

MC10H643, MC100H643

Dual Supply ECL to TTL 1:8 Clock Driver

The MC10H/100H643 is a dual supply, low skew translating 1:8 clock driver. Devices in the ON Semiconductor H600 translator series utilize the PLCC-28 for optimal power pinning, signal flow through and electrical performance. The dual-supply H643 is similar to the H641, which is a single-supply 1:9 version of the same function.

The device features a 48 mA TTL output stage, with AC performance specified into a 50 pF load capacitance. A Latch is provided on-chip. When LEN is LOW (or left open, in which case it is pulled LOW by the internal pulldowns) the latch is transparent. A HIGH on the enable pin ($\overline{\text{EN}}$) forces all outputs LOW.

The 10H version is compatible with MECL™ 10H ECL logic levels. The 100H version is compatible with 100K levels.

- ECL/TTL Version of Popular ECLinPS™ E111
- Low Skew Within Device 0.5 ns
- Guaranteed Skew Spec Part-to-Part 1.0 ns
- Latch
- Differential Internal Design
- V_{BB} Output
- Dual Supply
- Reset/Enable
- Multiple TTL and ECL Power/Ground Pins

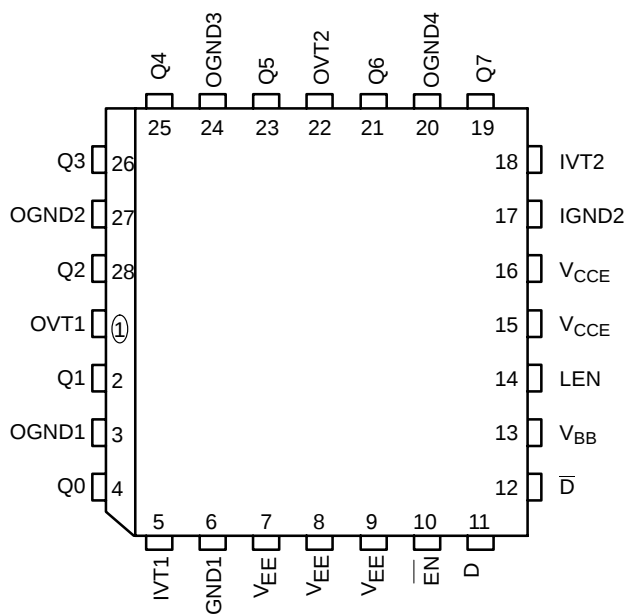
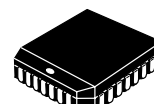


Figure 1. Pinout: PLCC-28
(Top View)



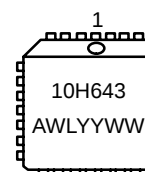
ON Semiconductor®

<http://onsemi.com>



PLCC-28
FN SUFFIX
CASE 776

MARKING DIAGRAM



A = Assembly Location
WL = Wafer Lot
YY = Year
WW = Work Week

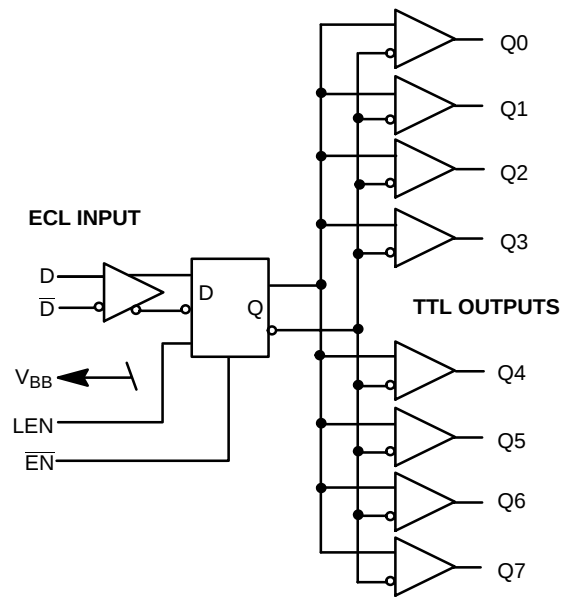
PIN NAMES

PIN	FUNCTION
OGND	TTL Output Ground (0V)
OVT	TTL Output V_{CC} (+5.0V)
IGND	Internal TTL GND (0V)
IVT	Internal TTL V_{CC} (+5.0V)
V_{EE}	ECL V_{EE} (-5.2/-4.5V)
V_{CCE}	ECL Ground (0V)
D, $\overline{\text{D}}$	Signal Input (ECL)
V_{BB}	V_{BB} Reference Output
Q0-Q7	Signal Outputs (TTL)
$\overline{\text{EN}}$	Enable Input (ECL)
LEN	Latch Enable Input (ECL)

ORDERING INFORMATION

Device	Package	Shipping
MC10H643FN	PLCC-28	37 Units/Rail
MC100H643FN	PLCC-28	37 Units/Rail

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TRUTH TABLE

D	LEN	EN	Q
L	L	L	L
H	L	L	H
X	H	L	Q ₀
X	X	H	L

Figure 2. Logic Diagram

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DC CHARACTERISTICS (IVT = OVT = 5.0 V $\pm 5\%$; $V_{EE} = -5.2$ V $\pm 5\%$ (10H Version); $V_{EE} = -4.2$ V to -5.5 V (100H Version))

Symbol	Characteristic		Condition	0°C		25°C		85°C		Unit
				Min	Max	Min	Max	Min	Max	
I_{EE}	Power Supply Current	ECL	V_{EE} Pins	–	42	–	42	–	42	mA
I_{CCL}		TTL	Total all OVT and IVT pins	–	106	–	106	–	106	mA
I_{CCH}				–	95	–	95	–	95	mA

10H ECL DC CHARACTERISTICS (IVT = OVT = 5.0 V $\pm 5\%$; $V_{EE} = -5.2$ V $\pm 5\%$ (10H Version))

Symbol	Characteristic	0°C		25°C		85°C		Unit
		Min	Max	Min	Max	Min	Max	
I_{INH} I_{INL}	Input HIGH Current Input LOW Current	– 0.5	255 –	– 0.5	175 –	– 0.5	175 –	μ A
V_{IH} V_{IL}	Input HIGH Voltage Input LOW Voltage	–1170 –1950	–840 –1480	–1130 –1950	–810 –1480	–1070 –1950	–735 –1450	mV
V_{BB}	Output Reference Voltage	–1380	–1270	–1350	–1250	–1310	–1190	mV

100H ECL DC CHARACTERISTICS (IVT = OVT = 5.0 V $\pm 5\%$; $V_{EE} = -4.2$ V to -5.5 V (100H))

Symbol	Characteristic	0°C		25°C		85°C		Unit
		Min	Max	Min	Max	Min	Max	
I_{INH} I_{INL}	Input HIGH Current Input LOW Current	– 0.5	255 –	– 0.5	175 –	– 0.5	175 –	μ A
V_{IH} V_{IL}	Input HIGH Voltage Input LOW Voltage	–1165 –1810	–880 –1475	–1165 –1810	–880 –1475	–1165 –1810	–880 –1475	mV
V_{BB}	Output Reference Voltage	–1380	–1260	–1380	–1260	–1380	–1260	mV

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DC TTL CHARACTERISTICS (IVT = OVT = 5.0 V $\pm 5\%$; $V_{EE} = -5.2$ V $\pm 5\%$ (10H Version); $V_{EE} = -4.2$ V to -5.5 V (100H Version))

Symbol	Characteristic	Condition	0°C		25°C		85°C		Unit
			Min	Max	Min	Max	Min	Max	
V_{OH}	Output HIGH Voltage	$I_{OH} = -3.0$ mA $I_{OH} = -15$ mA	2.5 2.0	– –	2.5 2.0	– –	2.5 2.0	– –	V
V_{OL}	Output LOW Voltage	$I_{OH} = 48$ mA	–	0.5	–	0.5	–	0.5	V
IOS	Output Short Circuit Current	$V_{OUT} = 0$ V	–100	–225	–100	–225	–100	–225	mA

AC CHARACTERISTICS (IVT = OVT = 5.0 V $\pm 5\%$; $V_{EE} = -5.2$ V $\pm 10\%$ (10H); -4.2 V to -5.5 V (100H); $V_{CCE} = GND$)

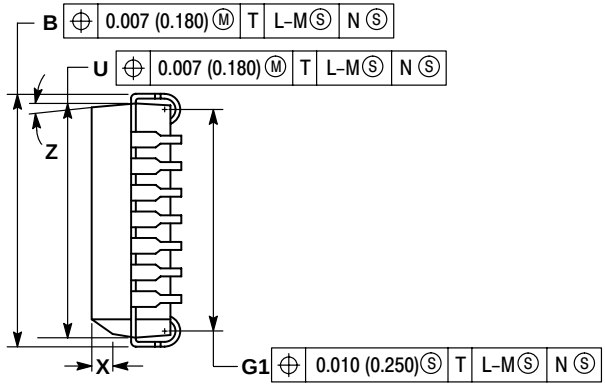
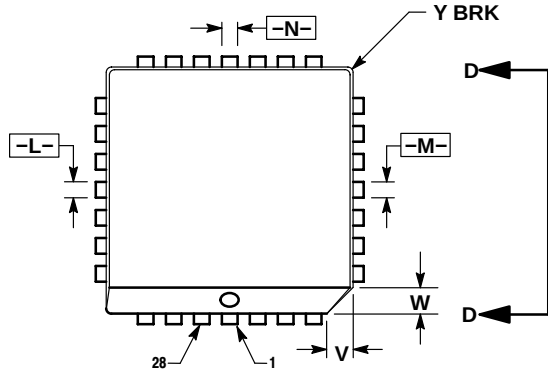
Symbol	Characteristic	Condition	0°C		25°C		85°C		Unit
			Min	Max	Min	Max	Min	Max	
t_{PLH}	Propagation Delay to Output D LEN EN	CL = 50 pF	4.0 3.5 3.5	5.0 5.5 5.5	4.1 3.5 3.5	5.1 5.5 5.5	4.4 3.9 3.9	5.4 5.9 5.9	ns
t_{SKEW}	Within-Device Skew	(Note 1)	–	0.5	–	0.5		0.5	ns
t_w	Pulse Width Out HIGH or LOW @ $f_{out} = 50$ MHz	CL = 50 pF (Note 2)	9.0	11.0	9.0	11.0	9.0	11.0	ns
t_s	Setup Time D		0.75	–	0.75	–	0.75	–	ns
t_h	Hold Time D		0.75	–	0.75	–	0.75	–	ns
t_{RR}	Recovery Time LEN EN		1.25 1.25	– –	1.25 1.25	– –	1.25 1.25	– –	ns
t_{pw}	Minimum Pulse Width LEN EN		1.5 1.5	– –	1.5 1.5	– –	1.5 1.5	– –	ns
t_r t_f	Rise / Fall Times 0.8 V – 2.0 V	CL = 50 pF	–	1.2	–	1.2	–	1.2	ns

1. Within-Device skew defined as identical transitions on similar paths through a device.
2. Pulse width is defined relative to 1.5 V measurement points on the output waveform.

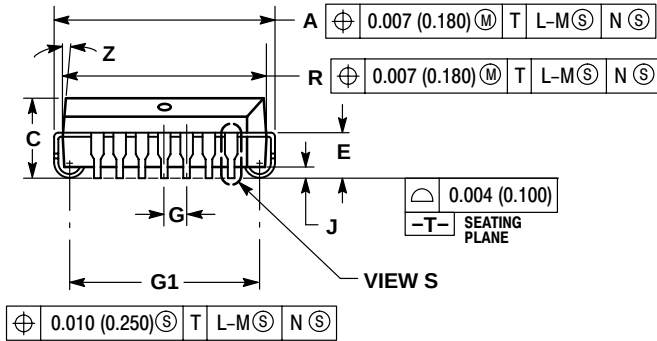
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PACKAGE DIMENSIONS

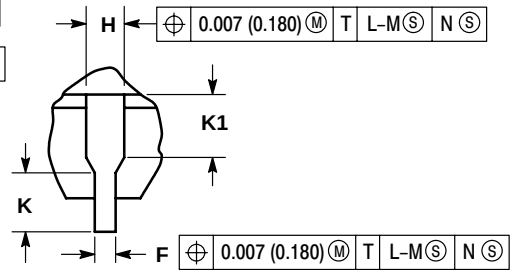
PLCC-28
FN SUFFIX
PLASTIC PLCC PACKAGE
CASE 776-02
ISSUE E



VIEW D-D



VIEW S



VIEW S

NOTES:

1. DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
2. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
3. DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
5. CONTROLLING DIMENSION: INCH.
6. THE PACKAGE TOP MAY BE SMALLER THAN THE PACKAGE BOTTOM BY UP TO 0.012 (0.300). DIMENSIONS R AND U ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.
7. DIMENSION H DOES NOT INCLUDE DAMBAR PROTRUSION OR INTRUSION. THE DAMBAR PROTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE GREATER THAN 0.037 (0.940). THE DAMBAR INTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE SMALLER THAN 0.025 (0.635).

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.485	0.495	12.32	12.57
B	0.485	0.495	12.32	12.57
C	0.165	0.180	4.20	4.57
E	0.090	0.110	2.29	2.79
F	0.013	0.019	0.33	0.48
G	0.050 BSC		1.27 BSC	
H	0.026	0.032	0.66	0.81
J	0.020	---	0.51	---
K	0.025	---	0.64	---
R	0.450	0.456	11.43	11.58
U	0.450	0.456	11.43	11.58
V	0.042	0.048	1.07	1.21
W	0.042	0.048	1.07	1.21
X	0.042	0.056	1.07	1.42
Y	---	0.020	---	0.50
Z	2°	10°	2°	10°
G1	0.410	0.430	10.42	10.92
K1	0.040	---	1.02	---

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