

TYPE NUMBER	MFR	APP	COMP	GBP MIN	SLEW RATE MIN	V <sub>S+</sub> MAX	V <sub>S-</sub> MAX	T <sub>DP</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>Q</sub> MAX	I <sub>Q</sub> MAX	CM RR MIN	PS RR MIN	R <sub>IN</sub> MIN
NE535N(8)	MUG	HSR	INT	.3MHZ	5V/US	+18V	-18V	70C	84dB	6MV	200NA	80NA	500MWF	5MA	12V	13V	30V	10UV/C		3MA	80dB	100dB	
NE535T	MVG	HSR	INT	.3MHZ	5V/US	+18V	-18V	70C	84dB	6MV	200NA	80NA	500MWF	5MA	12V	13V	30V	10UV/C		3MA	80dB	100dB	
NE535V	MUG	HSR	INT	.3MHZ	5V/US	+18V	-18V	70C	84dB	6MV	200NA	80NA	500MWF	5MA	12V	13V	30V	10UV/C		3MA	80dB	100dB	
NE536T	SJU	FET	INT	.5MHZ	3V/US	+22V	-22V	70C	94dB	90MV	100PA	10PA	500MWF	17MA	10V	22V	30V	300UV/C	350MW	8MA	64dB	70dB	50G
NE540L	SJU	HCO	EXT		100V/US	+22V	-22V	70C		10MV	5UA	1UA	500MWF	80MA						20MA	70dB	60dB	10K
NE592A	SJU	BDO	EXT	20MHZ		+8V	-8V	70C	48dB	6MV	30UA	5UA	670MWF	2MA	1.5V	6V	5V			24MA	60dB	50dB	2K
NE592F	MUG	BDO	EXT	20MHZ		+8V	-8V	70C	48dB	6MV	30UA	5UA	670MWF	2MA	1.5V	6V	5V			24MA	60dB	50dB	2K
NE592K	SJU	BDO	EXT	20MHZ		+8V	-8V	70C	48dB	6MV	30UA	5UA	500MWF	2MA	1.5V	6V	5V			24MA	60dB	50dB	2K
NE592N(14)	MUG	BDO	EXT	20MHZ		+8V	-8V	70C	48dB	6MV	30UA	5UA	670MWF	2MA	1.5V	6V	5V			24MA	60dB	50dB	2K
NH0001CH	OBS	XLP	EXT			+20V	-20V	85C	88dB	1MV	100NA	20NA	400MWF	5MA	10V	20V	7V			1MA	70dB	70dB	500K
NH0001H	OBS	XLP	EXT			+20V	-20V	125C	88dB	1MV	100NA	20NA	400MWF	5MA	10V	20V	7V			1MA	70dB	70dB	500K
NH0003CH	OBS	WBA	EXT			+20V	-20V	85C	86dB	3MV	2UA	0.2UA	500MWF	0.1A	10V	20V	7V	20UV/C		3MA	70dB	70dB	25K
NH0003H	OBS	WBA	EXT			+20V	-20V	125C	86dB	3MV	2UA	0.2UA	500MWF	0.1A	10V	20V	7V	20UV/C		3MA	70dB	70dB	25K
NH0004CH	OBS	HVO	EXT			+45V	-45V	85C	90dB	1.5MV	120NA	45NA	400MWF	6MA	30V	45V	7V	20UV/C		2MA	70dB	70dB	
NH0004H	OBS	HVO	EXT			+45V	-45V	125C	90dB	1MV	100NA	20NA	400MWF	6MA	30V	45V	7V	20UV/C		2MA	70dB	70dB	
NH0005AH	OBS	WBA	EXT			+20V	-20V	125C	72dB	3MV	25NA	5NA	400MWF	50MA	6V	20V	15V	50UV/C		5MA	60dB	60dB	1M
NH0005CH	OBS	WBA	EXT			+20V	-20V	85C	66dB	10MV	100NA	25NA	400MWF	50MA	6V	20V	15V			5MA	50dB	50dB	0.5M
NH0005H	NAU	WBA	EXT			+20V	-20V	125C	66dB	10MV	50NA	20NA	400MWF	50MA	6V	20V	15V	100UV/C		5MA	55dB	55dB	1M
OP-01CJ	PRU	HSR	INT		5V/US	+20V	-20V	70C	88dB	5MV	100NA	20NA	500MWF	6MA	12V	15V	30V	10UV/C	90MW		80dB	80dB	
OP-01CP	OBS	HSR	INT		5V/US	+20V	-20V	70C	88dB	5MV	100NA	20NA	500MWF	6MA	12V	15V	30V	10UV/C	90MW		80dB	80dB	
OP-01CY	PRU	HSR	INT		5V/US	+20V	-20V	70C	88dB	5MV	100NA	20NA	500MWF	6MA	12V	15V	30V	10UV/C	90MW		80dB	80dB	
OP-01EJ	PRU	HSR	INT		5V/US	+22V	-22V	70C	94dB	2MV	50NA	2NA	500MWF	6MA	12V	15V	30V	8UV/C	90MW		80dB	80dB	
OP-01EP	OBS	HSR	INT		5V/US	+22V	-22V	70C	94dB	2MV	50NA	2NA	500MWF	6MA	12V	15V	30V	8UV/C	90MW		80dB	80dB	
OP-01EY	PRU	HSR	INT		5V/US	+22V	-22V	70C	94dB	2MV	50NA	2NA	500MWF	6MA	12V	15V	30V	8UV/C	90MW		80dB	80dB	
OP-01FJ	PRU	HSR	INT		5V/US	+22V	-22V	125C	94dB	2MV	50NA	5NA	500MWF	6MA	12V	15V	30V	8UV/C	90MW		80dB	80dB	
OP-01FL	PRU	HSR	INT		5V/US	+22V	-22V	125C	94dB	2MV	50NA	5NA	500MWF	6MA	12V	15V	30V	8UV/C	90MW		80dB	80dB	
OP-01FP	OBS	HSR	INT		5V/US	+22V	-22V	125C	94dB	2MV	50NA	5NA	500MWF	6MA	12V	15V	30V	8UV/C	90MW		80dB	80dB	
OP-01FY	PRU	HSR	INT		5V/US	+22V	-22V	125C	94dB	2MV	50NA	5NA	500MWF	6MA	12V	15V	30V	8UV/C	90MW		80dB	80dB	
OP-01GJ	PRU	HSR	INT		5V/US	+20V	-20V	125C	88dB	5MV	100NA	20NA	500MWF	6MA	12V	15V	30V	10UV/C	90MW		80dB	80dB	
OP-01GL	PRU	HSR	INT		5V/US	+20V	-20V	125C	88dB	5MV	100NA	20NA	500MWF	6MA	12V	15V	30V	10UV/C	90MW		80dB	80dB	
OP-01GP	OBS	HSR	INT		5V/US	+20V	-20V	125C	88dB	5MV	100NA	20NA	500MWF	6MA	12V	15V	30V	10UV/C	90MW		80dB	80dB	
OP-01GY	PRU	HSR	INT		5V/US	+20V	-20V	125C	88dB	5MV	100NA	20NA	500MWF	6MA	12V	15V	30V	10UV/C	90MW		80dB	80dB	
OP-01HJ	PRU	HSR	INT		5V/US	+22V	-22V	70C	94dB	0.7MV	30NA	2NA	500MWF	6MA	12V	15V	30V	5UV/C	60MW		90dB	90dB	
OP-01HP	OBS	HSR	INT		5V/US	+22V	-22V	70C	94dB	0.7MV	30NA	2NA	500MWF	6MA	12V	15V	30V	5UV/C	60MW		90dB	90dB	
OP-01HY	PRU	HSR	INT		5V/US	+22V	-22V	70C	94dB	0.7MV	30NA	2NA	500MWF	6MA	12V	15V	30V	5UV/C	60MW		90dB	90dB	
OP-01J	PRU	HSR	INT		5V/US	+22V	-22V	125C	94dB	0.7MV	30NA	2NA	500MWF	6MA	12V	15V	30V	5UV/C	60MW		90dB	90dB	
OP-01L	PRU	HSR	INT		5V/US	+22V	-22V	125C	94dB	0.7MV	30NA	2NA	500MWF	6MA	12V	15V	30V	5UV/C	60MW		90dB	90dB	
OP-01P	OBS	HSR	INT		5V/US	+22V	-22V	125C	94dB	0.7MV	30NA	2NA	500MWF	6MA	12V	15V	30V	5UV/C	60MW		90dB	90dB	
OP-01Y	PRU	HSR	INT		5V/US	+22V	-22V	125C	94dB	0.7MV	30NA	2NA	500MWF	6MA	12V	15V	30V	5UV/C	60MW		90dB	90dB	
OP-02AJ	PRU	LNA	INT	.8MHZ	.25V/US	+22V	-22V	125C	100dB	0.5MV	30NA	2NA	500MWF	6MA	12V	22V	30V	8UV/C	60MW		90dB	90dB	3.8M
OP-02AY	PRU	LNA	INT	.8MHZ	.25V/US	+22V	-22V	125C	100dB	0.5MV	30NA	2NA	500MWF	6MA	12V	22V	30V	8UV/C	60MW		90dB	90dB	3.8M
OP-02CJ	PRU	LNA	INT	.8MHZ	.25V/US	+22V	-22V	70C	94dB	2MV	50NA	5NA	500MWF	6MA	12V	22V	30V	10UV/C	90MW		90dB	90dB	2.3M
OP-02CY	PRU	LNA	INT	.8MHZ	.25V/US	+22V	-22V	70C	94dB	2MV	50NA	5NA	500MWF	6MA	12V	22V	30V	10UV/C	90MW		90dB	90dB	2.3M
OP-02EJ	PRU	LNA	INT	.8MHZ	.25V/US	+22V	-22V	70C	100dB	0.5MV	30NA	2NA	500MWF	6MA	12V	22V	30V	8UV/C	60MW		90dB	90dB	3.8M
OP-02EY	PRU	LNA	INT	.8MHZ	.25V/US	+22V	-22V	70C	100dB	0.5MV	30NA	2NA	500MWF	6MA	12V	22V	30V	8UV/C	60MW		90dB	90dB	3.8M
OP-02J	PRU	LNA	INT	.8MHZ	.25V/US	+22V	-22V	125C	94dB	2MV	50NA	5NA	500MWF	6MA	12V	22V	30V	10UV/C	90MW		90dB	90dB	2.3M
OP-02Y	PRU	LNA	INT	.8MHZ	.25V/US	+22V	-22V	125C	94dB	2MV	50NA	5NA	500MWF	6MA	12V	22V	30V	10UV/C	90MW		90dB	90dB	2.3M
OP-05AJ	PRU	PIA	INT	.3MHZ	0.1V/US	+22V	-22V	125C	110dB	1.5MV	2NA	2NA	500MWF	10MA	12V	22V	30V	0.9UV/C	120MW		114dB	100dB	30M
OP-05AL	PRU	PIA	INT	.3MHZ	0.1V/US	+22V	-22V	125C	110dB	1.5MV	2NA	2NA	500MWF	10MA	12V	22V	30V	0.9UV/C	120MW		114dB	100dB	30M
OP-05AY	PRU	PIA	INT	.3MHZ	0.1V/US	+22V	-22V	125C	110dB	1.5MV	2NA	2NA	500MWF	10MA	12V	22V	30V	0.9UV/C	120MW		114dB	100dB	30M
OP-05CJ	PRU	PIA	INT	.3MHZ	0.1V/US	+22V	-22V	70C	100dB	1.3MV	7NA	6NA	500MWF	10MA	12V	22V	30V	4.5UV/C	150MW		100dB	90dB	8M
OP-05CY	PRU	PIA	INT	.3MHZ	0.1V/US	+22V	-22V	70C	100dB	1.3MV	7NA	6NA	500MWF	10MA	12V	22V	30V	4.5UV/C	150MW		100dB	90dB	8M
OP-05EJ	PRU	PIA	INT	.3MHZ	0.1V/US	+22V	-22V	70C	106dB	0.5MV	4NA	3.8NA	500MWF	10MA	12V	22V	30V	2UV/C	120MW		110dB	94dB	15M
OP-05EY	PRU	PIA	INT	.3MHZ	0.1V/US	+22V	-22V	70C	106dB	0.5MV	4NA	3.8NA	500MWF	10MA	12V	22V	30V	2UV/C	120MW		110dB	94dB	15M
OP-05J	PRU	PIA	INT	.3MHZ	0.1V/US	+22V	-22V	125C	106dB	0.5MV	3NA	2.8NA	500MWF	10MA	12V	22V	30V	2UV/C	120MW		114dB	100dB	20M
OP-05L	PRU	PIA	INT	.3MHZ	0.1V/US	+22V	-22V	125C	106dB	0.5MV	3NA	2.8NA	500MWF	10MA	12V	22V	30V	2UV/C	120MW		114dB	100dB	20M
OP-05Y	PRU	PIA	INT	.3MHZ																			

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)

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

GBP = gain bandwidth product

$I_{b1}$  = input bias current

$I_{b2}$  = input bias offset current

$I_{Q}$  = quiescent supply current

MFR = manufacturer (codes at App.C.1)

$P_{Q1}$  = quiescent power consumer

PSRR = power supply rejection ratio

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

$V_{IDR}$  = 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

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 SUBSTITUTION	USA SUBSTITUTION	IS	TYPE NUMBER	
DIL-8/1P	T	E-	E+	V-	T*	R	V+	N	.	.	.	.	.	.	.	.	.	NE535V	0	NE535N(8)	
T05-8/1M	T	E-	E+	V-	T*	R	V+	N	.	.	.	.	.	.	.	.	.	SE535T	0	SE535T	
QIL-8/1P	T	E-	E+	V-	T*	R	V+	N	.	.	.	.	.	.	.	.	.	SE535V	0	NE535V	
T05-8/1M	T	E-	E+	V-	T*	R	V+	N	.	.	.	.	.	.	.	.	UA740HM	SU536T	0	NE536T	
T05-10/1M	B	E+	N	E-	B*	V-	L	Q	K	V+	.	.	.	.	.	.	.	SE540L	0	NE540L	
DIL-14/1P	E+	N	A2	A*2	V-	N	R	R*	N	V+	A1	A*1	N	E-	.	.	SN72733J	UA733DC	0	NE592A	
DIL-14/1C	E+	N	A2	A*2	V-	N	R	R*	N	V+	A1	A*1	N	E-	.	.	SN72733J	UA733DC	0	NE592F	
T05-10/1M	E+	E+	A2	A*2	V-	R	R*	V+	A1	A*1	.	.	.	.	.	.	SN72733L	UA733HC	0	NE592K	
DIL-14/1P	E+	N	A2	A*2	V-	N	R	R*	N	V+	A1	A*1	N	E-	.	.	SN72733J	UA733DC	0	NE592N(14)	
T05-10/1M	F	E+	V-	E-	∅	B	B*	R	V+	F*	.	.	.	.	.	.	.	LH0001CH	0	NH000CH	
T05-10/1M	F	E+	V-	E-	∅	B	B*	R	V+	F*	.	.	.	.	.	.	.	LH0001H	0	NH0001H	
T05-10/1M	F	E+	V-	E-	F*	N	G	R	V+	∅S	.	.	.	.	.	.	.	LH0003CH	0	NH0003CH	
T05-10/1M	F	E+	V-	E-	F*	N	G	R	V+	∅S	.	.	.	.	.	.	.	LH0003H	0	NH0003H	
T05-10/1M	F	E+	V-	E-	F*	B	B*	R	V+	∅S	.	.	.	.	.	.	.	LH0004CH	0	NH0004CH	
T05-10/1M	F	E+	V-	E-	F*	B	B*	R	V+	∅S	.	.	.	.	.	.	.	LH0004H	0	NH0004H	
T05-10/1M	E+	V+	V-	F	N	G	R	V-	∅	F*	.	.	.	.	.	.	.	LH0005AH	0	NH0005AH	
T05-10/1M	E+	V+	V-	F	N	G	R	V-	∅	F*	.	.	.	.	.	.	.	LH0005CH	0	NH0005CH	
T05-10/1M	E+	V+	V-	F	N	G	R	V-	∅	F*	.	.	.	.	.	.	.	LH0005H	0	NH0005H	
T05-8/1M	T	E-	E+	V-M	T*	R	V+	N	N	.	.	.	.	.	.	.	.	OP-01GJ	0	OP-01CJ	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-01CY	0	OP-01CP	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-01GY	0	OP-01CY	
T05-8/1M	T	E-	E+	V-M	T*	R	V+	N	N	.	.	.	.	.	.	.	.	OP-01FJ	0	OP-01EJ	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-01EY	0	OP-01EP	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-01FY	0	OP-01EY	
T05-8/1M	T	E-	E+	V-M	T*	R	V+	N	N	.	.	.	.	.	.	.	.	OP-01J	0	OP-01FJ	
FLP-10/3G	N	T	E-	E+	V-	T	R	V+	N	N	.	.	.	.	.	.	.	OP-01L	0	OP-01FL	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-01FY	0	OP-01FP	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-01Y	0	OP-01FY	
T05-8/1M	T	E-	E+	V-M	T*	R	V+	N	N	.	.	.	.	.	.	.	.	OP-01FJ	0	OP-01GJ	
FLP-10/3C	N	T	E-	E+	V-	T	R	V+	N	N	.	.	.	.	.	.	.	OP-01FL	0	OP-01GL	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-01GY	0	OP-01GP	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-01FY	0	OP-01GY	
T05-8/1M	T	E-	E+	V-M	T*	R	V+	N	N	.	.	.	.	.	.	.	.	OP-01J	0	OP-01HJ	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-01HY	0	OP-01HP	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-01Y	0	OP-01HY	
T05-8/1M	T	E-	E+	V-M	T*	R	V+	N	N	.	.	.	.	.	.	.	.	MONO-OP01J	0	OP-01J	
FLP-10/3C	N	T	E-	E+	V-	T	R	V+	N	N	.	.	.	.	.	.	.	MONO-OP01L	0	OP-01L	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-01Y	0	OP-01P	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	MONO-OP01Y	0	OP-01Y	
T05-8/1M	T	E-	E+	V-M	T*	R	V+	N	N	.	.	.	.	.	.	.	.	.	0	OP-02AJ	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	.	0	OP-02AY	
T05-8/1M	T	E-	E+	V-M	T*	R	V+	N	N	.	.	.	.	.	.	.	.	OP-02J	0	OP-02CJ	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-02Y	0	OP-02CY	
T05-8/1M	T	E-	E+	V-M	T*	R	V+	N	N	.	.	.	.	.	.	.	.	OP-02AJ	0	OP-02EJ	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-02AY	0	OP-02EY	
T05-8/1M	T	E-	E+	V-M	T*	R	V+	N	N	.	.	.	.	.	.	.	.	OP-02AJ	0	OP-02J	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	T*	R	V+	N	N	N	.	.	.	OP-02AY	0	OP-02Y	
T05-8/1M	T	E-	E+	V-M	N	R	V+	T*	.	.	.	.	.	.	.	.	.	.	0	OP-05AJ	
FLP-10/3C	N	T	E-	E+	V-	N	R	V+	T*	N	.	.	.	.	.	.	.	.	0	OP-05AL	
DIL-14/1C	N	N	T	E-	E+	V-	N	N	N	R	V+	T*	N	N	.	.	.	.	0	OP-05AY	
T05-8/1M	T	E-	E+	V-M	N	R	V+	T*	.	.	.	.	.	.	.	.	.	.	.	0	OP-05AJ
DIL-14/1C	N	N	T	E-	E+	V-	N	N	N	R	V+	T*	N	N	.	.	.	.	.	0	OP-05AL
T05-8/1M	T	E-	E+	V-M	N	R	V+	T*	.	.	.	.	.	.	.	.	.	.	.	0	OP-05AL
DIL-14/1C	N	N	T	E-	E+	V-	N	N	N	R	V+	T*	N	N	.	.	.	.	.	0	OP-05Y
T05-8/1M	T	E-	E+	V-M	N	R	V+	T*	.	.	.	.	.	.	.	.	.	.	.	0	OP-07AJ
DIL-14/1C	N	N	T	E-	E+	V-	N	N	N	R	V+	T*	N	N	.	.	.	.	.	0	OP-07AY
T05-8/1M	T	E-	E+	V-M	N	R	V+	T*	.	.	.	.	.	.	.	.	.	.	.	0	OP-07EJ

# 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

### 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

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

EURO SUBSTITUTION = PROELECTRON STANDARD OR OTHER TYPE AVAILABLE IN EUROPE

TYPE No. REPEATED ON R.H. MARGIN

ISS = ISSUE NUMBER OF DATA ENTRY

USA SUBSTITUTION = SUGGESTED ALTERNATIVE AVAILABLE IN USA.

# 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

