

TYPE NUMBER	MFR	APP	CMP	GBP MIN	SLEW RATE MIN	V <sub>S+</sub> MAX	V <sub>S-</sub> MAX	T <sub>OD</sub> MAX	A <sub>VOL</sub> MIN	V <sub>IO</sub> MAX	I <sub>B</sub> MAX	I <sub>IO</sub> MAX	P <sub>TOT</sub> MAX	I <sub>OUT</sub> MIN	V <sub>OUT</sub> MIN	V <sub>ICM</sub> MAX	V <sub>IDF</sub> MAX	rV <sub>IO</sub> /dT MAX	P <sub>O</sub> MAX	I <sub>O</sub> MAX	CM RR MIN	PS RR MIN	R <sub>IN</sub> MIN
LM301AJ	NAU	GPU	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	3MA	70dB	70dB	500K
LM301AJ	TDG	GPU	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	3MA	70dB	70dB	500K
LM301AJ14	NAU	GPU	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	3MA	70dB	70dB	500K
LM301AN	ING	GPU	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	3MA	70dB	70dB	500K
LM301AN(8)	MUG	GPU	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	500K
LM301AN-8	TDG	GPU	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	3MA	70dB	70dB	500K
LM301AT	SJU	GPU	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	500K
LM301AV	SJU	GPU	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	500K
LM301D	ADU	GPU	EXT	.	.	+18V	-18V	70C	83dB	10MV	2uA	.75uA	500MWF	5MA	12V	15V	30V	30uV/C	.	3MA	65dB	70dB	100K
LM301F	ADU	GPU	EXT	.	.	+18V	-18V	70C	83dB	10MV	2uA	.75uA	500MWF	.	12V	15V	30V	30uV/C	.	3MA	65dB	70dB	100K
LM301H	ADU	GPU	EXT	.	.	+18V	-18V	70C	83dB	10MV	2uA	.75uA	500MWF	.	12V	15V	30V	30uV/C	.	3MA	65dB	70dB	100K
LM302D	ADU	VFA	INT	.	.	+18V	-18V	85C	0dB	15MV	30NA	.	500MWF	1MA	10V	.	.	90uV/C	.	6MA	.	60dB	10G
LM302H	NAU	VFA	INT	.	.	+18V	-18V	70C	0dB	15MV	30NA	.	500MWF	1MA	10V	.	.	90uV/C	.	6MA	.	60dB	10G
LM306H	NAU	CPR	EXT	.	.	+15V	-15V	70C	84dB	5MV	25uA	5uA	600MWF	50MA	2.5V	.	.	20uV/C	163MW	.	.	.	.
LM307A	MUG	GPK	INT	.	.	+18V	-18V	70C	84dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	0.5M
LM307D	NAU	GPK	INT	.	.	+18V	-18V	70C	84dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	0.5M
LM307H	NAU	GPK	INT	.	.	+18V	-18V	70C	84dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	0.5M
LM307J	NAU	GPK	INT	.	.	+18V	-18V	70C	84dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	0.5M
LM307J-14	NAU	GPK	INT	.	.	+18V	-18V	70C	84dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	0.5M
LM307N	NAU	GPK	INT	.	.	+18V	-18V	70C	84dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	0.5M
LM307N(8)	MUG	GPK	INT	.	.	+18V	-18V	70C	84dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	0.5M
LM307N(14)	MUG	GPK	INT	.	.	+18V	-18V	70C	84dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	0.5M
LM307T	MUG	GPK	INT	.	.	+18V	-18V	70C	84dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	0.5M
LM307V	MUG	GPK	INT	.	.	+18V	-18V	70C	84dB	7.5MV	250NA	50NA	500MWF	5MA	12V	15V	30V	30uV/C	.	.	70dB	70dB	0.5M
LM308AD	NAU	SBA	EXT	.	.	+18V	-18V	70C	98dB	0.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	5uV/C	.	6MA	96dB	96dB	10M
LM308AF	SJU	SBA	EXT	.	.	+18V	-18V	70C	98dB	0.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	5uV/C	.	6MA	96dB	96dB	10M
LM308AH	NAU	SBA	EXT	.	.	+18V	-18V	70C	98dB	0.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	5uV/C	.	6MA	96dB	96dB	10M
LM308AH-1	NAU	SBA	EXT	.	.	+18V	-18V	70C	98dB	0.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	1uV/C	.	6MA	96dB	96dB	10M
LM308AH-2	NAU	SBA	EXT	.	.	+18V	-18V	70C	98dB	0.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	2uV/C	.	6MA	96dB	96dB	10M
LM308AJ	NAU	SBA	EXT	.	.	+18V	-18V	70C	98dB	0.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	5uV/C	.	6MA	96dB	96dB	10M
LM308AN	ADU	SBA	EXT	.	.	+18V	-18V	70C	98dB	0.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	5uV/C	.	6MA	96dB	96dB	10M
LM308AT	MUG	SBA	EXT	.	.	+18V	-18V	70C	98dB	0.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	5uV/C	.	6MA	96dB	96dB	10M
LM308D	NAU	SBA	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	30uV/C	.	6MA	80dB	80dB	10M
LM308D	MUG	SBA	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	30uV/C	.	6MA	80dB	80dB	10M
LM308H	NAU	SBA	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	30uV/C	.	6MA	80dB	80dB	10M
LM308J	NAU	SBA	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	30uV/C	.	6MA	80dB	80dB	10M
LM308N	NAU	SBA	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	30uV/C	.	6MA	80dB	80dB	10M
LM308N(8)	SJU	SBA	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	30uV/C	.	6MA	80dB	80dB	10M
LM308T	SJU	SBA	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	30uV/C	.	6MA	80dB	80dB	10M
LM308V	SJU	SBA	EXT	.	.	+18V	-18V	70C	88dB	7.5MV	7NA	1NA	500MWF	1MA	13V	15V	1V	30uV/C	.	6MA	80dB	80dB	10M
LM310D	NAU	VFA	INT	.	15V/uS	+18V	-18V	70C	0dB	7.5MV	7NA	.	500MWF	1MA	10V	15V	15V	50uV/C	.	6MA	.	70dB	10G
LM310F	NAU	VFA	INT	.	15V/uS	+18V	-18V	70C	0dB	7.5MV	7NA	.	500MWF	1MA	10V	15V	15V	50uV/C	.	6MA	.	70dB	10G
LM310H	NAU	VFA	INT	.	15V/uS	+18V	-18V	70C	0dB	7.5MV	7NA	.	500MWF	1MA	10V	15V	15V	50uV/C	.	6MA	.	70dB	10G
LM310J	NAU	VFA	INT	.	15V/uS	+18V	-18V	70C	0dB	7.5MV	7NA	.	500MWF	1MA	10V	15V	15V	50uV/C	.	6MA	.	70dB	10G
LM310J-8	NAU	VFA	INT	.	15V/uS	+18V	-18V	70C	0dB	7.5MV	7NA	.	500MWF	1MA	10V	15V	15V	50uV/C	.	6MA	.	70dB	10G
LM310N	NAU	VFA	INT	.	15V/uS	+18V	-18V	70C	0dB	7.5MV	7NA	.	500MWF	1MA	10V	15V	15V	50uV/C	.	6MA	.	70dB	10G
LM311A	SJU	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311D	NAU	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311F	MUG	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311F	NAU	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311H	NAU	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311J	NAU	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311J-8	NAU	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311N	NAU	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311N(8)	MUG	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311N-8	TDG	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311N(14)	MUG	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311N-14	NAU	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311T	SJU	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.
LM311V	SJU	CPR	EXT	.	.	+18V	-18V	70C	100dB	7.5MV	250NA	50NA	500MWF	.	.	15V	30V	.	.	8MA	.	.	.

For detailed explanations of column heading notations, see App. A

Also for ready references the more important abbreviations used in the column headings are listed below

**LEFT HAND PAGE**

APP = application

(codes at APP.E.)

CMRR = common mode rejection ratio

CMP = compensation (frequency)

$dV_{in}/dT$  = input offset voltage temperature drift

GBP = gain bandwidth product

$I_b$  = input bias current

$I_{in}$  = input bias offset current

$I_Q$  = quiescent supply current

MFR = manufacturer (codes at App.C.)

$P_Q$  = quiescent power consumer

PSRR = power supply rejection ratio

$V_{cm}$  = common mode input voltage rating

$V_{Di}$  = differential input voltage rating

$V_{in}$  = input offset voltage

$V_S$  = dc supply voltage

**RIGHT HAND PAGE**

Lead out coding summary

(details at APP.G.) for different cases (APP.F.)

A = gain adjust

B = bias adjust

C = case

E- = inverting input

E+ = non-inverting input

F, F\* = input frequency compensation

G = ground

J = high level input

K = output, open collector

L = output, open emitter

M = metal case

N = not connected

Q = special terminal

R, R\* = outputs

S = strobe

T, T\* = offset balance

V+ = +ve dc supply

V- = -ve dc supply

W = guard ring

X = blank position, no lead

++ = +ve supplementary dc supply

-- = -ve supplementary dc supply

$f, f^*$  = output frequency compensation

CASE (APP.F.)	LD 1	LD 2	LD 3	LD 4	LD 5	LD 6	LD 7	LD 8	LD 9	LD 10	LD 11	LD 12	LD 13	LD 14	LD 15	LD 16	EUROPE SUBSTITUTE	USA SUBSTITUTE	ISS	TYPE NUMBER	
DIL-8/1C	FT	E-	E+	V-	T*	R	V+	F*	.	.	.	.	.	.	.	.	SFC2301ADC	UA301AT	0	LM301AJ	
DIL-14/1C	N	N	FT	E-	E+	V-	N	N	T*	R	V+	F*	N	N	.	.	UA301AD	LM301AJ14	0	LM301AJ	
DIL-14/1P	N	N	FT	E-	E+	V-	N	N	T*	R	V+	F*	N	N	.	.	UA301AD	LM301AJ	0	LM301AJ14	
DIL-8/1P	FT	E-	E+	V-	T*	R	V+	F*	.	.	.	.	.	.	.	.	SFC2301ADC	UA301AT	0	LM301AN	
DIL-8/1P	FT	E-	E+	V-	T*	R	V+	F*	.	.	.	.	.	.	.	.	SFC2301ADC	LM301AJ	0	LM301AN(8)	
DIL-8/1P	FT	E-	E+	V-	T*	R	V+	F*	.	.	.	.	.	.	.	.	SFC2301ADC	LM301AJ	0	LM301AN-8	
T05-8/1M	FT	E-	E+	V-M	T*	R	V+	F*	.	.	.	.	.	.	.	.	SFC2301A	LM301AH	0	LM301AT	
DIL-8/1P	FT	E-	E+	V-	T*	R	V+	F*	.	.	.	.	.	.	.	.	SFC2301ADC	LM301AJ	0	LM301AV	
DIL-14/1C	N	N	FT	E-	E+	V-	N	N	T*	R	V+	F*	N	N	.	.	UA301AD	LM301AJ14	0	LM301D	
FLP-10/3C	N	FT	E-	E+	V-	T*	R	V+	F*	N	.	.	.	.	.	.	SFC2201APT	LM301AF	0	LM301F	
T05-8/1M	FT	E-	E+	V-M	T*	R	V+	F*	.	.	.	.	.	.	.	.	SFC2301A	LM301AH	0	LM301H	
DIL-14/1C	N	N	T	N	E+	V-	N	N	L	R	V+	T*	N	N	.	.	.	LM202D	0	LM302D	
T05-8/1M	T	N	E+	V-	L	R	V+	T*	.	.	.	.	.	.	.	.	.	UA302C	0	LM302H	
T05-8/1M	G	E+	E-	V-M	S1	S2	R	V+	.	.	.	.	.	.	.	.	.	SN72306L	0	LM306H	
DIL-14/1P	N	N	N	E-	E+	V-	N	N	N	R	V+	N	N	N	.	.	.	SN72307JA	0	LM307A	
DIL-14/1M	N	N	N	E-	E+	V-	N	N	N	R	V+	N	N	N	.	.	.	SN72307JA	0	LM307D	
T05-8/1M	N	E-	E+	V-M	N	R	V+	N	.	.	.	.	.	.	.	.	.	SFC2307	0	LM307H	
DIL-8/1C	N	E-	E+	V-	N	R	V+	N	.	.	.	.	.	.	.	.	.	SFC2307DC	0	LM307J	
DIL-14/1C	N	N	N	E-	E+	V-	N	N	N	R	V+	N	N	N	.	.	.	SN72307JA	0	LM307J-14	
DIL-8/1P	N	E-	E+	V-	N	R	V+	N	.	.	.	.	.	.	.	.	.	SFC2307DC	0	LM307N	
DIL-8/1P	N	E-	E+	V-	N	R	V+	N	.	.	.	.	.	.	.	.	.	SFC2307DC	0	LM307N(8)	
DIL-14/1P	N	N	N	E-	E+	V-	N	N	N	R	V+	N	N	N	.	.	.	SN72307JA	0	LM307N(14)	
T05-8/1M	N	E-	E+	V-M	N	R	V+	N	.	.	.	.	.	.	.	.	.	UA307H	0	LM307T	
DIL-8/1P	N	E-	E+	V-	N	R	V+	N	.	.	.	.	.	.	.	.	.	SFC2307DC	0	LM307V	
DIL-14/1G	N	F	N	E-	E+	N	V-	N	N	R	V+	F*	N	N	.	.	.	SN72308AJA	0	LM308AD	
DIL-14/1C	N	F	N	E-	E+	N	V-	N	N	R	V+	F*	N	N	.	.	.	UA308AD	0	LM308AF	
T05-8/1M	F	E-	E+	V-M	N	R	V+	F*	.	.	.	.	.	.	.	.	.	SFC2308A	0	LM308AH	
T05-8/1M	F	E-	E+	V-M	N	R	V+	F*	.	.	.	.	.	.	.	.	.	.	0	LM308AH-1	
T05-8/1M	F	E-	E+	V-M	N	R	V+	F*	.	.	.	.	.	.	.	.	.	.	0	LM308AH-2	
DIL-14/1C	N	F	N	E-	E+	N	V-	N	N	R	V+	F*	N	N	.	.	.	SN72308AJA	0	LM308AJ	
DIL-8/1P	F	E-	E+	V-	N	R	V+	F*	.	.	.	.	.	.	.	.	.	UA308AH	0	LM308AN	
T05-8/1M	F	E-	E+	V-M	N	R	V+	F*	.	.	.	.	.	.	.	.	.	SN72308JA	0	LM308AT	
DIL-14/1M	N	F	N	E-	E+	N	V-	N	N	R	V+	F*	N	N	.	.	.	SN72308JA	0	LM308D	
MDL-8/2P	F	E-	E+	V-	N	R	V+	F*	.	.	.	.	.	.	.	.	.	.	0	LM308D	
T05-8/1M	F	E-	E+	V-M	N	R	V+	F*	.	.	.	.	.	.	.	.	.	SFC2308	0	LM308H	
DIL-14/1C	N	F	N	E-	E+	N	V-	N	N	R	V+	F*	N	N	.	.	.	SN72308JA	0	LM308J	
DIL-8/1P	F	E-	E+	V-	N	R	V+	F*	.	.	.	.	.	.	.	.	.	SFC2308DC	0	LM308N	
DIL-8/1P	F	E-	E+	V-	N	R	V+	F*	.	.	.	.	.	.	.	.	.	SFC2308DC	0	LM308N(8)	
T05-8/1M	F	E-	E+	V-	N	R	V+	F*	.	.	.	.	.	.	.	.	.	UA308H	0	LM308T	
DIL-8/1P	F	E-	E+	V-	N	R	V+	F*	.	.	.	.	.	.	.	.	.	SFC2308DC	0	LM308V	
DIL-14/1M	N	N	T	N	E+	V-	N	N	L	R	V+	T*	N	N	.	.	.	SFC2310EC	0	LM310D	
FLP-10/3G	N	T	N	E+	V-	L	R	V+	T*	N	.	.	.	.	.	.	.	LM210F	0	LM310F	
T05-8/1M	T	N	E+	V-	L	R	V+	T*	.	.	.	.	.	.	.	.	.	SFC2310EC	0	LM310H	
DIL-14/1C	N	N	T	N	E+	V-	N	N	L	R	V+	T*	N	N	.	.	.	SFC2310EC	0	LM310J	
DIL-8/1C	T	N	E+	V-	L	R	V+	T*	.	.	.	.	.	.	.	.	.	SFC2310DC	0	LM310J-8	
DIL-8/1P	T	N	E+	V-	L	R	V+	T*	.	.	.	.	.	.	.	.	.	SFC2310DC	0	LM310N	
DIL-14/1P	N	G	E+	E-	N	V-	T	T*S	R	N	V+	N	N	N	.	.	.	SFC2311EC	0	LM311D	
DIL-14/1M	N	G	E+	E-	N	V-	T	T*S	R	N	V+	N	N	N	.	.	.	SFC2311EC	0	LM311D	
DIL-14/1C	N	G	E+	E-	N	V-	T	T*S	R	E+	E-	N	N	N	.	.	.	SFC2311EC	0	LM311F	
FLP-10/3G	G	E+	E-	N	V-	T	T*S	N	R	V+	.	.	.	.	.	.	.	.	SN72311FA	0	LM311F
T05-8/1M	G	E+	E-	V-	T	T*S	R	V+	.	.	.	.	.	.	.	.	.	SFC2311	0	LM311H	
DIL-14/1C	N	G	E+	E-	N	V-	T	T*S	R	N	V+	N	N	N	.	.	.	SFC2311EC	0	LM311J	
DIL-8/1C	G	E+	E-	V-	T	T*S	R	V+	.	.	.	.	.	.	.	.	.	SFC2311DC	0	LM311J-8	
DIL-8/1P	G	E+	E-	V-	T	T*S	R	V+	.	.	.	.	.	.	.	.	.	SFC2311DC	0	LM311N	
DIL-8/1P	G	E+	E-	V-	T	T*S	R	V+	.	.	.	.	.	.	.	.	.	UA311R	0	LM311N(8)	
DIL-8/1P	G	E+	E-	V-	T	T*S	R	V+	.	.	.	.	.	.	.	.	.	UA311R	0	LM311N(8)	
DIL-8/1P	G	E+	E-	V-	T	T*S	R	V+	.	.	.	.	.	.	.	.	.	SFC2311DC	0	LM311N-8	
DIL-14/1P	N	G	E+	E-	N	V-	T	T*S	R	N	V+	N	N	N	.	.	.	SFC2311EC	0	LM311N(14)	
DIL-14/1P	N	G	E+	E-	N	V-	T	T*S	R	N	V+	N	N	N	.	.	.	SFC2311EC	0	LM311N-14	
T05-8/1M	G	E+	E-	V-	T	T*S	R	V+	.	.	.	.	.	.	.	.	.	UA311H	0	LM311T	
DIL-8/1P	G	E+	E-	V-	T	T*S	R	V+	.	.	.	.	.	.	.	.	.	UA311R	0	LM311V	

# Appendix A

# Explanatory notes to tabulations

The general layout plan of the information in the tables of this compendium should be immediately evident from the data tabulation explanatory chart set out overleaf.

Supporting Appendices with additional information are:

- App. B Glossary of *Opamp Terms*
- App. C Tabulation *Codes for Manufacturers*
- App. D IC Manufacturers' *House Numbers*
- App. E Tabulation *Codes for Applications*
- App. F *Case Outline and Leadout Diagrams*
- App. G Codes for *Leadout Connections*

Unit symbols used in the tables are:

- A = amperes
- C = °centigrade
- dB = decibels
- G = gigaohms (megohms  $\times 10^3$ )
- GHZ = gigahertz (megahertz  $\times 10^3$ )
- K = kilohms
- KHZ = kilohertz
- M = megohms
- MA = milliamperes, mA
- MAX = maximum
- MHZ = megahertz
- MIN = minimum
- MV = millivolts
- MWC = milliwatts, case at 25C
- MWF = milliwatts, free air at 25C
- MWH = milliwatts, heat sink, 25C
- NA = nanoamps (microamps  $\times 10^{-3}$ )
- NV = nanovolts (microvolts  $\times 10^{-3}$ )
- PA = picoamps (microamps  $\times 10^{-12}$ )
- R = ohms
- T = teraohms (megohms  $\times 10^6$ )
- V = volts
- WC = watts, case at 25C
- WF = watts, free air at 25C
- WH = watts, heatsink, 25C
- $\mu$ A = microamps
- $\mu$ S = microseconds
- $\mu$ V = microvolts
- $\mu$ W = microwatts
- $\mu$ WF = microwatts, free air at 25C

Where a unit symbol appears in the middle of a value, it indicates the position of the decimal point, e.g. 3K3 = 3.3K.

Appendix A

TYPE NUMBER	MFR	APP	CMP	GBP MIN	SLEW RATE MIN	V <sub>S+</sub> MAX	V <sub>S-</sub> MAX	T <sub>OP</sub> MAX	A <sub>VOL</sub> MIN	V <sub>IO</sub> MAX	I <sub>B</sub> MAX	I <sub>IO</sub> MAX	P <sub>TOT</sub> MAX	I <sub>OUT</sub> MIN	V <sub>OUT</sub> MIN	V <sub>ICM</sub> MAX	V <sub>IDF</sub> MAX	dV <sub>IO</sub> /dT MAX	P <sub>O</sub> MAX	I <sub>O</sub> MAX	CMRR MIN	PSRR MIN	R <sub>IN</sub> MIN
(EXAMPLE) LH0022CH	NAU	FET	INT	.3MHZ	1V/μS	+22V	-22V	85C	97dB	6MV	25pA	5pA	500mW	10MA	10V	15V	30V	15μV/C	85mW	3MA	70dB	70dB	0.1T
<p>TYPE No. NUMERO-ALPHABETIC LISTING</p> <p>MFR = MANUFACTURER CODED AS APP. C</p> <p>APP = APPLICATION CODED AS APP. E</p> <p>CMP = FREQUENCY COMPENSATION WITH INT = INTERNAL EXT = EXTERNAL</p> <p>GBP MIN = UNITY GAIN BANDWIDTH PRODUCT, MIN.; IN KHZ, MHZ, or GHZ</p> <p>SLEW RATE, MIN. IN VOLTS PER MICROSECOND. V/μS</p> <p>V<sub>S+</sub> MAX = MAX. PERMISSIBLE +VE DC SUPPLY VOLTAGE IN VOLTS, V</p> <p>V<sub>S-</sub> MAX = MAX. PERMISSIBLE -VE DC SUPPLY VOLTAGE IN VOLTS, V</p> <p>T<sub>OP</sub> MAX = MAX. PERMISSIBLE OPERATIONAL AMBIENT TEMPERATURE IN °C.</p> <p>A<sub>VOL</sub> MIN = MIN. OPEN-LOOP VOLTAGE GAIN IN DB</p> <p>V<sub>IO</sub> MAX = MAX INPUT OFFSET VOLTAGE AT 25°C IN MV or μV.</p> <p>I<sub>B</sub> MAX = MAX. INPUT BIAS CURRENT AT 25°C IN MA, μA, nA or pA</p>												<p>I<sub>O</sub> MAX = MAX. QUIESCENT (NO SIGNAL, NO LOAD) CURRENT CONSUMPTION IN MA</p> <p>P<sub>O</sub> MAX = MAX. QUIESCENT (NO SIGNAL, NO LOAD) POWER CONSUMPTION IN MW</p> <p>dV<sub>IO</sub>/dT MAX = MAX. INPUT OFFSET VOLTAGE TEMPERATURE DRIFT IN μV/C OR MV/C</p> <p>V<sub>IDF</sub> MAX = MAX. PERMISSIBLE DIFFERENTIAL INPUT VOLTAGE IN V.</p> <p>V<sub>ICM</sub> MAX = MAX. PERMISSIBLE COMMON-MODE INPUT VOLTAGE IN VOLTS, V</p> <p>V<sub>OUT</sub> MIN = GUARANTEED MIN. OUTPUT VOLTAGE, PEAK VALUE, IN VOLTS, V</p> <p>I<sub>OUT</sub> MIN = GUARANTEED MINIMUM OUTPUT CURRENT, PEAK VALUE, IN MA OR μA.</p> <p>P<sub>TOT</sub> MAX = MAX. PERMISSIBLE POWER DISSIPATION IN W, mW, μW WITH F = FREE AIR 25°C, C = CASE 25°C, H = HEATSINK 25°C.</p> <p>I<sub>IO</sub> MAX = MAX. INPUT OFFSET CURRENT AT 25°C IN MA, μA, nA, OR pA</p>											
<p>NOTE: FOR FURTHER EXPLANATION OF SPECIAL TERMS SEE APP. B)</p>												<p>* R<sub>IN</sub> EXPRESSED AS OHMS (R), KILOHMS (K), MEGOHMS (M), GIGAOHMS (G) OR TERAHMS (T)</p>											

## Appendix A

### LEFT HAND PAGE

For detailed explanations of column heading notations, see App. A. Also for ready references the more important abbreviations used in the column headings are listed below:

- APP = application (codes at APP.E.)
- CMRR = common mode rejection ratio
- CMP = compensation (frequency)
- $dV_{io}/dT$  = input offset voltage temperature drift
- GBP = gain bandwidth product
- $I_b$  = input bias current
- $I_{io}$  = input bias offset current
- $I_Q$  = quiescent supply current
- MFR = manufacturer (codes at App.C.)
- $P_Q$  = quiescent power consumer
- PSRR = power supply rejection ratio
- $V_{icm}$  = common mode input voltage rating
- $V_{idc}$  = differential input voltage rating
- $V_{io}$  = input offset voltage
- $V_S$  = dc supply voltage

### RIGHT HAND PAGE

Lead out coding summary (details at APP.G.) for different cases (APP.F.)

- A = gain adjust
- B = bias adjust
- C = case
- E- = inverting input
- E+ = non-inverting input
- F,F\* = input frequency compensation
- G = ground
- J = high level input
- K = output, open collector
- L = output, open emitter
- M = metal case
- N = not connected
- Q = special terminal
- R,R\* = outputs
- S = strobe
- T,T\* = offset balance
- V+ = +ve dc supply
- V- = -ve dc supply
- W = guard ring
- X = blank position, no lead
- + + = +ve supplementary dc supply
- - = -ve supplementary dc supply
- $\phi, \phi^*$  = output frequency compensation

CASE (APP. F.)	LD 1	LD 2	LD 3	LD 4	LD 5	LD 6	LD 7	LD 8	LD 9	LD 10	LD 11	LD 12	LD 13	LD 14	LD 15	LD 16	EUROPE SUBSTITUTION	USA SUBSTITUTION	ISS	TYPE NUMBER	
T05-8/1M	T	E-	E+	V-	T*	R	V+	N	.	.	.	.	.	.	.	.	.	.	LH0022H	0	LH0022CH

CASE = PACKAGE OF DIFFERENT TYPES CODED ACCORDING TO APP. F - FIRST NUMBER INDICATES NUMBER OF LEAD POSITIONS EG DIL-14 = 14 LEAD DUAL-IN-LINE PACKAGE

TYPE No. REPEATED ON R.H. MARGIN

ISS = ISSUE NUMBER OF DATA ENTRY

USA SUBSTITUTE = SUGGESTED ALTERNATIVE AVAILABLE IN USA.

EURO SUBSTITUTE = PROELECTRON STANDARD OR OTHER TYPE AVAILABLE IN EUROPE

LD1, LD2, ETC = LEAD NUMBERS WITH CONNECTIONS ACCORDING TO PAGE FOOTNOTE OR APP. G.

# Appendix C

## Tabulation Codes for Manufacturers

<b>ADU</b>	<b>Advanced Micro Devices Inc.,</b> 901 Thompson Pl., Sunnyvale, CA 94086, USA	<b>ITU</b>	DA14 5HT, UK <b>ITT Semiconductors</b> 74 Commerce Way, Woburn, MA, 01801, USA
<b>ANG</b>	<b>Analog Devices Ltd,</b> Central Ave., East Molesey, KT8 9BR, Surrey, UK	<b>MNG</b>	<b>Mitsubishi Shoji Kaisha Ltd,</b> Bow Bells House, Bread St., London, EC4, UK
<b>ANU</b>	<b>Analog Devices Inc.,</b> P.O. Box 280, Norwood, Mass., 02062	<b>MNJ</b>	<b>Mitsubishi Electric Corp.,</b> 2-12 Marunouchi, Chiyoda-ku, Tokyo, Japan
<b>BLG</b>	<b>Bell &amp; Howell Ltd,</b> Lennox Road, Basingstoke, Hants, UK	<b>MTG</b>	<b>Motorola Ltd</b> (Semiconductor Products Div.), York House, Empire Way, Wembley, Middlesex, HA9 0PR, UK
<b>BLU</b>	<b>Bell &amp; Howell</b> (Control Products Divison), 706 Bostwick Ave, Bridgeport, Conn. 06605, USA	<b>MTU</b>	<b>Motorola Semiconductor Products Inc.,</b> 5005 E. McDowell Road, Phoenix, AZ, 85008, USA
<b>BUG</b>	<b>Burr-Brown International Ltd,</b> 17 Exchange Rd, Watford, WQD1 7EB, Herts., UK	<b>MUG</b>	<b>Mullard Ltd,</b> Mullard House, Torrington Place, London, WC1E 7HD, UK
<b>BUU</b>	<b>Burr-Brown Research Corp.,</b> P.O. Box 11400, Tucson, AZ, 85734, USA	<b>NAG</b>	<b>National Semiconductor (UK) Ltd,</b> Harpur Centre, Bedford, MK40 3LF, UK
<b>CMG</b>	<b>Computing Techniques Ltd,</b> Brookers Rd, Billingshurst, Sussex, RH14 9RZ, UK	<b>NAU</b>	<b>National Semiconductor Corp.,</b> 2900 Semiconductor Drive, Santa Clara, CA, 95051, USA
<b>DAG</b>	<b>Datel UK Ltd,</b> Stephenson Close, Portway Ind. Estate, Andover, Hants, UK	<b>NIJ</b>	<b>Nippon Electric Co. Ltd,</b> 1753 Shimonumabe, Nakahara-ku, Kawasaki, Japan
<b>DAU</b>	<b>Datel Systems Inc.,</b> 1020 Turnpike St., Canton, MA 02021, USA	<b>OAU</b>	<b>Opamp Labs Inc.,</b> 1033 N. Sycamore Ave., Los Angeles, CA 90038, USA
<b>FAG</b>	<b>Fairchild Camera &amp; Instrument (UK) Ltd,</b> 230 High St., Potters Bar, Herts., UK	<b>OBS</b>	Obsolete – no longer commercially available.
<b>FAU</b>	<b>Fairchild Semiconductor</b> 464 Ellis St., Mountain View, CA 94042, USA	<b>OTU</b>	<b>Optical Electronics Inc.,</b> P.O. Box 11140, Tucson, AZ, 85734, USA
<b>FEG</b>	<b>Ferranti Ltd,</b> (Electronic Department), Gem Mill, Chadderton, Oldham, Lancs., OL9 8NP, UK	<b>PLG</b>	<b>Plessey Semiconductors,</b> Cheney Manor, Swindon, Wilts., SN2 2QW, UK
<b>FUJ</b>	<b>Fujitsu Ltd,</b> 1015 Kamikodanaka, Kawasaki, Japan	<b>PRG</b>	<b>Precision Monolithics</b> (Bourns Trimpot Ltd) 17/27 High St., Hounslow, Middlesex, UK
<b>HAG</b>	<b>Harris Semiconductor (Memec) Ltd,</b> The Firs, Whitchurch, Nr. Aylesbury, Bucks., HP22 4JU, UK	<b>PRU</b>	<b>Precision Monolithics (Bourns) Inc.,</b> 1500 Space Park Drive, Santa Clara, CA, 95050, USA
<b>HAU</b>	<b>Harris Semiconductor</b> P.O. Box 883, Melbourne, FL, 32901, USA	<b>RAG</b>	<b>Raytheon Semiconductor</b> The Pinnacles, Harlow, Essex, CM19 5BB, UK
<b>HIJ</b>	<b>Hitachi Ltd</b> (Semiconductor and IC Div.), 1450 Josuihonimachi, Kodaira City, Tokyo, Japan	<b>RAU</b>	<b>Raytheon Semiconductor,</b> 350 Ellis Street, Mountain View, CA, 94042, USA
<b>ING</b>	<b>Intersil Inc.,</b> 8 Tessa Rd, Richfield Trading Estate, Reading, Berks., UK	<b>RCG</b>	<b>RCA (Great Britain) Ltd,</b> Lincoln Way, Windmill Road, Sunbury-on- Thames, Middlesex, UK
<b>INU</b>	<b>Intersil Inc.,</b> 10900 N. Tantau Ave, Cupertino, CA, 95014, USA	<b>RCU</b>	<b>RCA Solid State Division</b> Route 202, Somerville, NJ, 08876, USA
<b>ITG</b>	<b>ITT Semiconductors</b> Maidstone Rd, Fooks Cray, Sidcup, Kent,	<b>SAJ</b>	<b>Sanken Electric Co. Ltd,</b> 1-22-8 Nishi-Ikebukuro, Toshima-Ku, Tokyo, Japan

Appendix C

<b>SGG</b>	<b>SGS-ATES (UK) Ltd,</b> Planar House, Walton Street, Aylesbury, Bucks., UK	<b>SPU</b>	<b>Sprague Electric Company</b> (Semiconductor Div.), 115 Northeast Cutoff, Worcester, MA, 01606, USA
<b>SGI</b>	<b>SGS-ATES Componenti Spa,</b> Via Olivetti, 2 Agrate Brianza, 20041, Milan, Italy	<b>TDG</b>	<b>Teledyne Semiconductor,</b> Heathrow House, Bath Road, Cranford, Hounslow, Middlesex, TW5 9QP, UK
<b>SHG</b>	<b>Shindengen Hyokuto Boeki Haisha Ltd,</b> St. Alphage House, Fore St., London, EC2Y 5DA, UK	<b>TDU</b>	<b>Teledyne (Amelco) Semiconductor,</b> 1300 Terra Bella Ave, Mountain View, CA, 94032, USA
<b>SHJ</b>	<b>Shindengen Electric Mfg Co., Ltd,</b> New Ohtemachi Bldng, 2-1, 2-chome, Ohtemachi, Chiyoda-ku, Tokyo, Japan	<b>TEB</b>	<b>Teledyne-Philbrick,</b> Heathrow House, Bath Road, Cranford, Hounslow, Middlesex, TW5 9QP, UK
<b>SIG</b>	<b>Siemens Ltd,</b> Great West Road, Brentford, Middlesex, TW8 9DG, UK	<b>TEU</b>	<b>Teledyne-Philbrick,</b> Allied Drive at Route 128, Dedham, MA, 02026, USA
<b>SIW</b>	<b>Siemens Aktiengesellschaft,</b> Richard-Strauss-Strasse 76, D-8000 Munchen 2, Postfach 202109, W. Germany	<b>TGG</b>	<b>Texas Instruments Ltd,</b> Manton Lane, Bedford, UK
<b>SJG</b>	<b>Signetics International Corporation</b> Yeoman House, 63 Croydon Rd, London, SE20, UK	<b>TGU</b>	<b>Texas Instruments Inc.</b> (Components Group), P.O. Box 5012, Dallas, Texas, 75222, USA
<b>SJU</b>	<b>Signetics Corp.,</b> 811 East Arques Ave, Sunnydale, CA. 94086, USA	<b>THF</b>	<b>Thomson-CSF (Sescosem),</b> 50 Rue Jean Pierre Timbaud, BP 120, 92403, Courbevoie, France
<b>SKU</b>	<b>Silicon General Inc.,</b> 7382 Bolsa Avenue, Westminster, CA, 92683, USA	<b>THG</b>	<b>Thomson-CSF (UK) Ltd,</b> Ringway House, Bell Rd, Daneshill, Basingstoke, Hants., RG24 0QG, UK.
<b>SLG</b>	<b>Siliconix Ltd,</b> 30A High St., Thatcham, Newbury, Berks., RG13 4JG, UK	<b>TKJ</b>	<b>Tokyo Sanyo Electric Co. Ltd</b> (Semiconductor Div.), Oizumachi, Oragun, Gumma, Japan
<b>SLU</b>	<b>Siliconix Incorporated,</b> 2201 Laurelwood Road, Santa Clara, CA, 95054, USA	<b>TOG</b>	<b>Toshiba (UK) Ltd,</b> Toshiba House, Great South West Rd, Feltham, Middlesex, UK
<b>SOJ</b>	<b>Sony Semiconductor Corp.,</b> 14-1, Asa hi-sho 4, Atsuigi-shi, Kanagawa-ken, 243, Japan	<b>TOJ</b>	<b>Toshiba (Tokyo Shibaura) Electric Co.,</b> 2-1, 5-chome, Ginza Chuo-ku, Tokyo, Japan
<b>SPG</b>	<b>Sprague Electric (UK) Ltd,</b> 159 High St., Yiewsley, W. Drayton, Middlesex, UB7 7RY, UK	<b>TRU</b>	<b>Transitron Electronic Corp.,</b> 168 Albion St., Wakefield, MA, 01881, USA
		<b>ZEU</b>	<b>Zeltex Inc.,</b> 940 Detroit Ave, Concord, CA, 94518, USA

# Appendix D

## IC Manufacturers'

### House Numbers

(General Note: Manufacturers often adopt their own 'in-house' serial numbering for their ICs. Listed below are the initial letters of numerical series used by different manufacturers.)

<b>AD</b>	Analog Devices	<b>OP</b>	Precision Monolithics
<b>ADO</b>	Analog Devices	<b>P</b>	Teledyne-Philbrick
<b>AM</b>	Advanced Micro Devices; Datel	<b>PF</b>	Teledyne-Philbrick
<b>AMD</b>	Advanced Micro Devices	<b>PG</b>	General Instruments (obs.)
<b>AMLM</b>	Advanced Micro Devices	<b>PP</b>	Teledyne-Philbrick
<b>AMSSS</b>	Advanced Micro Devices	<b>RA</b>	Radiation (now Harris)
<b>AMU</b>	Advanced Micro Devices	<b>RC</b>	Raytheon
<b>C</b>	Bell & Howell	<b>RL</b>	Raytheon
<b>CA</b>	RCA	<b>RM</b>	Raytheon
<b>CIA</b>	Teledyne-Philbrick	<b>RSN</b>	Raytheon
<b>CMP</b>	Precision Monolithics	<b>RV</b>	Raytheon
<b>CN</b>	Ferranti	<b>S</b>	Signetics
<b>DA</b>	Teledyne-Philbrick	<b>SA</b>	Teledyne-Philbrick
<b>EP</b>	Teledyne-Philbrick	<b>SE</b>	Signetics; Mullard
<b>ESL</b>	Teledyne-Philbrick	<b>SFC</b>	Thomson-CSF
<b>FSL</b>	Teledyne-Philbrick	<b>SG</b>	Silicon General
<b>FSS</b>	Ferranti	<b>SH</b>	Fairchild
<b>HA</b>	Harris	<b>SK</b>	RCA
<b>HEPC</b>	Motorola	<b>SL</b>	Plessey; Teledyne-Philbrick
<b>ICH</b>	Intersil	<b>SN</b>	Texas Instruments
<b>ICL</b>	Intersil	<b>SP</b>	Teledyne-Philbrick
<b>JM</b>	Fairchild	<b>SQ</b>	Teledyne-Philbrick
<b>JSF</b>	Thomson-CSF	<b>SSS</b>	Precision Monolithics
<b>L</b>	Analog Devices; SGS-ATES	<b>SU</b>	Signetics; Mullard
<b>LA</b>	Teledyne-Philbrick	<b>T</b>	Teledyne-Philbrick Transitron
<b>LF</b>	National Semiconductor	<b>TA</b>	AEG-Telefunken
<b>LH</b>	National Semiconductor	<b>TAA</b>	Proelectron Standard
<b>LM</b>	National Semiconductor	<b>TBA</b>	Proelectron Standard
<b>M</b>	Mitsubishi	<b>TBB</b>	Proelectron Standard
<b>MC</b>	Motorola Semiconductors	<b>TBC</b>	Proelectron Standard
<b>MCC</b>	Motorola Semiconductors	<b>TBE</b>	Proelectron Standard
<b>MCCF</b>	Motorola Semiconductors	<b>TCA</b>	Proelectron Standard
<b>MCE</b>	Motorola Semiconductors	<b>TDA</b>	Proelectron Standard
<b>MCH</b>	Motorola Semiconductors	<b>TDB</b>	Proelectron Standard
<b>MIC</b>	ITT Semiconductors	<b>TDC</b>	Proelectron Standard
<b>MLF</b>	Motorola; Teledyne-Philbrick	<b>TDE</b>	Proelectron Standard
<b>MLM</b>	Motorola Semiconductors	<b>TL</b>	AEG-Telefunken
<b>MLMC</b>	Motorola Semiconductors	<b>TOA</b>	Transitron
<b>MONO-OP</b>	Precision Monolithics	<b>TSC</b>	Transitron
<b>N</b>	Signetics; Mullard	<b>U</b>	Fairchild
<b>NC</b>	General Instruments (obs.)	<b>ULN</b>	Sprague
<b>NE</b>	Signetics; Mullard	<b>ULS</b>	Sprague
<b>NH</b>	National Semiconductor	<b>USL</b>	Teledyne-Philbrick
		<b>ZA</b>	Zeltex
		<b>ZEL</b>	Zeltex
		<b>ZLD</b>	Ferranti
		<b>ZN</b>	Ferranti
		<b>μA</b>	Fairchild



# Appendix E

## Tabulation Codes for Applications

<b>BDO</b>	Balanced differential-output amplifier	<b>PAA</b>	Parametric amplifier
<b>CDA</b>	Current-difference amplifier	<b>PIA</b>	Precision instrumentation amplifier
<b>CHP</b>	Chopper-stabilized amplifier	<b>PRA</b>	Programmable opamp
<b>CPR</b>	DC comparator	<b>QCD</b>	Quad current-difference amplifier
<b>DBD</b>	Dual balanced differential-output amplifier	<b>QCP</b>	Quad comparator
<b>DCP</b>	Dual Comparator	<b>QFE</b>	Quad fet-input opamp
<b>DFE</b>	Dual fet-input opamp	<b>Q GK</b>	Quad general-purpose, internally-compensated, opamp
<b>DGK</b>	Dual general purpose opamp	<b>QGU</b>	Quad general-purpose, uncompensated, opamp
<b>DGU</b>	Dual general-purpose uncompensated opamp	<b>QLQ</b>	Quad low-quiescent-power opamp
<b>DHS</b>	Dual high-slew-rate opamp	<b>QPI</b>	Quad precision instrumentation amplifier
<b>DLN</b>	Dual low-noise opamp	<b>QPR</b>	Quad programmable opamp
<b>DPI</b>	Dual precision instrumentation amplifier	<b>QSB</b>	Quad super-beta opamp
<b>DPR</b>	Dual programmable opamp	<b>SBA</b>	Super-beta opamp
<b>DSB</b>	Dual super-beta opamp	<b>TCP</b>	Triple comparator
<b>FET</b>	Fet-input opamp	<b>TFE</b>	Triple fet-input opamp
<b>GPK</b>	General-purpose, internally-compensated, opamp	<b>TGK</b>	Triple general-purpose, internally compensated, opamp
<b>GPU</b>	General-purpose, uncompensated, opamp	<b>TGU</b>	Triple general-purpose, uncompensated, opamp
<b>HCO</b>	High current output opamp	<b>TLN</b>	Triple low-noise opamp
<b>HIR</b>	High input resistance opamp	<b>TLP</b>	Triple low-quiescent-power opamp
<b>HPO</b>	High power output opamp	<b>TOT</b>	Triple operational transconductance amplifier
<b>HSR</b>	High slew rate opamp	<b>TPI</b>	Triple precision instrumentation amplifier
<b>HVO</b>	High voltage output opamp	<b>TPR</b>	Triple programmable opamp
<b>LBC</b>	Low input bias current opamp	<b>TSB</b>	Triple super-beta opamp
<b>LCD</b>	Low input offset current drift opamp	<b>VFA</b>	Voltage-follower amplifier
<b>LNA</b>	Low noise opamp	<b>WBA</b>	Wide-band opamp
<b>LOC</b>	Low input offset current opamp	<b>XHG</b>	Extra-high-gain opamp
<b>LOV</b>	Low input offset voltage opamp	<b>XLP</b>	Extra-low quiescent power opamp
<b>LQP</b>	Low quiescent power opamp	<b>XSR</b>	Extra-high slew rate opamp
<b>LVD</b>	Low input offset voltage drift opamp	<b>XWB</b>	Extra-wide-band opamp
<b>MWB</b>	Medium-wideband opamp		
<b>OTA</b>	Operational transconductance amplifier		

# Appendix G

## Codes for Leadout Connections

### *I: Connection Codes in Serial Order*

A	= Gain adjust, 1
A*	= Gain adjust, 2
B	= Bias adjust or set
C	= Case, package, screen
E+	= Input, non-inverting, low-level
E-	= Input, inverting, low-level
F	= Input frequency compensation, 1
F*	= Input frequency compensation, 2
G	= Ground, common, earth, zero volts
J+	= Input, non-inverting, high-level
J-	= Input, inverting, high-level
K	= Output, open collector
L	= Output, open emitter
M	= Metal casing
N	= Not connected, i.e. isolated lead
Q	= Special terminal (consult manufacturer's data)
R	= Output, 1
R*	= Output, 2
S	= Strobe
T	= Offset balance, trim or null, 1
T*	= Offset balance, trim or null, 2
V+	= +ve dc supply
V-	= -ve dc supply
W	= Guard ring
X	= Blank position, lead omitted
++	= +ve supplementary dc supply
--	= -ve supplementary dc supply
φ	= Output frequency compensation, 1
φ*	= Output frequency compensation, 2

### *II: Lead Assignments in Alphabetical Order*

Balance, offset, 1 = T
Balance, offset, 2 = T*
Bias adjust = B
Blank position, without lead = X
Case = C
Compensation, input, 1 = F
Compensation, input, 2 = F*
Compensation, output, 1 = φ
Compensation, output, 2 = φ*
DC supply, +ve = V+
DC supply, -ve = V-
Frequency compensation, input, 1 = F
Frequency compensation, input, 2 = F*
Frequency compensation, output, 1 = φ
Frequency compensation, output, 2 = φ*
Gain adjust, 1 = A
Gain adjust, 2 = A*
Ground = G
Guard ring = W
Input, inverting, high-level = J-
Input, non-inverting, high-level = J+
Input, inverting, low-level = E-
Input, non-inverting, low-level = E+
Input offset voltage, adjust, 1 = T
Input offset voltage, adjust, 2 = T*
Lead omitted, blank position = X
Lead in position but not connected = N
Metal case = M
Not connected, but lead in position = N
Null, offset, 1 = T
Null, offset, 2 = T*
Offset voltage adjust, 1 = T
Offset voltage adjust, 2 = T*
Output, 1 = R
Output, 2 = R*
Output, open-collector = K
Output, open-emitter = L
Package = C
Special purpose terminal (data sheet to be consulted) = Q
Strobe = S
Supply, dc, +ve = V+
Supply, dc, -ve = V-
Supply, dc, supplementary, +ve = ++
Supply, dc, supplementary, -ve = --
Trim (offset voltage), 1 = T
Trim (offset voltage), 2 = T*

Appendix F



Appendix F

