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Status	Product Specification
FAST Products	

FAST 74F157, 74F157A 74F158, 74F158A Data Selectors/Multiplexers

74F157/157A Quad 2-Input Data Selector/ Multiplexer, Non-Inverting
74F158/158A Quad 2-Input Data Selector/Multiplexer, Inverting

DESCRIPTION

The 74F157/74F157A is a high speed Quad 2-input multiplexer which selects 4 bits of data from one of two sources under the control of a common Select input (S). The Enable input ($\bar{E}$) is active when Low. When $\bar{E}$ is High, all of the outputs (Y_n) are forced Low regardless of all other input conditions.

Moving data from two registers to a common output bus is a common use of the 'F157/157A. The state of the Select input determines the particular register from which the data comes.

The device is the logic implementation of a 4-pole, 2-position switch where the position of the switch is determined by the logic levels supplied to the Select input.

The 74F158/74F158A is similar but has inverting outputs ($\bar{Y}_n$).

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F157	4.6ns	15mA
74F158	3.7ns	10mA
74F157A	4.6ns	15mA
74F158A	3.7ns	10mA

ORDERING INFORMATION

PACKAGES	COMMERCIAL RANGE $V_{CC} = 5V \pm 10\%$; $T_A = 0^\circ C$ to $+70^\circ C$
16-pin Plastic DIP	N74F157N, N74F157AN, N74F158N, N74F158AN
16-pin Plastic SO	N74F157D, N74F157AD, N74F158D, N74F158AD

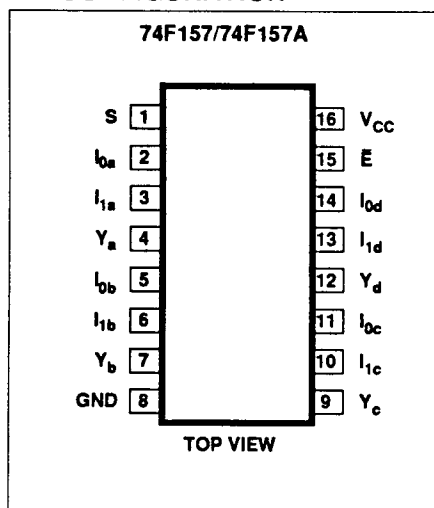
INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	74F(U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
$I_{1a}, I_{1b}, I_{1c}, I_{1d}$	Data inputs	1.0/1.0	20 μ A/0.6mA
S	Select input	1.0/1.0	20 μ A/0.6mA
$\bar{E}$	Enable input	1.0/1.0	20 μ A/0.6mA
$Y_a - Y_d$	Data outputs ('F157/'F157A)	50/33	1.0mA/20mA
$\bar{Y}_a - \bar{Y}_d$	Data outputs ('F158/'F158A)	50/33	1.0mA/20mA

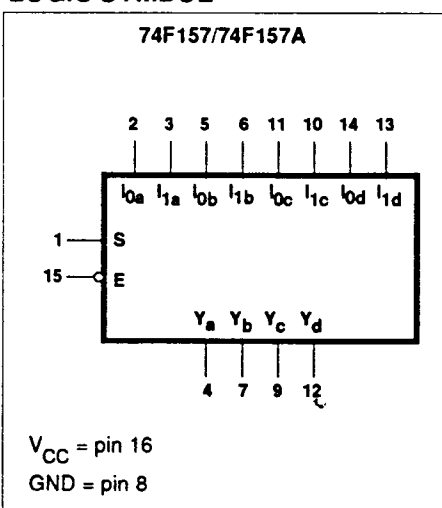
NOTE:

One (1.0) FAST Unit Load is defined as: 20 μ A in the High state and 0.6mA in the Low state.

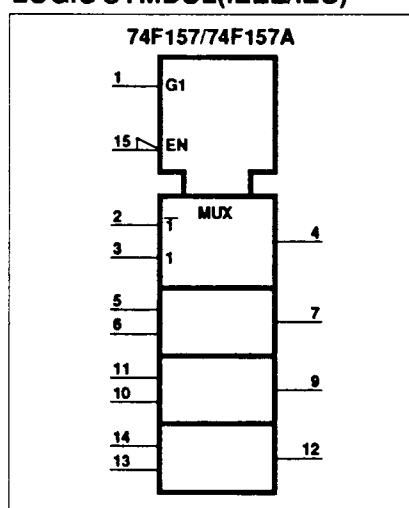
PIN CONFIGURATION



LOGIC SYMBOL



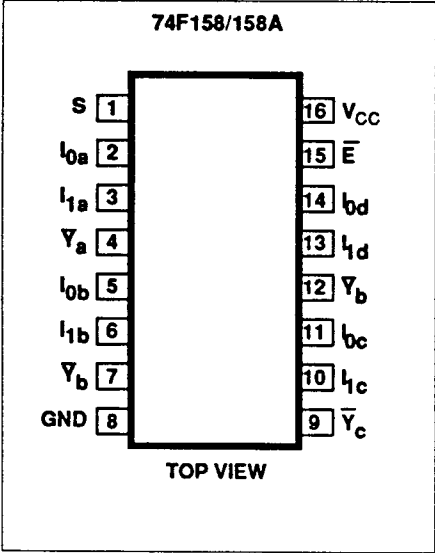
LOGIC SYMBOL(IEEE/IEC)



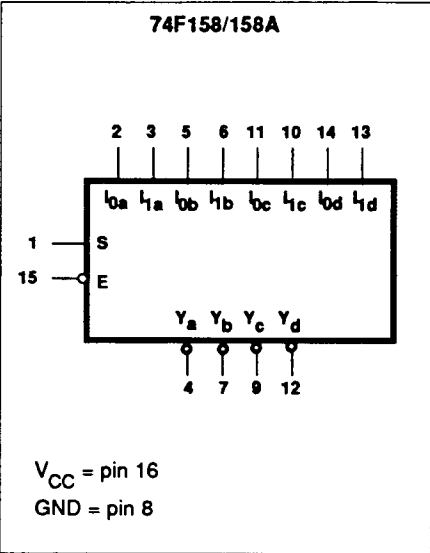
Data Selectors/Multiplexers

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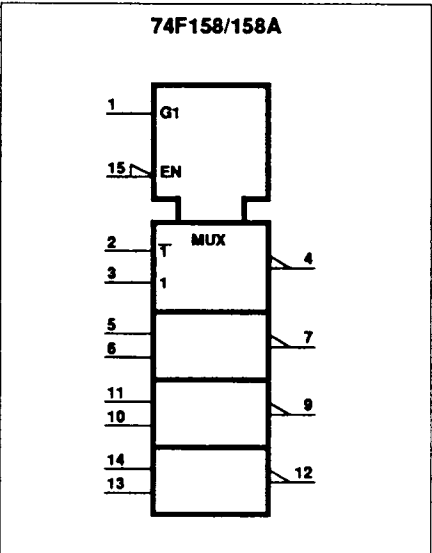
PIN CONFIGURATION



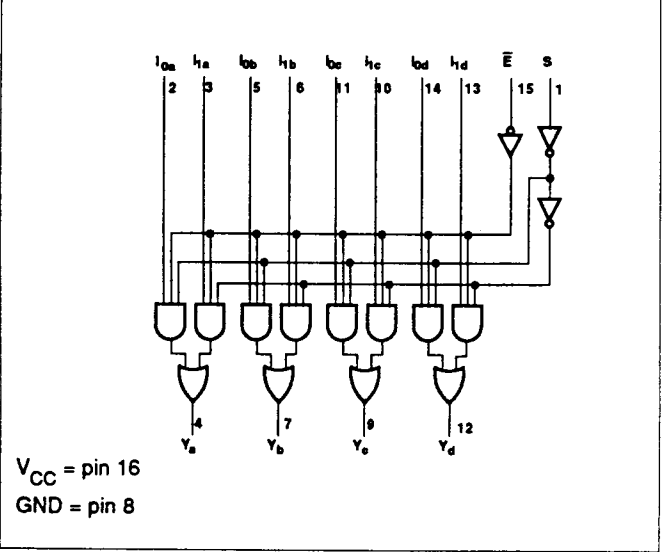
LOGIC SYMBOL



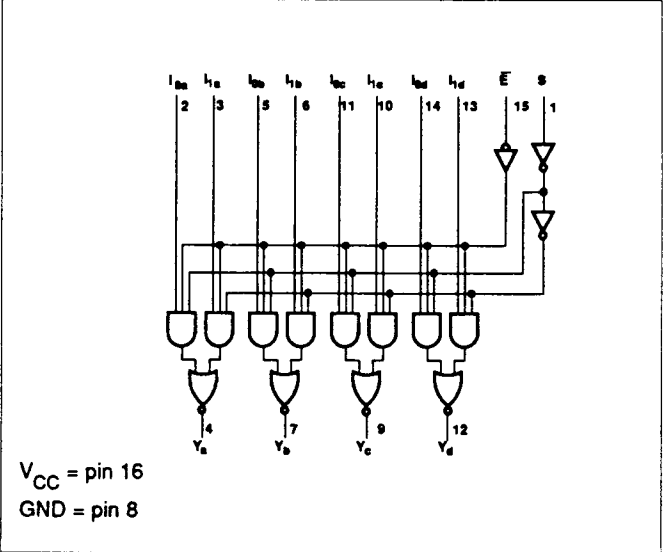
LOGIC SYMBOL(IEEE/IEC)



LOGIC DIAGRAM, 74F157/157A



LOGIC DIAGRAM, 74F158/158A



FUNCTION TABLE, 74F157/157A

INPUTS				OUTPUT
$\bar{E}$	S	I_{0n}	I_{1n}	Y_n
H	X	X	X	L
L	H	X	L	L
L	H	X	H	H
L	L	L	X	L
L	L	H	X	H

H = High voltage level
L = Low voltage level
X = Don't care

FUNCTION TABLE, 74F158/158A

INPUTS				OUTPUT
$\bar{E}$	S	I_{0n}	I_{1n}	$\bar{Y}_n$
H	X	X	X	H
L	L	L	X	H
L	L	H	X	L
L	H	X	L	H
L	H	X	H	L

H = High voltage level
L = Low voltage level
X = Don't care

Data Selectors/Multiplexers

FAST 74F157, 74F157A, 74F158, 74F158A

ABSOLUTE MAXIMUM RATINGS (Operation beyond the limits set forth in this table may impair the useful life of the device. Unless otherwise noted these limits are over the operating free-air temperature range.)

SYMBOL	PARAMETER	RATING	UNIT
V_{CC}	Supply voltage	-0.5 to +7.0	V
V_{IN}	Input voltage	-0.5 to +7.0	V
I_{IN}	Input current	-30 to +5	mA
V_{OUT}	Voltage applied to output in High output state	-0.5 to $+V_{CC}$	V
I_{OUT}	Current applied to output in Low output state	40	mA
T_A	Operating free-air temperature range	0 to +70	°C
T_{STG}	Storage temperature	-65 to +150	°C

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	LIMITS			UNIT
		Min	Nom	Max	
V_{CC}	Supply voltage	4.5	5.0	5.5	V
V_{IH}	High-level input voltage	2.0			V
V_{IL}	Low-level input voltage			0.8	V
I_{IK}	Input clamp current			-18	mA
I_{OH}	High-level output current			-1	mA
I_{OL}	Low-level output current			20	mA
T_A	Operating free-air temperature range	0		70	°C

DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

SYMBOL	PARAMETER		TEST CONDITIONS ¹		LIMITS			UNIT
					Min	Typ ²	Max	
V _{OH}	High-level output voltage		V _{CC} = MIN, V _{IL} = MAX	±10%V _{CC}	2.5			V
			V _{IH} = MIN, I _{OH} = MAX	±5%V _{CC}	2.7	3.4		V
V _{OL}	Low-level output voltage		V _{CC} = MIN, V _{IL} = MAX	±10%V _{CC}		0.30	0.50	V
			V _{IH} = MIN, I _{OL} = MAX	±5%V _{CC}		0.30	0.50	V
V _{IK}	Input clamp voltage		V _{CC} = MIN, I _I = I _{IK}			-0.73	-1.2	V
I _I	Input current at maximum input voltage		V _{CC} = MAX, V _I = 7.0V				100	μA
I _{IH}	High-level input current		V _{CC} = MAX, V _I = 2.7V				20	μA
I _{IL}	Low-level input current		V _{CC} = MAX, V _I = 0.5V				-0.6	mA
I _{OS}	Short circuit output current ³		V _{CC} = MAX		-60		-150	mA
I _{CC}	Supply current ⁴ (total)	'F157/157A	V _{CC} = MAX			15.0	23.0	mA
		'F158/158A				14.0	19.0	mA

NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
- All typical values are at $V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$.
- Not more than one output should be shorted at a time. For testing I_{OS} , the use of high-speed test apparatus and/or sample-and-hold techniques are preferable in order to minimize internal heating and more accurately reflect operational values. Otherwise, prolonged shorting of a High output may raise the chip temperature well above normal and thereby cause invalid readings in other parameter tests. In any sequence of parameter tests, I_{OS} tests should be performed last.
- I_{CC} is measured with 4.5V applied to all inputs and all outputs open.

Data Selectors/Multiplexers

FAST 74F157, 74F157A, 74F158, 74F158A

AC ELECTRICAL CHARACTERISTICS for 74F157 and 74F158

SYMBOL	PARAMETER		TEST CONDITION	LIMITS					UNIT
				$T_A = +25^{\circ}\text{C}$ $V_{CC} = 5\text{V}$ $C_L = 50\text{pF}$ $R_L = 500\Omega$			$T_A = 0^{\circ}\text{C to } +70^{\circ}\text{C}$ $V_{CC} = 5\text{V} \pm 10\%$ $C_L = 50\text{pF}$ $R_L = 500\Omega$		
				Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation delay I_{0n}, I_{1n} to Y_n	74F157	Waveform 1	3.5 2.5	4.5 3.5	7.0 5.5	3.0 1.5	8.0 7.0	ns
t_{PLH} t_{PHL}	Propagation delay $\bar{E}$ to Y_n		Waveform 3	5.0 3.8	7.5 5.0	10.0 7.0	5.0 3.8	11.5 8.0	ns
t_{PLH} t_{PHL}	Propagation delay S to Y_n		Waveform 1	4.5 3.5	8.0 6.0	13.0 8.0	4.5 3.5	15.0 9.0	ns
t_{PLH} t_{PHL}	Propagation delay I_{0n}, I_{1n} to $\bar{Y}_n$	74F158	Waveform 2	3.0 1.5	4.0 2.5	5.9 4.5	2.5 1.0	7.0 5.5	ns
t_{PLH} t_{PHL}	Propagation delay $\bar{E}$ to $\bar{Y}_n$		Waveform 4	4.5 3.5	6.0 5.5	8.0 8.5	4.0 3.5	9.0 9.5	ns
t_{PLH} t_{PHL}	Propagation delay S to $\bar{Y}_n$		Waveform 2	4.0 4.0	6.5 5.5	8.5 9.0	4.0 3.5	9.5 10.5	ns

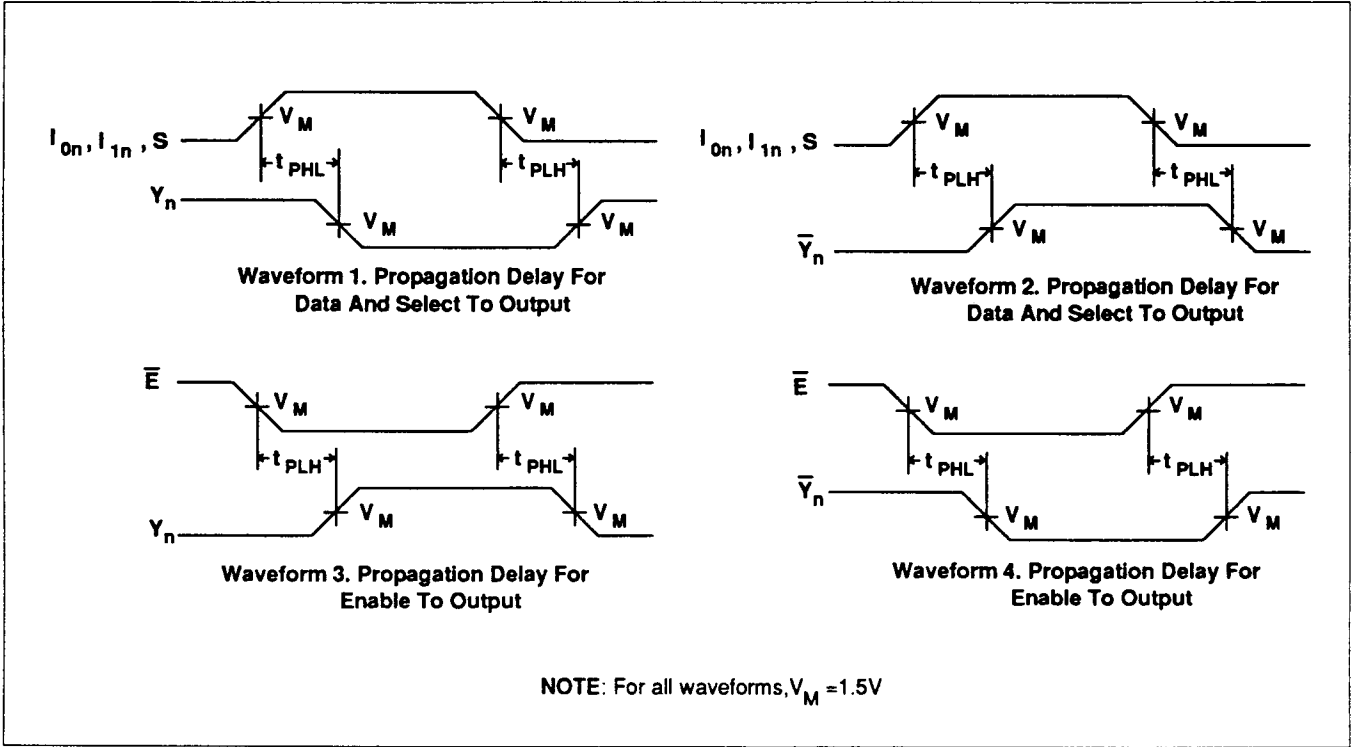
AC ELECTRICAL CHARACTERISTICS for 74F157A and 74F158A

SYMBOL	PARAMETER		TEST CONDITION	LIMITS					UNIT
				$T_A = +25^{\circ}\text{C}$ $V_{CC} = 5\text{V}$ $C_L = 50\text{pF}$ $R_L = 500\Omega$			$T_A = 0^{\circ}\text{C to } +70^{\circ}\text{C}$ $V_{CC} = 5\text{V} \pm 10\%$ $C_L = 50\text{pF}$ $R_L = 500\Omega$		
				Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation delay I_{0n}, I_{1n} to Y_n	74F157A	Waveform 1	3.5 2.5	4.5 3.5	6.5 5.0	3.0 1.5	7.0 6.0	ns
t_{PLH} t_{PHL}	Propagation delay $\bar{E}$ to Y_n		Waveform 3	6.0 4.0	7.5 5.0	9.0 6.5	5.5 4.0	10.5 7.0	ns
t_{PLH} t_{PHL}	Propagation delay S to Y_n		Waveform 1	5.5 4.5	7.5 6.0	10.0 7.5	5.0 4.0	11.0 8.5	ns
t_{PLH} t_{PHL}	Propagation delay I_{0n}, I_{1n} to $\bar{Y}_n$	74F158A	Waveform 2	3.0 1.5	4.0 2.5	6.0 4.0	2.5 1.0	7.0 4.5	ns
t_{PLH} t_{PHL}	Propagation delay $\bar{E}$ to $\bar{Y}_n$		Waveform 4	4.5 5.0	5.5 6.0	7.0 7.5	4.0 5.0	7.5 8.0	ns
t_{PLH} t_{PHL}	Propagation delay S to $\bar{Y}_n$		Waveform 2	4.5 4.0	6.5 5.5	8.5 7.5	4.0 3.5	9.5 8.0	ns

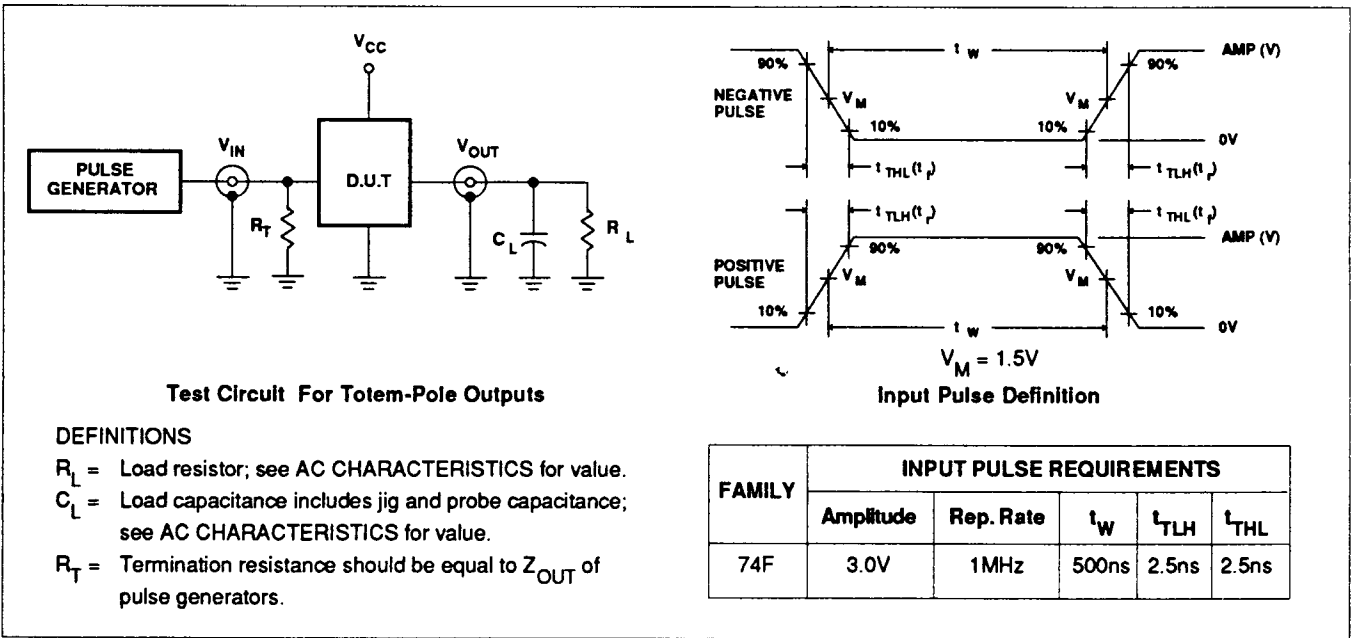
Data Selectors/Multiplexers

FAST 74F157, 74F157A, 74F158, 74F158A

AC WAVEFORMS



TEST CIRCUIT AND WAVEFORMS



VI. COMMERCIAL PRODUCT SPECIAL PROCESSING T-90-20

SUPR II LEVEL B PRICING ADDERS

SUPR II LEVEL B

Signetics Upgraded Product Reliability (SUPR) program is designed to provide customers whose systems require an infant mortality level less than that of our non-burned-in products (which is typically below 1000 PPM).

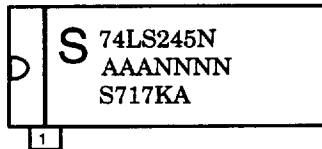
DEVICE AVAILABILITY

Products available for Level B processing are identified in the Price Book with a "B" suffix to the basic part number.

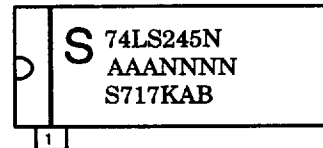
PRODUCT FAMILY	SUGGESTED RESALE ADDERS		
	1-99	100-999	OVER 1000
LIN	.14	.14	.11
LOG (TTL)			
(SSl)	.12	.10	.08
(MSl)	.16	.14	.11
(OCT)	.16	.14	.11
(CTM)	.16	.14	.11
LOG (ECL)			
(SSl)	.25	.23	.20
(MSl)	.25	.23	.20
LOG (LSI)	Consult Factory for Pricing		
(RAM)			
MIC (8X)			
PLD	Consult Factory for Pricing		
MCG	Consult Factory for Pricing		
DAT	Not Available		
MIC			

MARKING FORMAT EXAMPLES

Standard (no Burn-In) Products (Dual-in-line)



SUPR II (Burned-In) Products (Dual-in-line)



NOTE: The "B" in the 7th position on the 3rd line, when present, is the SUPR II Burn-In indicator.

TAPE AND REEL PACKAGING

SPECIFICATIONS

Tape and Reel specifications conform to Electronic Industries Association (EIA) Proposed Specification #EIA-481-A using 13 inch reels. Current incremental quantities reflect the quantities per reel. As more customers are able to handle a larger quantity per reel, this quantity will be increased.

DEVICE AVAILABILITY

Products available in tape and reel packaging are identified in the Price Book with a "T" suffix to the basic part number and are only offered as a product for sale by the reel. Return of product is limited to full reels with unbroken quality seals.

TAPE AND REEL PRICING ADDERS

PRODUCT FAMILY	SUGGESTED RESALE ADDER
MCG	.07
LIN	.07
LOG	.07
DAT MIC	PACKAGE A28 = .20 A44 = .25 A52 = .30 A68 = .40 A84 = .45 D24 = .17

VII. PACKING QUANTITY INFORMATION

T-90-20

CERAMIC DUAL IN-LINE (CERDIP)

PACKAGE CODE	PIN COUNT	QUANTITIES	
		DEVICES PER TUBE	DEVICES PER BOX
F/FE, BPA, PA	8-pin (300-mil)	48	1920
F, BCA, CA	14-pin (300-mil)	25	1000
F, BEA, EA	16-pin (300-mil)	25	1000
F, BVA, MVA	18-pin (300-mil)	21	840
F/FA, BRA, RA	20-pin (300-mil)	20	800
F, BWA, WA	22-pin (400-mil)	17	544
F/FA/F6, BJA, JA	24-pin (600-mil)	15	360
F/FA/F3/F24, BLA, LA	24-pin (300-mil)	15	600
F, BXA, XA	24-pin (400-mil)	15	480
F/FA/F28, BXA, XA	28-pin (600-mil)	13	312
FA	32-pin (600-mil)	11	264
F/FA/F40, BQA, MQA, QA	40-pin (600-mil)	9	216

CERPAC

PACKAGE CODE	PIN COUNT	QUANTITIES	
		DEVICES PER TUBE	
BDA/DA/W	14-pin	145	
BFA/FA/W	16-pin	145	
BXA/BYA/W	18-pin	100	
BSA/SA/W/WB	20-pin	100	
BKA/KA/W	24-pin	120	
BYA/YA/W	28-pin	50	

CERQUAD

PACKAGE CODE	PIN COUNT	QUANTITIES	
		DEVICES PER TRAY	DEVICES PER BOX
KA/K44	44-pin	6	6
KA/K68	68-pin	4	4
KA	84-pin	42	210

LEADLESS CHIP CARRIER

PACKAGE CODE	PIN COUNT	QUANTITIES	
		DEVICES PER TUBE	
B2A/2A/GA	20-pin	55	
B3A/3A/GA/GC1	28-pin	43	
YA/YA/GC2	32-pin	35	
BUA/MXA/MUA/UA/XA/GA/GC	44-pin	27	
BZA/BUA/UA/ZA/GA/GC	68-pin	19	

QUANTITIES SHOWN IN GRAY REQUIRE PURCHASE TO BE MADE IN EXACT MULTIPLES OF THAT QUANTITY.

VII. PACKING QUANTITY INFORMATION

T-90-20

PLASTIC DUAL IN-LINE

PACKAGE CODE	PIN COUNT	QUANTITIES	
		DEVICES PER TUBE	DEVICES PER BOX
N/N8	8-pin (300-mil)	50	2000
N/N14/N16	14- 16-pin (300-mil)	25	1000
N	18-pin (300-mil)	20	800
N/N20	20-pin (300-mil)	18	720
N	22-pin (400-mil)	17	544
N/N6	24-pin (600-mil)	15	360
N/N3/N24	24-pin (300-mil)	15	600
N/N24	24-pin (400-mil)	15	480
N/N28	28-pin (600-mil)	13	312
N/N3	28-pin (300-mil)	13	520
N	32-pin (600-mil)	11	264
N/N40	40-pin (600-mil)	9	216
NB (Shrink)	42-pin (600-mil)	12	288
N/N48	48-pin (600-mil)	7	168
N	50-pin (900-mil)	7	112
N/N64	64-pin (900-mil)	5	80

PLASTIC LEADED CHIP CARRIER (PLCC)

PACKAGE CODE	PIN COUNT	QUANTITIES		
		DEVICES PER TUBE	DEVICES PER BOX	DEVICES PER REEL
A	20-pin	46	3680	1000
A/A28	28-pin	37	2368	750
A	32-pin	31	2232	750
A/A44	44-pin	26	1248	500
A/A52	52-pin	23	1012	500
A/A68	68-pin	18	648	250
A/A84	84-pin	15	420	250

QUANTITIES SHOWN IN GRAY REQUIRE PURCHASE TO BE MADE IN EXACT MULTIPLES OF THAT QUANTITY.

VII. PACKING QUANTITY INFORMATION

T-90-20

PLASTIC SMALL OUTLINE (SO)

PACKAGE CODE	PIN COUNT	QUANTITIES		
		DEVICES PER TUBE	DEVICES PER BOX	DEVICES PER REEL
D/D8	8-pin (150-mil)	100	10000	2500
D	8-pin (300-mil)	64	2560	1000 - 13" 700 - 7"
D/D14	14-pin (150-mil)	57	5700	2500
D	16-pin (150-mil)	50	5000	2500
D	16-pin (300-mil)	48	1920	1000
DK(SSOP)	20-pin (170-mil)	75	6750	2500
D	20-pin (300-mil)	38	1520	1000
D/D24	24-pin (300-mil)	32	1280	1000
D	28-pin (300-mil)	27	1080	1000
D	40-pin (VSO-40)	31	1240	1000 - 13" 300 - 7"
D	56-pin (VSO-56)	22	616	1000

QUAD FLAT PACK*

PACKAGE CODE	PIN COUNT	QUANTITIES	
		DEVICES PER TRAY	DEVICES PER BOX
B/B44	44-pin	50	500
B/B44	44-pin	96	480
B	52-pin	119	595
B	80-pin	66	330
B	100-pin	50	250
B	120-pin	24	120
B	120-pin (Philips source)	30	150

- * Quad Flat Pack parts require dry pack handling according to EIA Standard - 583.
These parts are identified in part list section with DRY PACK in the Cross Ref Part No field.

QUANTITIES SHOWN IN GRAY REQUIRE PURCHASE TO BE MADE IN EXACT MULTIPLES OF THAT QUANTITY.