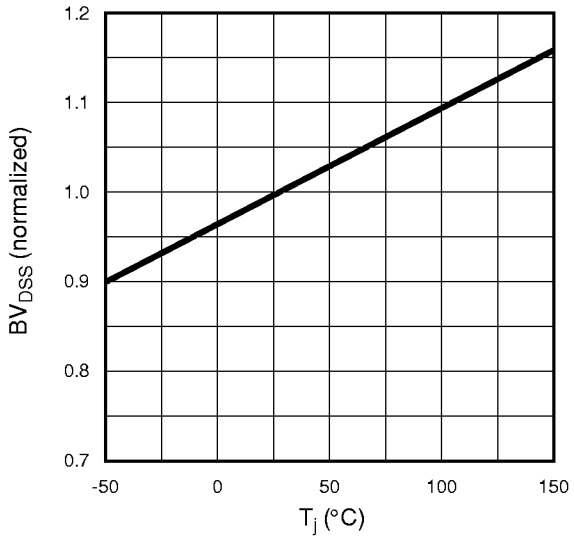


Power Dissipation vs. Case Temperature
(For one channel)

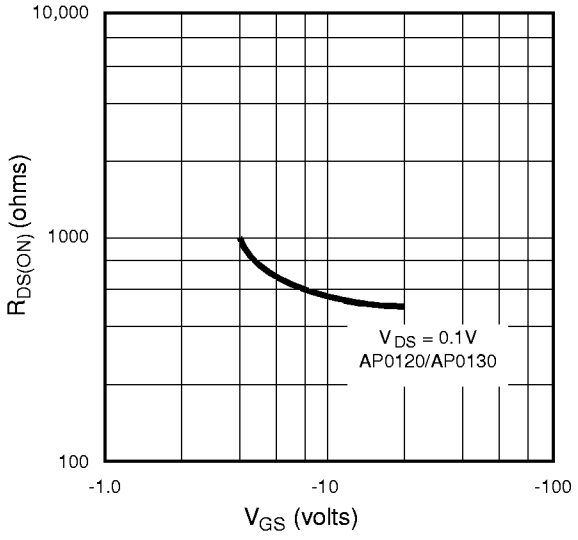


Typical Performance Curves

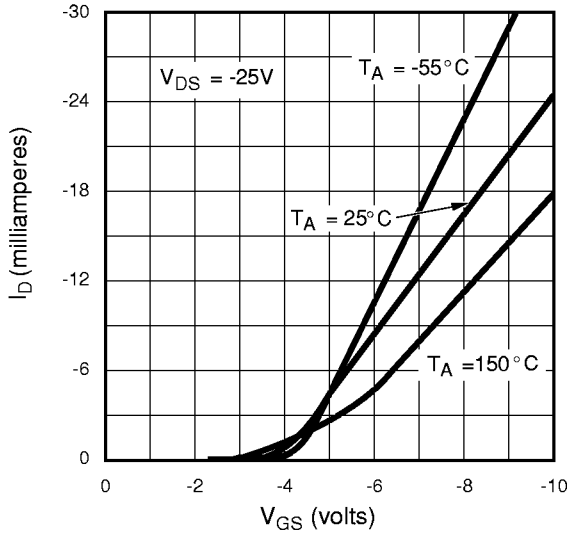
BV_{DSS} Variation with Temperature



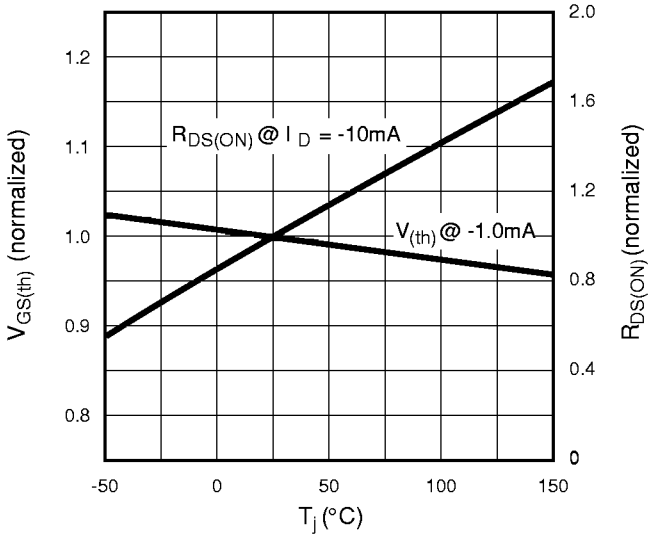
On-Resistance vs. Gate-to-Source Voltage



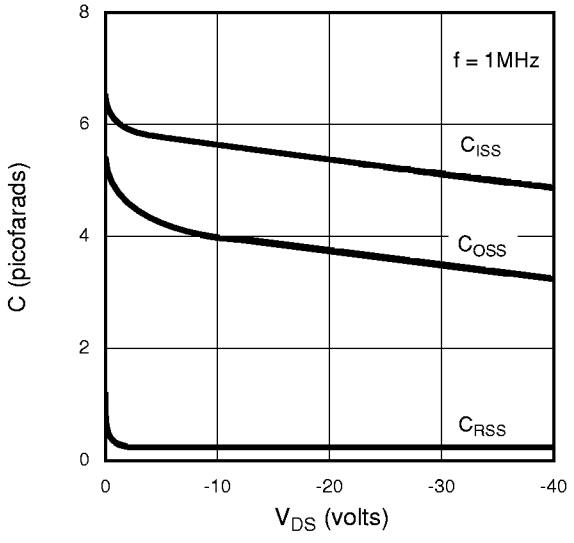
Transfer Characteristics



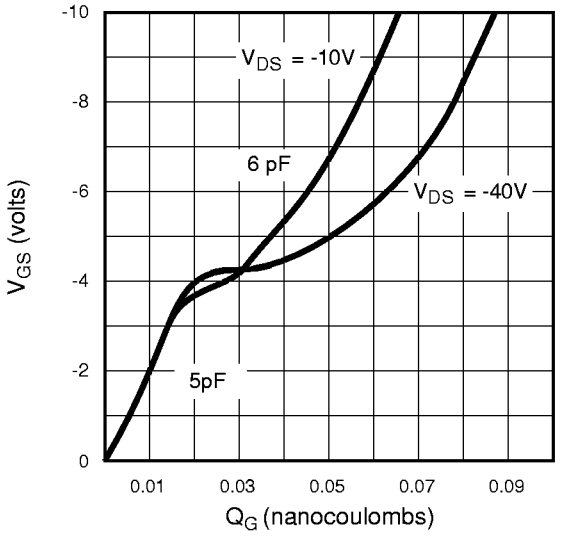
$V_{(th)}$ and R_{DS} Variation with Temperature



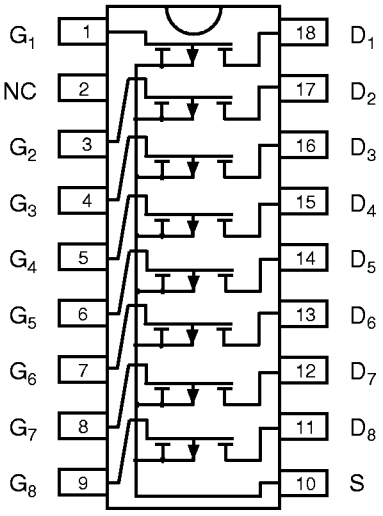
Capacitance vs. Drain-to-Source Voltage



Gate Drive Dynamic Characteristics



Pin Configuration and Schematic



top view

18-pin DIP