QUAD/DUAL N-CHANNEL MATCHED MOSFET ARRAY

GENERAL DESCRIPTION

The ALD1106/ALD1116 are monolithic quad/dual N-channel enhancement mode matched MOSFET transistor arrays intended for a broad range of precision analog applications. The ALD1106/ALD1116 offer high input impedance and negative current temperature coefficient. The transistor pairs are matched for minimum offset voltage and differential thermal response, and they are designed for switching and amplifying applications in +2V to +12V systems where low input bias current, low input capacitance and fast switching speed are desired. These MOSFET devices feature very large (almost infinite) current gain in a low frequency, or near DC, operating environment. The ALD1106/ALD1116 are building blocks for differential amplifier input stages, transmission gates, and multiplexer applications, current sources and many precision analog circuits.

FEATURES

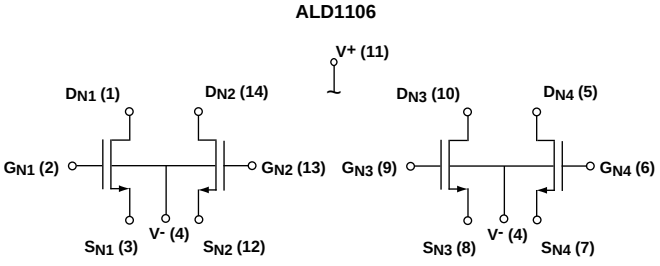
- Low threshold voltage of 0.7V
- Low input capacitance
- Low Vos 2mV typical
- High input impedance -- $10^{14}\Omega$ typical
- Negative current (I_{DS}) temperature coefficient
- Enhancement-mode (normally off)
- DC current gain 10^9
- Low input and output leakage currents

ORDERING INFORMATION

Operating Temperature Range*		
-55°C to +125°C	0°C to +70°C	0°C to +70°C
8-Pin CERDIP Package	8-Pin Plastic Dip Package	8-Pin SOIC Package
ALD1116 DA	ALD1116 PA	ALD1116 SA
14-Pin CERDIP Package	14-Pin Plastic Dip Package	14-Pin SOIC Package
ALD1106 DB	ALD1106 PB	ALD1106 SB

* Contact factory for industrial temperature range.

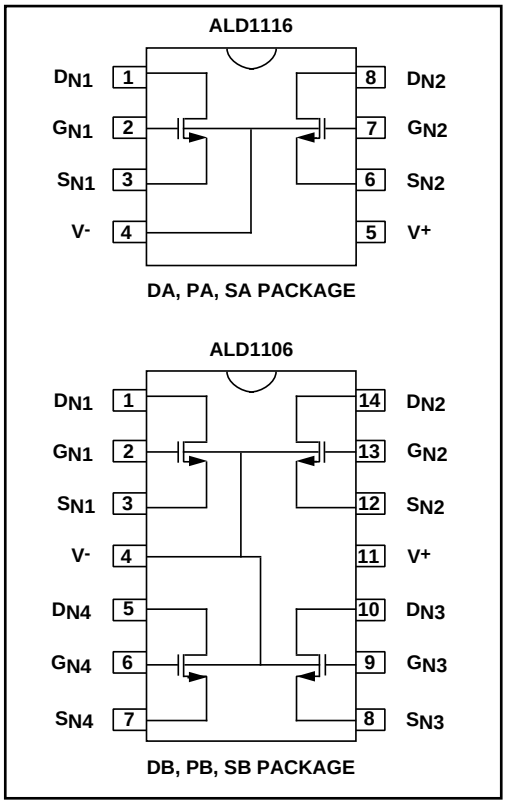
BLOCK DIAGRAM



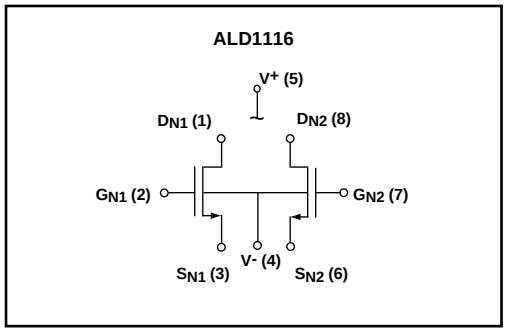
APPLICATIONS

- Precision current mirrors
- Precision current sources
- Voltage choppers
- Differential amplifier input stage
- Voltage comparator
- Data converters
- Sample and Hold
- Analog signal processing

PIN CONFIGURATION



BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Drain-source voltage, V_{DS} — 13.2V
Gate-source voltage, V_{GS} — 13.2V
Power dissipation — 500 mW
Operating temperature range PA, SA, PB, SB package — 0°C to +70°C
DA, DB package — -55°C to +125°C
Storage temperature range — -65°C to +150°C
Lead temperature, 10 seconds — +260°C

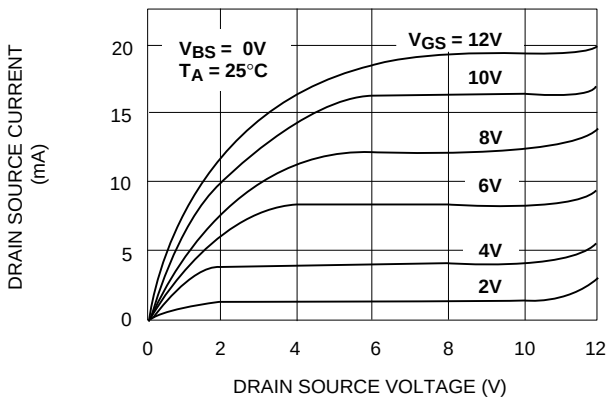
OPERATING ELECTRICAL CHARACTERISTICS
T_A = 25°C unless otherwise specified

		ALD1106			ALD1116				Test
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Unit**	**Conditions**
Gate Threshold Voltage	V_T	0.4	0.7	1.0	0.4	0.7	1.0	V	I_{DS} = 1.0μA V_{GS} = V_{DS}
Offset Voltage V_{GS1}-V_{GS2}	V_{OS}		2	10		2	10	mV	I_{DS} = 10μA V_{GS} = V_{DS}
Gate Threshold Temperature Drift [2]	TC_{VT}		-1.2			-1.2		mV/°C	
On Drain Current	$I_{DS\ (ON)}$	3.0	4.8		3.0	4.8		mA	V_{GS} = V_{DS} = 5V
Transconductance	G_{IS}	1.0	1.8		1.0	1.8		mmho	V_{DS} = 5V I_{DS}= 10mA
Mismatch	ΔG_{fs}		0.5			0.5		%	
Output Conductance	G_{OS}		200			200		μmho	V_{DS} = 5V I_{DS} = 10mA
Drain Source On Resistance	$R_{DS\ (ON)}$		350	500		350	500	Ω	V_{DS} = 0.1V V_{GS} = 5V
Drain Source On Resistence Mismatch	$\Delta_{DS\ (ON)}$		0.5			0.5		%	V_{DS} = 0.1V V_{GS} = 5V
Drain Source Breakdown Voltage	BV_{DSS}	12			12			V	I_{DS} = 1.0μA V_{GS} = 0V
Off Drain Current [1]	$I_{DS\ (OFF)}$		10	400 4		10	400 4	pA nA	V_{DS} =12V V_{GS} = 0V T_A = 125°C
Gate Leakage Current	I_{GSS}		0.1	10 1		0.1	10 1	pA nA	V_{DS} = 0V V_{GS} = 12V T_A = 125°C
Input Capacitance [2]	C_{ISS}		1	3		1	3	pF	

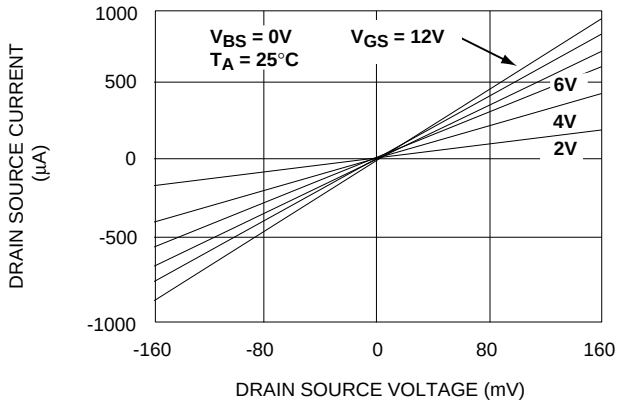
Notes: [1] Consists of junction leakage currents
[2] Sample tested parameters

TYPICAL PERFORMANCE CHARACTERISITCS

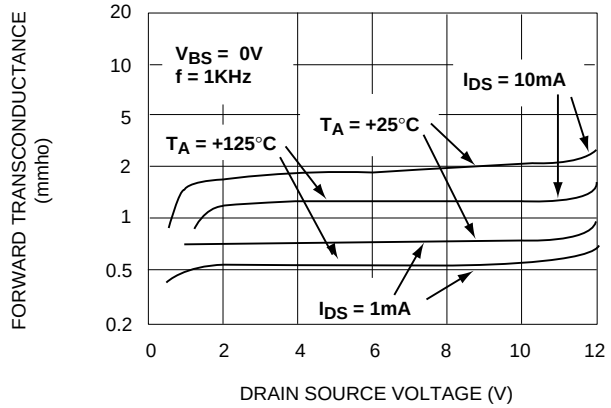
OUTPUT CHARACTERISTICS



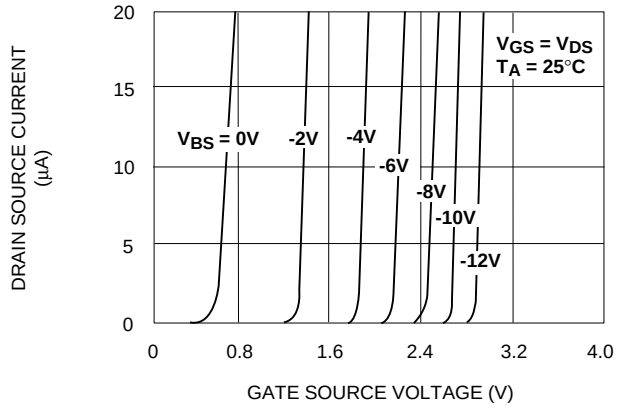
LOW VOLTAGE OUTPUT CHARACTERISTICS



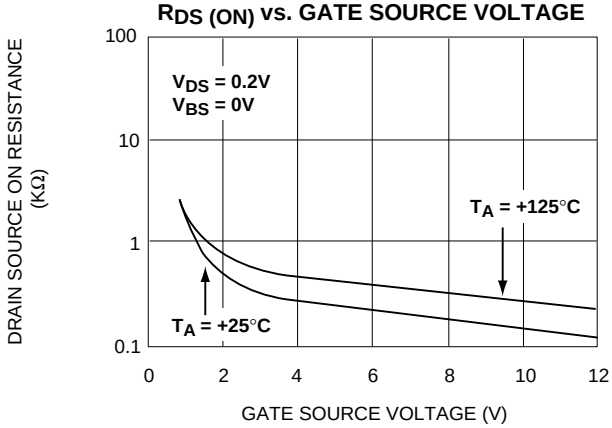
FORWARD TRANSCONDUCTANCE vs. DRAIN SOURCE VOLTAGE



TRANSFER CHARACTERISTIC WITH SUBSTRATE BIAS



DRAIN SOURCE ON RESISTANCE $R_{DS\ (ON)}$ vs. GATE SOURCE VOLTAGE



OFF DRAIN CURRENT vs. AMBIENT TEMPERATURE