

MITSUBISHI (DIGITAL ASSP)
M66700P/WP

DUAL HIGH-SPEED CCD CLOCK DRIVER

DESCRIPTION

M66700 Semiconductor Integrated Circuit is built in facsimiles and photocopiers to drive CCD linear image sensor data transfer clocks at high speeds. Because this IC takes in data on the TTL (Transistor-transistor logic) level, it can be driven directly by a TTL integrated circuit.

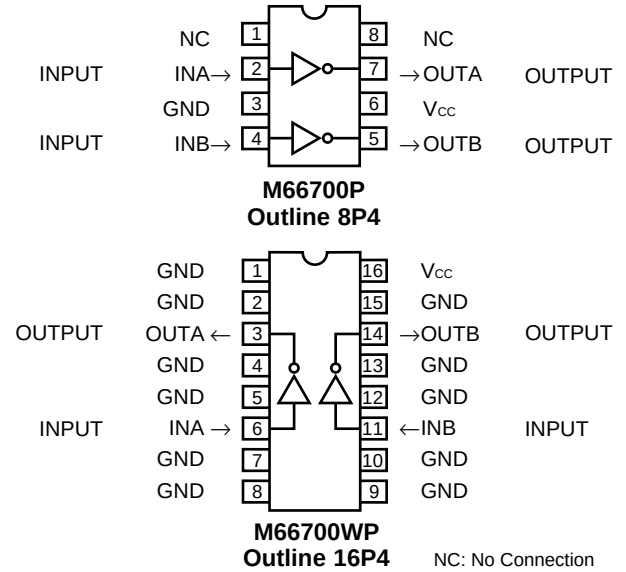
FEATURES

- Output logic amplitude: 12V
- High-speed rise/fall time
 $t_r = t_f = 33\text{ns}$ (typical)
 $C_L = 1000\text{pF}$
- High output "H" level voltage: ($V_{CC} - 1$) V minimum
- Low output "L" level voltage: 0.5V maximum
- TTL input level
- Package with improved allowable power dissipation (WP) characteristic

APPLICATION

Driving of CCD image sensors in facsimiles, image scanners and photocopiers

PIN CONFIGURATION (TOP VIEW)



ABSOLUTE MAXIMUM RATINGS (Ta = 0 ~ 70°C unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		-0.5 ~ +15	V
V_I	Input voltage		-0.5 ~ +15	V
V_O	Output voltage	Output: "H"	V_{CC}	V
P_d	Power dissipation	For single integrated circuit; Ta = 25°C (Note 1)	950 (P) /1800 (WP)	mW
T_{stg}	Storage temperature		-65 ~ 150	°C

Note 1: When Ta is 25°C or higher, conduct derating as follows: 7.7mW/°C (P) /14.4mW/°C (WP).

RECOMMENDED OPERATIONAL CONDITIONS

Symbol	Parameter	Limits			Unit
		Min.	Typ.	Max.	
V_{CC}	Supply voltage	10.8	12.0	13.2	V
V_{IH}	"H" input voltage	2.0			V
V_{IL}	"L" input voltage			0.8	V
T_{opr}	Operating temperature	0		70	°C

ELECTRICAL CHARACTERISTICS ($V_{CC} = 12\text{V} \pm 10\%$ and Ta = 0 ~ 70°C unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ. (Note 2)	Max.	
V_{IH}	"H" input voltage		2.0			V
V_{IL}	"L" input voltage				0.8	V
V_{IC}	Input clamp voltage	$I_{IC} = -18\text{mA}$		-0.82	-1.5	V
V_{OH}	"H" output voltage	$V_I = 0.4\text{V}$, $I_{OH} = -1\text{mA}$	$V_{CC} - 1$	11.3		V
V_{OL}	"L" output voltage	$V_I = 2.0\text{V}$, $I_{OL} = +1\text{mA}$		0.23	0.5	V
I_{IH}	"H" input current	$V_I = 5.5\text{V}$			100	μA
I_{IL}	"L" input current	$V_{CC} = 12\text{V}$, $V_I = 0.4\text{V}$		-0.13	-0.4	mA
$I_{CC H}$	"H" supply current	$V_{CC} = 12\text{V}$, $V_I = 0.0\text{V}$		2.2	5	mA
$I_{CC L}$	"L" supply current	$V_{CC} = 12\text{V}$, $V_I = 4.5\text{V}$		29.2	38	mA

Note 2: Standard values are measured under $V_{CC} = 12\text{V}$ and Ta = 25°C.

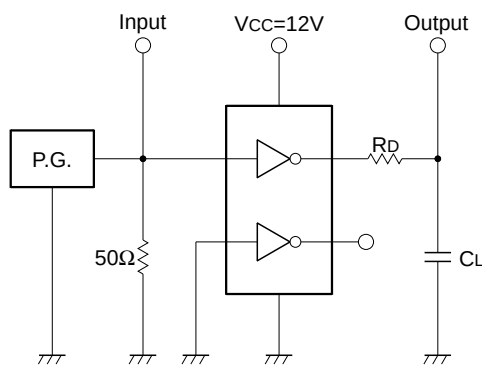
DUAL HIGH-SPEED CCD CLOCK DRIVER

SWITCHING CHARACTERISTICS ($V_{CC} = 12V$, $T_a = 25^\circ C$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
t_{on}	Turn-on time	$V_{CC} = 12V$ $R_D = 10\Omega$ (Note 3) $C_L = 1000pF$ See test circuit.		7	30	ns
t_{off}	Turn-off time			10	30	ns
t_r	Rise time			34	50	ns
t_f	Fall time			32	50	ns

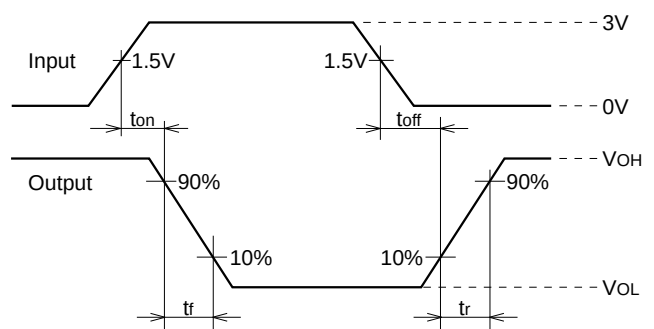
Note 3: When M66700 is activated at high speeds, overshoot or undershoot may occur. To prevent it, connect damping resistance R_D $10\Omega \sim 30\Omega$ to output.

TEST CIRCUIT



PG (pulse generator) output conditions are as follows:
 Rise time : $t_r \leq 6ns$
 Fall time : $t_f \leq 6ns$
 Repeat frequency: PRR = 1MHz
 Pulse width : $t_w = 500 ns$
 Pulse amplitude : $V_P = 3V_{P-P}$

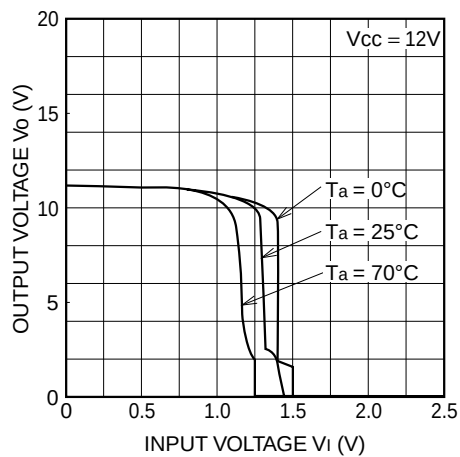
TIMING CHART



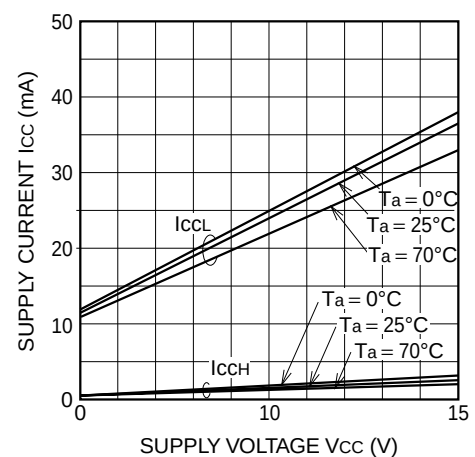
Input/Output Voltage Waveform

TYPICAL CHARACTERISTICS

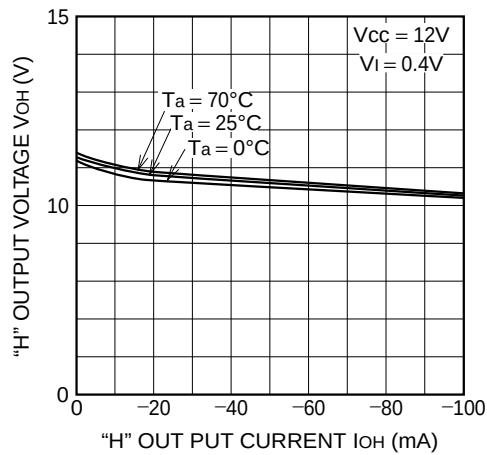
INPUT/OUTPUT PROPAGATION CHARACTERISTIC



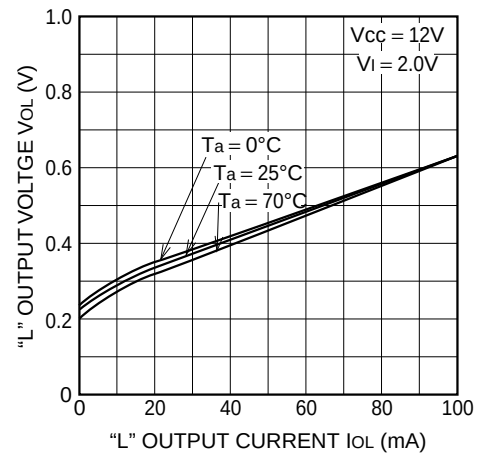
SUPPLY CURRENT VS SUPPLY VOLTAGE



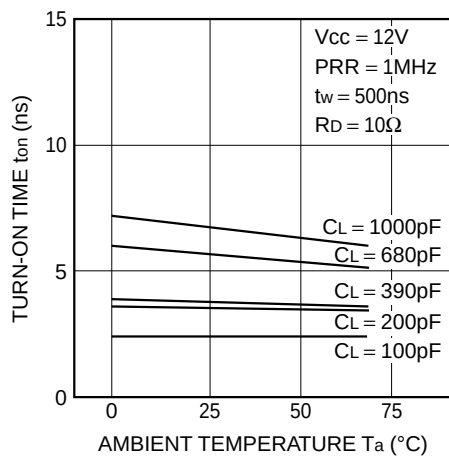
"H" OUTPUT VOLTAGE VS "H" OUTPUT CURRENT



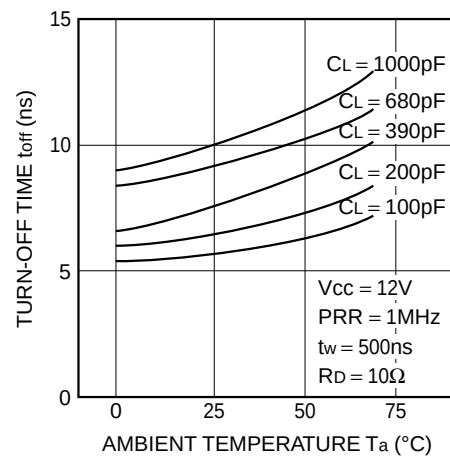
"L" OUTPUT VOLTAGE VS "L" OUTPUT CURRENT



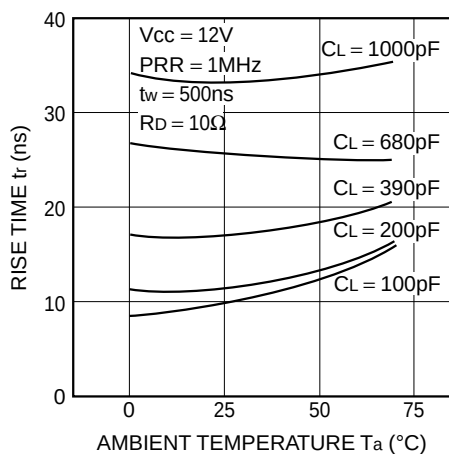
TURN-ON TIME VS AMBIENT TEMPERATURE



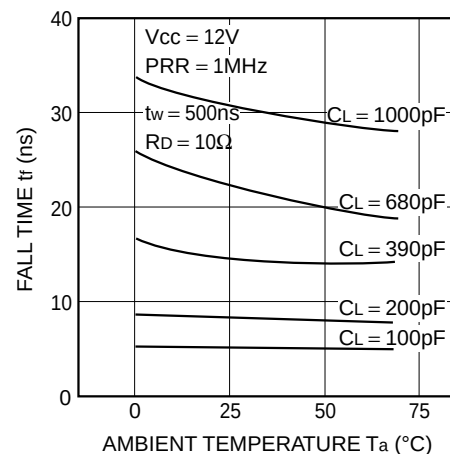
TURN-OFF TIME VS AMBIENT TEMPERATURE



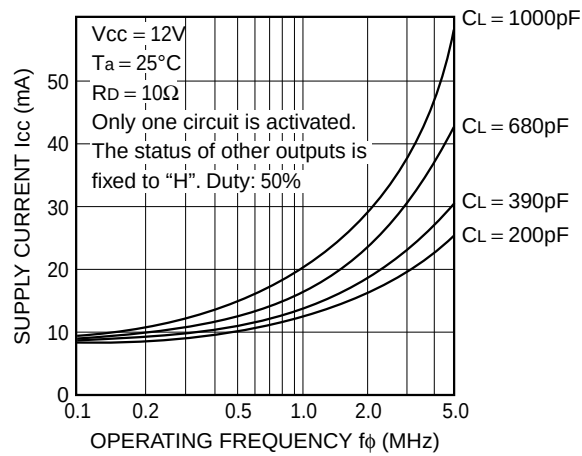
RISE TIME VS AMBIENT TEMPERATURE



FALL TIME VS AMBIENT TEMPERATURE



SUPPLY CURRENT VS OPERATING FREQUENCY



APPLICATION CIRCUIT EXAMPLE

