2002 Short Form Catalog

ANALOG SOLUTIONS:

- Amplifiers & Buffers
- Power Management MOSFETs
- High Speed Lateral & Vertical DMOS Switches & MOSFETs
- JFETs
- MOSFET Drivers
- Custom Solutions

Calogic LLC, 237 Whitney Place, Fremont, CA 94539 • http://www.calogic.net
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Introduction

Calogic LLC designs and manufactures analog IC's and Discretes for use in power management, computer, video, telecom, instrumentation and medical applications. The product line includes power amplifiers, buffers, references, analog switches, multiplexers, high speed and low leakage discretes.

Package capabilities range from the ultra small outline SOT-23 to the large heatsinked SIP-11 lead packages for the power amplifiers. All wafer fabrication and wafer electrical tests are performed at Calogic's Fremont, California location. Assembly takes place in the Pacific Basin and all final test and QA are accomplished in Fremont.

Buffer & Amplifier Selection Guide

Buffers ±15V Supply

P/N	Description	Bandwidth (-3db(MHz))	Slew Rate (V/μs)	Gain	Output (V/mA)	Vcc, Icc (±V/mA)	Package *
LH0033	Direct replacement to LH0033	100	1500	0.98	12/100	15/18	12G
LH0002	Direct replacement to LH0002	50	200	0.97	10/100	15/6	8H, 10N

* Call for Packaging Options

Amplifiers ±15V Supply

P/N	Description	Bandwidth (-3db(MHz))	Slew Rate (V/μs)	IB (pA)	Vos (mV)	Icc (mA)	Package **
LH0032	Direct replacement to LH0032	70	500	50	2	20	12G

* #N=NO# OF LEADS FOR PDIP PACKAGED

** N=PDIP M=SOIC G=TO8 H=TO5 T=11 LEAD SIP

Power Management Products

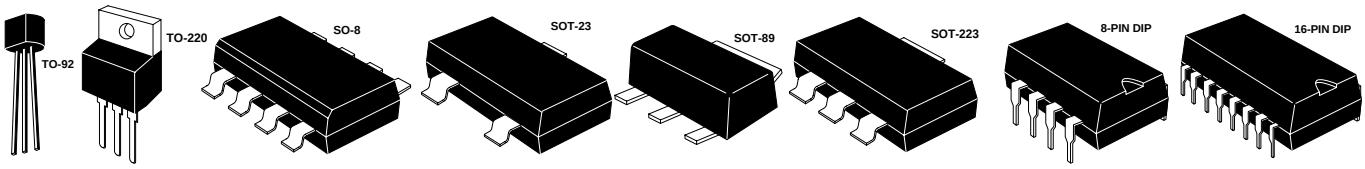
Calogic offers MOSFET Drivers for your Power Management Requirments.
The products are offered in a wide variety of package options, tolerances and power handling capabilities.

Power MOSFET Drivers: This product series can drive a 1.5A to 6.0A MOSFET while attaining relatively high speeds.

P/N	Single	Dual	Output Logic	Max. Operating Voltage (V)	Max. Supply Current I_S (mA)	Peak Current I_{pk} (A)	Switch Speed (ns)	Load Capacitance CL (pF)	Input to Output Delay (D1/D2) (ns)	Package	Description
AS4420	x		N	18	1.5	6	25	2,500	55/55	1,2	High Current Power MOSFET Drivers with Latch-Up Protection.
AS4426		x	I	18	4.5	1.5	19	1,000	15/32	1,2	High Speed Power MOSFET Driver with Latch-Up Protection.
AS4427		x	N	18	4.5	1.5	19	1,000	15/32	1,2	
AS4428		x	B	18	4.5	1.5	19	1,000	15/32	1,2	
AS4429	x		I	18	1.5	6	25	2,500	55/55	1,2	High Current Power MOSFET Drivers with Latch-Up Protection.

Package Style: #1 = 8 Pin SO; #2 = 8 Pin DIP

Notes: I = Inverting Output; N = Non-Inverting Output; B = Both (one I / one N)



Discretes

DMOS FET Switch & Switch Array, N-Channel

DIP (16 Lead) (Enhancement Mode)

P/N	$r_{DS(on)}$ Ω (max)	Switching $t_{d(on)}$ (max(ns))	c_{rss} (pf) (max)	Zener Protected
SD5000N	70	1	0.5	*
SD5001N	70	1	0.5	*
SD5002N	70	1	0.5	*
SD5200N	80	1	0.5	*
SD5300N	45	2.0	0.7	*
SD5501N	150	1	0.3	*

SO-14 (Enhancement Mode) - Surface Mount

P/N	$r_{DS(on)}$ Ω (max)	Switching $t_{d(on)}$ (max(ns))	(pf) (max)	Zener Protected
SD5300CY	45	2.0	0.7	*
SD5400CY	70	1	0.5	*
SD5401CY	70	1	0.5	*
SD5402CY	70	1	0.5	*
SD8901CY	75	1.5	0.3	Double Balanced Mixer

TO-78 (Enhancement Mode)

P/N	$r_{DS(on)}$ (max)	Switching $t_{d(on)}$ (max(ns))	c_{rss} (pf) (max)	Matching	Applications
SD411	70	1.0	0.3	25mV	Differential Amplifier
SD8901HD	75	1.5	0.3		Double Balanced Mixer

TO-92 (Enhancement Mode)

P/N	$r_{DS(on)}$ (max)	Switching $t_{d(on)}$ (max(ns))	c_{rss} (pf) (max)	Zener Protected
SD403BD	60	1.2	0.6	*

SOT-143 (Enhancement Mode) - Surface Mount

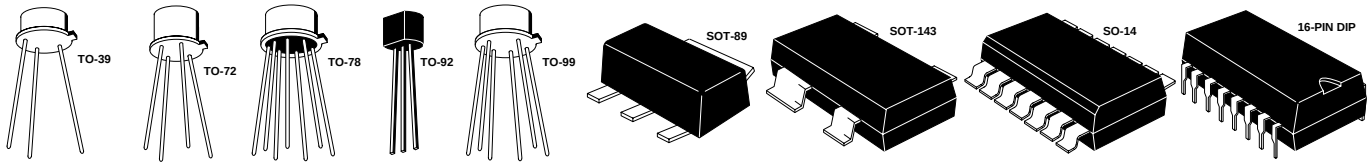
P/N	$r_{DS(on)}$ Ω (max)	Switching $t_{d(on)}$ (max(ns))	c_{rss} pf (max)	Zener Protected
SD201CY	70	1	0.5	*
SD203CY	70	1	0.5	*
SST211	70	1	0.5	*
SST213	70	1	0.5	*
SST215	70	1	0.5	*
SSTSD201	70	1	0.3	*
SSTSD203	70	1	0.3	*
SD403CY	60	1.2	0.6	*

TO-72 (Enhancement Mode)

P/N	$r_{DS(on)}$ Ω (max)	Switching $t_{d(on)}$ (max(ns))	c_{rss} (pf) (max)	Protection Zener/Non-Zener	
SD200DC	70	1	0.3		*
SD201DC	70	1	0.3	*	
SD202DC	50	1	0.3		*
SD203DC	50	1	0.3	*	
SD210DE	70	1	0.5		*
SD211DE	70	1	0.5	*	
SD212DE	70	1	0.5		*
SD213DE	70	1	0.5	*	
SD214DE	70	1	0.5		*
SD215DE	70	1	0.5	*	
SD217DE	7.5			*	
SD219DE	5			*	

Vertical DMOS Switches (Enhancement Mode)

P/N	B_V (V(min))	$r_{DS(on)}$ Ω (max)	$I_{D(on)}$ (mA(min))	Package	Channel
2N7000	60	5	75	TO-92	N
2N7002	60	7.5	500	SOT-23	N



WARNING: Life Support Application Policy

Calogic LLC products are not authorized for and should not be used within Life Support Systems without the specific written consent of Calogic LLC. Life Support Systems are equipment intended to support or sustain life and whose failure to perform when properly used in accordance with instructions provided can be reasonably expected to result in significant personal injury or death. Users contemplating application of Calogic LLC products in Life Support Systems are requested to contact Calogic LLC factory headquarters for suitable terms, additional processing. User agrees to hold Calogic LLC harmless from any claims arising out of the use of Calogic LLC parts in Life Support Systems and or equipment.

Discretes *(continued)*

JFET Switches

P/N	I_{DSS} (mA(min))	$V_{GS(off)}$ V(max))	I_{GSS} (pA(max))	$r_{DS(on)}$ (Ω(max))	c_{rss} (pF(max))	Package	Channel
2N5114	-30	10	500	75	7	TO-18	P
2N5115	-15	6	500	100	7	TO-18	P
2N5116	-5	4	500	150	7	TO-18	P
2N5434	30	-4	-200	10	15	TO-52	N
J108	80	-10	-3000	8	15	TO-92	N
J109	40	-6	-3000	12	15	TO-92	N
J110	10	-4	-3000	18	15	TO-92	N
J111	20	-10	-1000	30	5	TO-92	N
J112	5	-5	-1000	50	5	TO-92	N
J113	2	-3	-1000	100	5	TO-92	N
J174	-20	10	1000	85	5.5	TO-92	P
J175	-7	6	1000	125	5.5	TO-92	P
J176	-2	4	1000	250	5.5	TO-92	P
J177	-1.5	2.25	1000	300	5.5	TO-92	P
PN4391	50	-10	-1000	30	5	TO-92	N
PN4392	25	-5	-1000	60	5	TO-92	N
PN4393	5	-3	-1000	100	5	TO-92	N
SST111	20	-10	-1000	30	5	SOT-23	N
SST112	5	-5	-1000	50	5	SOT-23	N
SST113	2	-3	-1000	100	5	SOT-23	N
SST108	80	-10	-3000	8	15	SOT-23	N
SST109	40	-6	-3000	12	15	SOT-23	N
SST110	10	-4	-3000	18	15	SOT-23	N
SST174	-20	10	1000	85	5	SOT-23	P
SST175	-7	6	1000	125	5	SOT-23	P
SST176	-2	4	1000	250	5	SOT-23	P
SST177	-1.5	2.25	1000	300	5	SOT-23	P
SST4391	50	-10	-1000	30	5	SOT-23	N
SST4392	25	-5	-1000	60	5	SOT-23	N
SST4393	5	-3	-1000	100	5	SOT-23	N

JFET Amplifier Applications

Dual Amplifiers, N-Channel

P/N	I_{DSS} (mA(min))	I_{GSS} (pA(max))	g_{fs} (mS(min))	$\bar{e}_N$ (nV/√Hz) (typ)	Match (V_{GS1-2m}V) (max)	Package
2N5911	7	-100	5.0	15	10	TO-78
2N5912	7	-100	5.0	15	15	TO-78
SST5911	7	-100	5.0	10	10	SO-8
SST5912	7	-100	5.0	10	15	SO-8
SST440	6	-500	4.5	10	10	SO-8
SST441	6	-500	4.5	10	20	SO-8
SST404	0.5	-25	2.0	10	15	SO-8
SST405	0.5	-25	2.0	10	20	SO-8
SST406	0.5	-25	2.0	10	40	SO-8
U401	0.5	-25	2.0	10	5	TO-71
U402	0.5	-25	2.0	10	10	TO-71
U403	0.5	-25	2.0	10	10	TO-71
U404	0.5	-25	2.0	10	15	TO-71
U405	0.5	-25	2.0	10	20	TO-71
U406	0.5	-25	2.0	10	40	TO-71
U421	0.06	-1.0	0.3	50	10	TO-78
U422	0.06	-1.0	0.3	50	15	TO-78
U423	0.06	-1.0	0.3	50	25	TO-78
U424	0.06	-3.0	0.3	50	10	TO-78
U425	0.06	-3.0	0.3	50	15	TO-78
U426	0.06	-3.0	0.3	50	25	TO-78
U440	6.0	-500	4.5	10	10	TO-71
U441	6.0	-500	4.5	10	20	TO-71
U443	6.0	-500	4.5	10	10	TO-78
U444	6.0	-500	4.5	10	20	TO-78

JFET Amplifier Applications

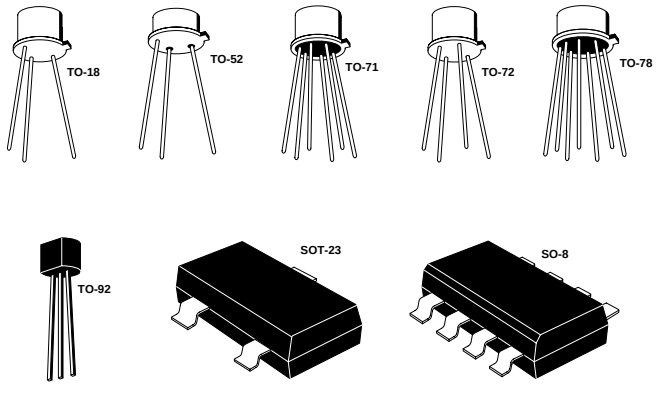
Low Noise

P/N	I_{DSS} (mA(min))	I_{GSS} (pA(max))	g_{fs} (mS(min))	$\bar{e}_N$ (nV/√Hz (typ))	Package	Channel
2N4220	0.5	-100	1.0	20	TO-72	N
2N4338	0.2	-100	0.2	5	TO-18	N
2N4339	0.5	-100	0.8	5	TO-18	N
2N4340	1.2	-100	1.3	5	TO-18	N
2N4341	3.0	-100	2.0	5	TO-18	N
J201	0.2	-100	0.5	5	TO-92	N
J202	0.9	-100	1.0	5	TO-92	N
J203	4.0	-100	1.5	10	TO-92	N
J204	0.2	-100	0.5	10	TO-92	N
SST201	0.2	-100	0.5	5	SOT-23	N
SST202	0.9	-100	1.0	5	SOT-23	N
SST203	4.0	-100	1.5	5	SOT-23	N
SST204	0.2	-100	0.5	10	SOT-23	N

JFET Amplifier Applications

Low Leakage

P/N	I_{DSS} (mA(min))	I_{GSS} (pA(max))	gf_s (mS(min))	$\bar{e}_N$ (nV/√Hz (typ))	Package	Channel
PN4117A	0.02	-1	0.07	25	TO-92	N
PN4118A	0.08	-1	0.08	25	TO-92	N
PN4119A	0.2	-1	0.1	25	TO-92	N
SST4117	0.02	-1	0.07	25	SOT-23	N
SST4118	0.08	-1	0.08	25	SOT-23	N
SST4119	0.02	-1	0.1	25	SOT-23	N



Discretes *(continued)*

JFET Amplifier Applications

High Gain

P/N	I_{DSS} (mA(min))	I_{GSS} (pA(max))	g_{fs} (mS(min))	$\bar{e}_N$ (nV/$\sqrt{Hz}$ (typ))	Package	Channel
2N4416/A	5.0	-100	4.5	10	TO-72	N
2N5484	1.0	-1000	3.0	20	TO-92	N
2N5485	4.0	-1000	3.5	20	TO-92	N
2N5486	8.0	-1000	4.0	20	TO-92	N
J210	2.0	-100	4.0	5	TO-92	N
J211	7.0	-100	6.0	5	TO-92	N
J212	15.0	-100	7.0	5	TO-92	N
J270	-2.0	200	6.0	20	TO-92	P
J271	-6.0	200	8.0	20	TO-92	P
J308	12.0	-1000	8.0	5	TO-92	N
J309	12.0	-1000	10.0	5	TO-92	N
J310	24.0	-1000	8.0	5	TO-92	N
PN4416	5.0	-100	4.5	10	TO-92	N
SSTJ210	2.0	-100	4.0	5	SOT-23	N
SSTJ211	7.0	-100	6.0	5	SOT-23	N
SSTJ212	15	-100	7.0	5	SOT-23	N
SST270	2.0	200	6.0	20	SOT-23	P
SST271	6.0	200	8.0	20	SOT-23	P
SST308	12.0	-1000	8.0	5	SOT-23	N
SST309	12.0	-1000	10.0	5	SOT-23	N
SST310	24.0	-1000	8.0	5	SOT-23	N
SST4416	5.0	-100	4.5	10	SOT-23	N
U308	12.0	-150	10	5	TO-52	N
U309	12.0	-150	10	5	TO-52	N
U310	24.0	-150	10	5	TO-52	N

JFET Amplifier Applications

General Purpose

P/N	I_{DSS} (mA(min))	I_{GSS} (pA(max))	g_{fs} (mS(min))	$\bar{e}_N$ (nV/$\sqrt{Hz}$ (typ))	Package	Channel
2N5457	1.0	-1000	1.0	10	TO-92	N
2N5458	2.0	-1000	1.5	10	TO-92	N
2N5459	4.0	-1000	2.0	10	TO-92	N

Note: All TO-92 product is available in SOT-23, order as SSTXXXX;
i.e. J310 (TO-92) = SST310 (SOT-23)

Current Regulators

P/N (Industry)	I_F(mA) (min)	I_F(mA) (max)	V_L(V) (min)	Package
J500	0.192	0.288	50	TO-92
J501	0.264	0.396	50	TO-92
J502	0.344	0.516	50	TO-92
J503	0.448	0.672	50	TO-92
J504	0.600	0.900	50	TO-92
J505	0.800	1.200	50	TO-92
J506	1.120	1.680	50	TO-92
J507	1.440	2.160	50	TO-92
J508	1.900	2.900	50	TO-92
J509	2.400	3.600	50	TO-92
J510	2.900	4.300	50	TO-92
J511	3.800	5.600	50	TO-92
SST500	0.192	0.288	50	SOT-23
SST501	0.264	0.396	50	SOT-23
SST502	0.344	0.516	50	SOT-23
SST503	0.448	0.672	50	SOT-23
SST504	0.600	0.900	50	SOT-23
SST505	0.800	1.200	50	SOT-23
SST506	1.120	1.680	50	SOT-23
SST507	1.440	2.160	50	SOT-23
SST508	1.900	2.900	50	SOT-23
SST509	2.400	3.600	50	SOT-23
SST510	2.900	4.300	50	SOT-23
SST511	3.800	5.600	50	SOT-23

Low Leakage Diodes

P/N	I_G (IR) (pA(max))	B_V (V(min))	Capacitance (C_r pf (max))	Package	Dual	Single
DPAD1	-1	-45	0.8	TO-78	*	
DPAD2	-2	-45	0.8	TO-71	*	
DPAD5	-5	-45	0.8	TO-71	*	
DPAD10	-10	-35	2.0	TO-71	*	
DPAD20	-20	-35	2.0	TO-71	*	
DPAD50	-50	-35	2.0	TO-71	*	
DPAD100	-100	-35	2.0	TO-71	*	
JPAD5	-5	-35	2.0	TO-92		*
JPAD10	-10	-35	2.0	TO-92		*
JPAD20	-20	-35	2.0	TO-92		*
JPAD50	-50	-35	2.0	TO-92		*
JPAD100	-100	-35	2.0	TO-92		*
JPAD200	-200	-3.5	2.0	TO-92		*
PAD1	-1	-45	0.8	TO-18		*
PAD2	-2	-45	0.8	TO-18		*
PAD5	-5	-45	0.8	TO-18		*
PAD10	-10	-35	2.0	TO-18		*
PAD20	-20	-35	2.0	TO-18		*
PAD50	-50	-35	2.0	TO-18		*
SSTPAD5	-5	-35	2.0	SOT-23		*
SSTPAD10	-10	-35	2.0	SOT-23		*
SSTPAD20	-20	-35	2.0	SOT-23		*
SSTPAD50	-50	-35	2.0	SOT-23		*
SSTPAD100	-100	-35	2.0	SOT-23		*
SSTDPAD5	-5	-45	2.0	S0-8	*	
SSTDPAD10	-10	-35	2.0	S0-8	*	

MOSFET's

P/N	I_{GSS} (pA(max))	$V_{GS(th)}$ (V(max))	$r_{DS(on)}$ (Ω(max))	c_{rss} (pf(max))	Dual	Single
3N163	-10	-5	250	0.7		*
3N164	-10	-5	300	0.7		*
3N165	-10	-5	300	0.7	*	
3N166	-10	-5	300	0.7	*	
3N170	±10	2	200	1.3		*
3N171	±10	3	200	1.3		*
3N172	-200	-5	250	1.0		*
3N173	-500	-5	350	1.0		*
3N190	-10	-5	300	1.0	*	
3N191	-10	-5	300	1.0	*	
2N4351	-10	5	300	1.3		*
2N4352	-10	5	300	1.3		*
IT1700	-10	-5	400	1.2		*
IT1750	10	3	50	1.6		*
M116	100	5	200	-		*

Dual = TO-99, Single = TO-72
Also available in surface mount upon request.

Full Custom Analog ASIC Capabilities

Calogic designs and manufactures Bipolar Junction Isolated (JI) and Dielectrically Isolated (DI) products. SPICE models, layout, DRC and ERC are available. These processes are executed in Calogic's state of the art wafer fabrication facility located in Fremont, California.

FEATURES OF CALOGIC'S CUSTOM CAPABILITIES INCLUDE:

JI LINEAR BIPOLAR PROCESS

FEATURES

- 26V Process
- Programmable components can be configured as either NPN or PNP transistors, using only a single layer of metal.
- Layouts can be based on the total number of transistors required, without regard to polarity.
- There are upwards of 30-50% more components per unit area than on so-called "master" chips.
- Mixed analog/digital designs are achievable.
- Completed layouts can be captured and reused - at other locations on the same chip, or on other chips in the family.

DI COMPLEMENTARY BIPOLAR PROCESS

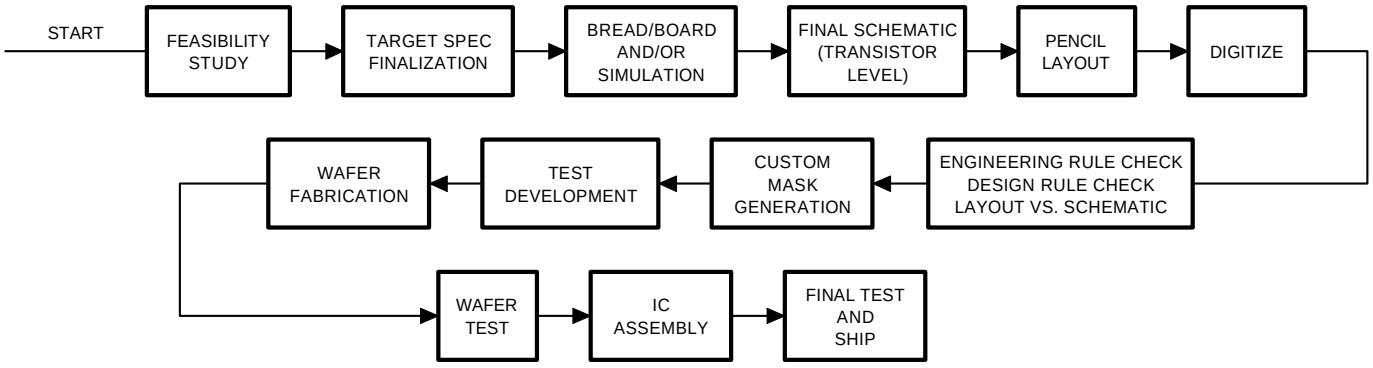
FEATURES

- Cell-Based Structure
- 90V Process
- Complementary Bipolar NPN and PNP Transistors
- Dielectrically-Isolated Active and Passive Components
- Poly-Silicon Resistors - for Accuracy and Matching
- Optional Silicon-Chromium Thin-Film Resistors - for Added Precision
- Optional On-Chip MOS Capacitors

CALOGIC OFFERS:

- Mixed Analog/Digital Design Capability
- Customer Design or Calogic Design or a Joint Project
- Development Between Customer's and Calogic's Engineering
- Quick Turn-Around
- Silicon-Efficiency
- Software Tools Support the Design Effort
- Kit Parts Available
- SPICE Models Available

TYPICAL PROJECT FLOW



Q: WHAT KIND OF CIRCUITS CAN BE IMPLEMENTED ON CUSTOM AND SEMI-CUSTOM BIPOLAR ARRAYS?

A:

- Current Sources
- Amplifiers
- Operational Amplifiers
- Comparators
- Voltage Regulators
- Voltage-to-Current Converters
- Translinear Circuits
- Gain Control/Variable Impedance
- Flip Flops, Gates, and Schmitt Triggers
- Oscillators and Timers
- Phase Detectors and Phase-Locked Loops
- Sample and Hold, Clamp, and Signal Switching Circuits
- Rectifiers, Detectors, and D.C. Restorers
- Output Stages
- Low Voltage Circuits
- Miscellaneous Circuits

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