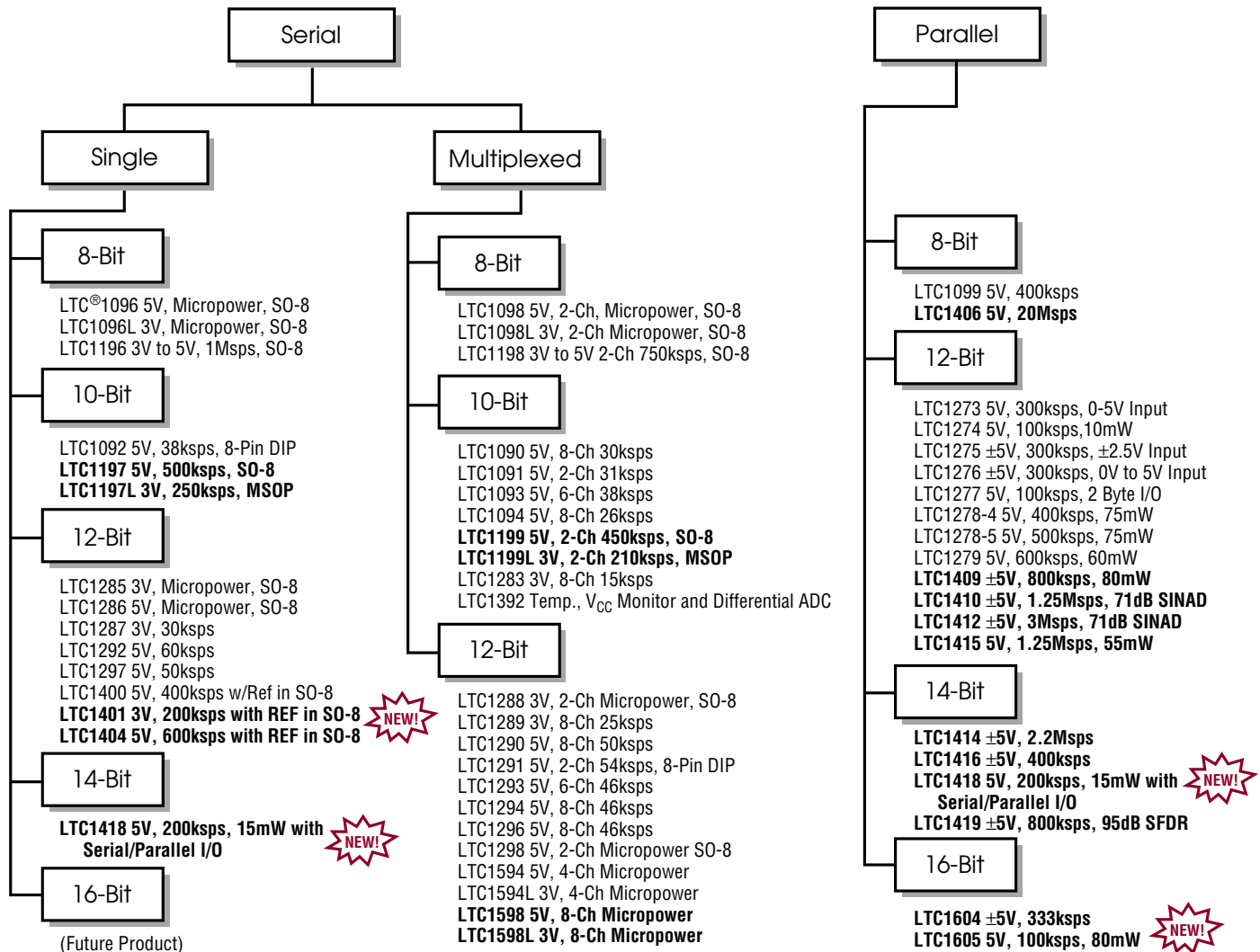


### Analog-to-Digital Converters



IC08 p.01

# Single Input ADC Feature Comparison

	RESOLUTION (BITS)	SAMPLE RATE (KSPS)	TYPICAL POWER DISSIPATION (mW)	MICROPOWER	3V SINGLE SUPPLY	5V SINGLE SUPPLY	±5V SUPPLY	BIPOLAR INPUT CAPABILITY	SERIAL I/O	PARALLEL I/O	ONBOARD REFERENCE	INPUT SPAN (V)	SHUTDOWN	PACKAGES	NUMBER OF PINS	SINAD AT NYQUIST (dB)	DATABOOK PAGE
LTC1604	16	333	250**									±2.5		G	36	90	New
LTC1605	16	100	55									±10		N, G, SW	28	87.5	97DB 6-171
LTC1414	14	2200	150									±2.5		GN	28	81.5	New
LTC1419	14	800	150**									±2.5		G, SW	28	81.5	97DB 6-106
LTC1416	14	400	75**									±2.5		G	28	81.5	New
LTC1418	14	200	18**									±2.5/0-5		N, G	28	82	New
LTC1412	12	3000	150									±2.5		G	28	72.5	New
LTC1415	12	1250	55**											G, SW	28	70	97DB 6-85
LTC1410	12	1250	150**									±2.5		G, SW	28	71	96DB 6-58
LTC1409	12	800	75**									±2.5		G, SW	28	71	97DB 6-65
LTC1404	12	600	60**									±2/0-4		S8	8	72	New
LTC1279	12	600	75**									5/±2.5		SW	24	70	95DB 6-8
LTC1278-5	12	500	75**									5/±2.5		SW	24	70	94DB 6-80
LTC1278-4	12	400	75**									5/±2.5		N, SW	24	70	94DB 6-80
LTC1400	12	400	75**									4.1		S8	8	70	97DB 6-46
LTC1273	12	300	75									5		N, SW	24	70	94DB 6-58
LTC1275	12	300	75									±2.5		N, SW	24	70	94DB 6-58
LTC1276	12	300	75									±5		N, SW	24	70	94DB 6-58
LTC1272-3	12	250	75									5		N, SW	24	65	92DB 6-6
LTC1401	12	200	12**									0-2.048		S8	8		New
LTC1282	12	140	12									2.5/±1.25		N, SW	24	68	94DB 6-95
LTC1272-8	12	110	75									5		N, SW	24		92DB 6-6
LTC1274	12	100	10**									4		SW	24	73	95DB 13-22
LTC1277	12	100	10**									4		SW	24	73	95DB 13-22
LTC1292	12	60	30									5		N8	8		94DB 6-182
LTC1297	12	50	30*									5		N8	8		94DB 6-182
LTC1287	12	30	4.5									3.3/±3.3		N8	8		92DB 6-25
LTC1286	12	12.5	1.25*									5		N8, S8	8		94DB 6-140
LTC1285	12	7.5	0.48*									3		N8, S8	8		95DB 6-24
LTC1197	10	500	25*									0-V <sub>REF</sub>		S8	8	60	97DB 6-8
LTC1197L	10	250	0.5*									0-V <sub>REF</sub>		S8, MS8	8	58	97DB 6-8
LTC1092	10	38	5									0-V <sub>REF</sub>		N8	8		90DB 9-29
LTC1406	8	20,000	150**									2/±1		GN	24	48	New
LTC1196	8	1000	4.5									1-V <sub>REF</sub>		S8	8		94DB 6-32
LTC1099	8	400	55									0-V <sub>REF</sub>		N, SW	20		90DB 9-81
LTC1096	8	33	0.6*									0-V <sub>REF</sub>		N8, S8	8		94DB 6-8
LTC1096L	8	17	0.36*									0-V <sub>REF</sub>		N8, S8	8		96DB 6-8

\*Auto shutdown automatically reduces power dissipation at lower sample rates

\*\*Power shutdown can reduce power dissipation at lower sample rates

## Multiplexed ADC Feature Comparison































	RESOLUTION (BITS)	NUMBER OF CHANNELS	SAMPLE RATE (ksps)	TYPICAL POWER DISSIPATION (mW)	MICROPOWER	3V SINGLE SUPPLY	5V SINGLE SUPPLY	±5V SUPPLY	DIFFERENTIAL INPUT	BIPOLAR INPUT CAPABILITY	HALF-DUPLEX SERIAL I/O	FULL-DUPLEX SERIAL I/O	MINIMUM INPUT SPAN (V)	SHUTDOWN	PACKAGES	NUMBER OF PINS	DATABOOK PAGE
LTC1290	12	8	50	30**									1.2		N, SW	20	92DB 6-67
LTC1294	12	8	46	30**									1.2		N, SW	20	92DB 6-113
LTC1296	12	8	46	30**									1.2		N, SW	20	92DB 6-113
LTC1289	12	8	25	4.5**									1.2		N, SW	20	92DB 6-40
LTC1598	12	8	16.8	1.6*									1.2		G	24	97DB 6-125
LTC1598L	12	8	10.5	0.48*									1.2		G	24	97DB 6-148
LTC1293	12	6	46	30**									1.2		N, SW	16	92DB 6-113
LTC1594	12	4	16.8	1.6*									1.2		SO	16	97DB 6-125
LTC1594L	12	4	10.5	0.48*									1.2		SO	16	97DB 6-148
LTC1291	12	2	54	30**									NA		N8	8	94DB 6-163
LTC1298	12	2	11.1	1.7*									1.2		N8, S8	8	94DB 6-140
LTC1288	12	2	6.6	0.63*									2.7		N8, S8	8	95DB 6-24
LTC1090	10	8	30	5									0.2		N, SW	20	90DB 9-5
LTC1094	10	8	26	5									0.2		N	20	90DB 9-29
LTC1283	10	8	15	0.45									0.2		N	20	94DB 6-117
LTC1093	10	6	26	5									0.2		N, SW	16	90DB 9-29
LTC1199	10	2	450	25*									0.2		S8	8	97DB 6-8
LTC1199L	10	2	210	2.5*									0.2		S8, MS8	8	97DB 6-8
LTC1091	10	2	31	7.5									4.5		N8	8	90DB9-29
LTC1392	10	#	25	3.5									NA		N8, S8	8	97DB 6-35
LTC1198	8	2	750	35/4.5*									2.7		S8	8	94DB 6-32
LTC1098	8	2	33	0.78*									4.5		N8, S8	8	94DB 6-8
LTC1098L	8	2	16.5	0.47*									2.7		N8, S8	8	96DB 6-8

\* Auto shutdown automatically reduces power dissipation at lower sample rates

\*\* Power shutdown can reduce power dissipation at lower sample rates

# Onboard temperature sensor, onboard supply monitor and differential ADC input

### $V_{OUT}$ DACs with Output Amplifier

	RESOLUTION	I/O	INT REF	$V_{OUT}$	DAISY CHAIN	$V_{CC}$	$P_{DIS}$ (mW)	SETTLING TIME ( $\mu$ s)	PINS	PACKAGES	POWER-ON RESET
<b>Single</b>											
LTC1650	16	Serial SPI	Ext	-4V to 4.5V		$\pm 4.75V$ to $\pm 5.25V$	50	4	16	SO	
LTC1257	12	Serial SPI	2.048V*	0V to 2.048V		4.5V to 15V	1.75	6	8	SO/PDIP	
LTC1451	12	Serial SPI	2.048V*	0V to 4.096V		4.5V to 6.5V	2.0	14	8	SO/PDIP	
LTC1452	12	Serial SPI	Ext	0V to 2( $V_{REF}$ )		2.7V to 6.5V	0.68	14	8	SO/PDIP	
LTC1453	12	Serial SPI	1.22V*	0V to 2.5V		2.7V to 3.5V	0.75	14	8	SO/PDIP	
LTC1456	12	Serial SPI	2.048V*	0V to 4.096V		4.5V to 6.5V	2.2	14	8	SO/PDIP	
LTC1450	12	Parallel	2.048V*	0V to 4.096V/Ext. $V_{REF}$		4.5V to 5.5V	2.0	14	24	SSOP/PDIP	
LTC1450L	12	Parallel	1.22V*	0V to 2.5V/Ext. $V_{REF}$		2.7V to 3.5V	0.75	14	24	SSOP/PDIP	
LTC1659	12	Serial SPI	Ext	0V to $V_{REF}$		2.7V to 5.5V	0.72	14	8	MSOP/SO	
<b>Dual</b>											
LTC1446	12	Serial SPI	2.048V	0V to 4.096V		4.5V to 6.5V	5.0	14	8	SO/PDIP	
LTC1446L	12	Serial SPI	1.22V	0V to 2.5V		2.7V to 3.5V	1.95	14	8	SO/PDIP	
LTC1448	12	Serial SPI	Ext	0V to $V_{REF}$		2.7V to 5.5V	1.35	14	8	SO/PDIP	
LTC1454	12	Serial SPI	2.048V*	0V to 4.096V/Ext. $V_{REF}$		4.5V to 5.5V	3.5	14	16	SO/PDIP	
LTC1454L	12	Serial SPI	1.22V*	0V to 2.5V/Ext. $V_{REF}$		2.7V to 3.5V	1.35	14	16	SO/PDIP	
<b>Quad</b>											
LTC1458	12	Serial SPI	2.048V*	0V to 4.096V/Ext. $V_{REF}$		4.5V to 5.5V	5.5	14	28	SSOP/SO	
LTC1458L	12	Serial SPI	1.22V*	0V to 2.5V/Ext. $V_{REF}$		2.7V to 3.5V	2.4	14	28	SSOP/SO	
<b>Octal</b>											
LTC1660	10	Serial SPI	Ext	0V to $V_{REF}$		2.7V to 5.5V	1.0	30	16	SSOP/PDIP	

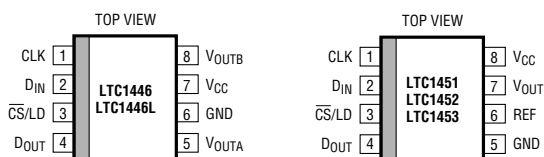
\*Internal Ref may be overdriven

### Current Output DACs

	RESOLUTION (BITS)	INPUT	OUTPUT	OUTPUT COMPLIANCE (V)	$V_{CC}$	COMMENTS
<b>Single</b>						
LTC1427-50	10	SMBus/I <sup>2</sup> C	50 $\mu$ A Sourcing	-15V to ( $V_{CC}$ -1.3V)	2.7V to 5.5V	Ideal for driving the feedback node on adjustable voltage regulators for power supplies or LCD bias controllers
LTC1428-50	8	Triple Mode: 3-wire Serial SPI, increment only or increment/decrement pulse modes	50 $\mu$ A Sinking	2V to 10V	3V to 6.5V	
LTC1329-10	8		10 $\mu$ A Sourcing	-15V to 2.5V	2.7V to 6.5V	
LTC1329-50	8		50 $\mu$ A Sourcing	-15V to 2.5V	2.7V to 6.5V	

### PWM Output DACs

	RESOLUTION (BITS)	INPUT	OUTPUT	$V_{CC}$	COMMENTS
<b>Dual</b>					
LTC1426	6	Pulse Mode: increment only or increment/decrement	PWM Voltage	2.7V to 5.5V	Dual PWM Outputs available in MSOP

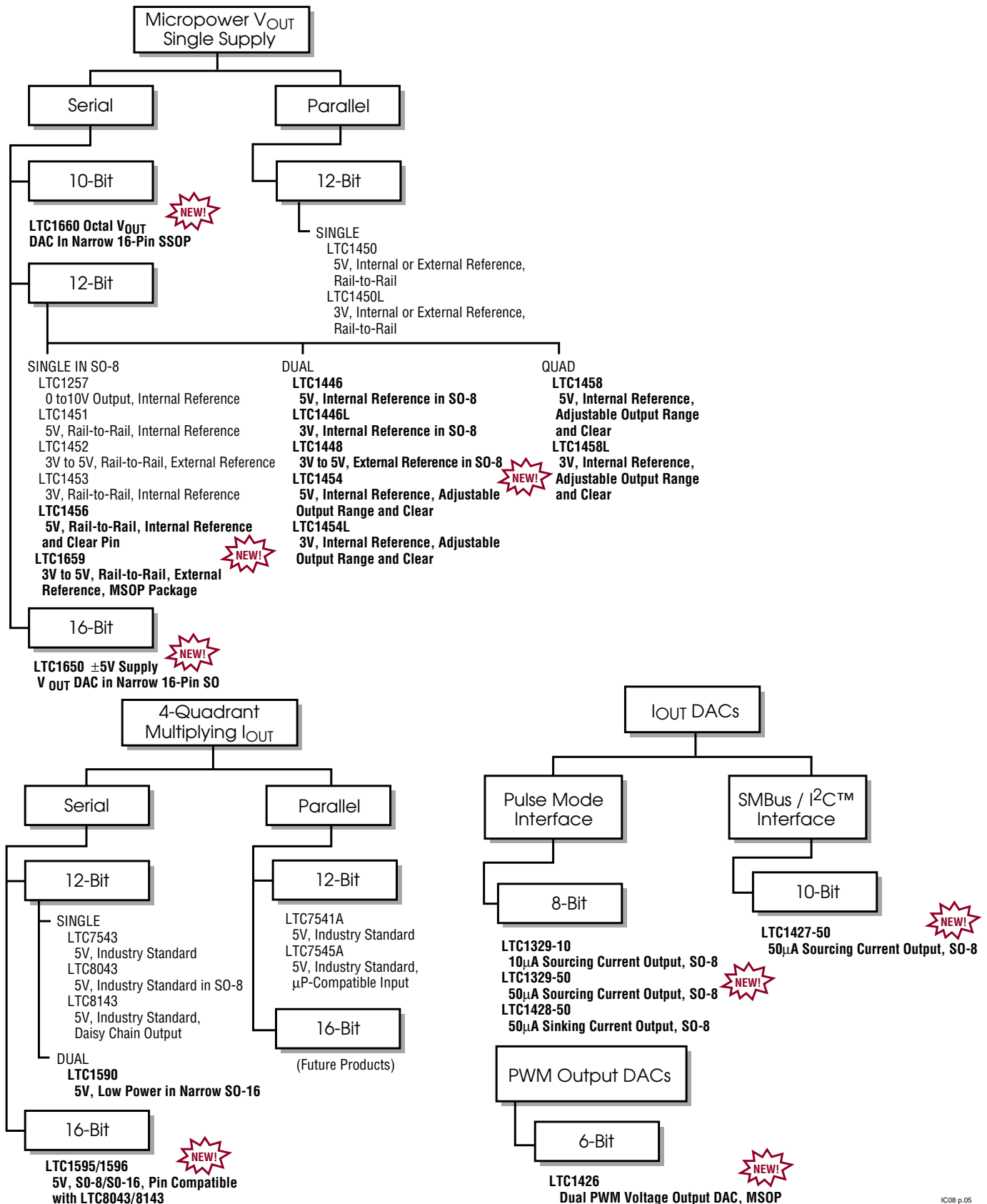


**Complete 12-Bit Single and Dual  
DACs in SO-8 Packages !!**

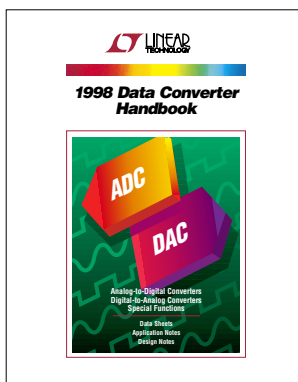
### Multiplying Current Output

	RESOLUTION (BITS)	I/O	$V_{CC}$	COMMENTS
<b>Single</b>				
LTC1595	16	Serial	5V	LTC8043 16-Bit Upgrade
LTC1596	16	Serial	5V	LTC8143 16-Bit Upgrade
LTC7541A	12	Parallel	5V	
LTC7543	12	Serial	5V	
LTC7545	12	Parallel	5V	Microprocessor Compatible
LTC8043	12	Serial	5V	SO-8
LTC8143	12	Serial	5V	Daisy-Chain Serial Data Output
<b>Dual</b>				
LTC1590	12	Serial	5V	SO-16

### Digital-to-Analog Converters



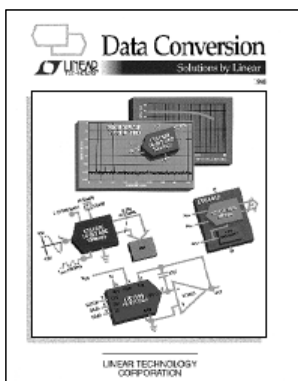
## Additional Data Conversion Literature



### 1998 Data Converter Handbook

#### **Data Converter Handbook —**

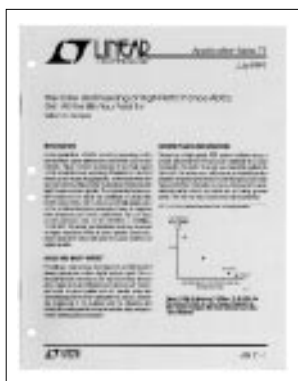
This impressive 1360-page handbook includes all of the data sheets, application notes and design notes for Linear Technology's family of high performance data converter products. Products include A/D converters (ADCs), D/A converters (DACs) and multiplexers—including the fastest monolithic 16-bit ADC, the 3Msps, 12-bit ADC with the best dynamic performance and the first dual 12-bit DAC in an SO-8 package. Also included are selection guides for references, op amps and filters and a glossary of data converter terms.



### 1998 Data Conversion Solutions

#### **Data Conversion Solutions Brochure —**

This 64 page collection of data conversion circuits, products and selection guides serves as excellent reference material for the data acquisition system designer. Over 60 products are showcased solving problems in low power, small size and high performance data conversion applications with actual performance graphs and specifications. Topics covered include ADCs, DACs, voltage references and filters. A complete glossary defines data conversion specifications and there is a selected listing of application and design notes available.



### Application Note 71

#### **The Care and Feeding of High Performance ADCs: Get All the Bits You Paid For —**

A new generation of ADCs currently appearing on the scene brings higher performance and lower cost to new markets. At the same time, the new converters achieve better dynamic performance with high frequency input signals. This means that more system designers are facing the challenge of using high performance ADCs. In this article, we will talk about some of the problems designers encounter, how to recognize their symptoms and how to avoid them. We will focus on the particular case of the LTC1410, a 1.25Msps, 12-bit ADC. The same considerations become important in higher resolution ADCs at lower speeds. Conversely, lower resolution ADCs will need this same attention at higher speeds.