

M66705P/FP

QUADRUPLE HIGH-SPEED CCD CLOCK DRIVER

DESCRIPTION

The M66705P/FP is a semiconductor integrated circuit for high-speed driving of transfer clock of a CCD linear image sensor used for facsimiles or copying machines. TTL-level input enables direct drive in the IC of TTL system.

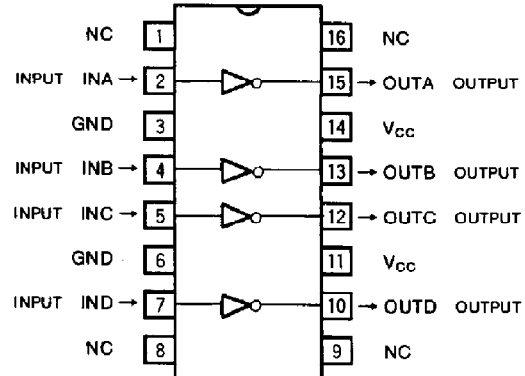
FEATURES

- Output amplitude12V
- High-speed rise/fall waveform
 $t_r=t_f=33\text{ns}$ (typ.) $C_L=1000\text{pF}$
- High output high-level voltage $(V_{CC}-1)\text{V}$ (min.)
- Low output low-level voltage0.5V (max.)
- Direct drive is possible by TTL-level input.

APPLICATION

CCD image sensor driving for facsimiles, image scanners and copying machines

PIN CONFIGURATION (TOP VIEW)



Outline 16P4 (P)
16P2N-A (FP)

NC : No Connection

ABSOLUTE MAXIMUM RATINGS ($T_a=0\sim70^\circ\text{C}$, unless otherwise noted.)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		$-0.5\sim+15$	V
V_i	Input voltage		$-0.5\sim+15$	V
V_o	Output voltage	When the output is high-level	V_{CC}	V
P_d	Power dissipation (Note 1)	DIP $T_a=25^\circ\text{C}$	1100	mW
		SOP $T_a=25^\circ\text{C}$	640	
T_{stg}	Storage temperature range		$-65\sim+150$	$^\circ\text{C}$

Note 1. Derating should be made according to the attached thermal derating characteristics at $T_a \geq 25^\circ\text{C}$.

RECOMMENDED OPERATING CONDITIONS ($T_a=0\sim70^\circ\text{C}$, unless otherwise noted.)

Symbol	Parameter	Limits			Unit
		Min.	Typ.	Max.	
V_{CC}	Supply voltage	10.8	12.0	13.2	V
V_{IH}	High-level input voltage	2.0			V
V_{IL}	Low-level input voltage			0.8	V
T_{opr}	Operating temperature range	0		70	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{CC}=12\text{V}\pm10\%$, $T_a=0\sim70^\circ\text{C}$, unless otherwise noted.)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ. (*)	Max.	
V_{IH}	High-level input voltage		2.0			V
V_{IL}	Low-level input voltage				0.8	V
V_{IC}	Input clamp voltage	$I_{IC}=-18\text{mA}$		-0.82	-1.5	V
V_{OH}	High-level output voltage	$V_i=0.4\text{V}$, $I_{OH}=-1\text{mA}$	$V_{CC}-1$	11.3		V
V_{OL}	Low-level output voltage	$V_i=2.0\text{V}$, $I_{OL}=+1\text{mA}$		0.23	0.5	V
I_{IH}	High-level input current	$V_i=5.5\text{V}$			100	μA
I_{IL}	Low-level input current	$V_{CC}=12\text{V}$, $V_i=0.4\text{V}$		-0.13	-0.4	mA
I_{OCH}	High-level supply current	$V_{CC}=12\text{V}$, $V_i=0.0\text{V}$		4.4	6	mA
I_{OCL}	Low-level supply current	$V_{CC}=12\text{V}$, $V_i=4.5\text{V}$		58.5	75	mA

(*) All typical values are at $V_{CC}=12\text{V}$, $T_a=25^\circ\text{C}$.

6249826 0020967 596

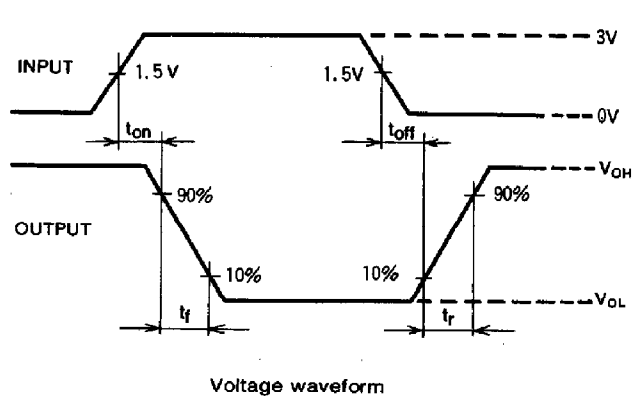
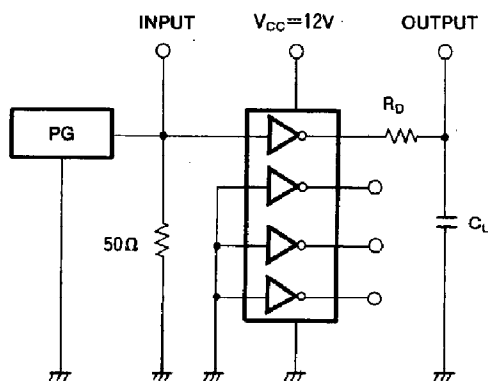


QUADRUPLE HIGH-SPEED CCD CLOCK DRIVER**SWITCHING CHARACTERISTICS** ($V_{CC}=12V$, $T_a=25^\circ C$, unless otherwise noted.)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ. (*)	Max.	
t_{on}	Turn-on time	$V_{CC}=12V$		7	30	ns
t_{off}	Turn-off time	$R_D=10\Omega$ (Note 2)		10	30	ns
t_r	Rise time	$C_L=1000pF$		34	50	ns
t_f	Fall time	See test diagram		32	50	ns

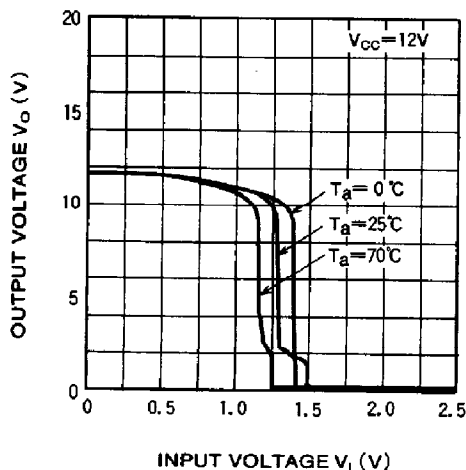
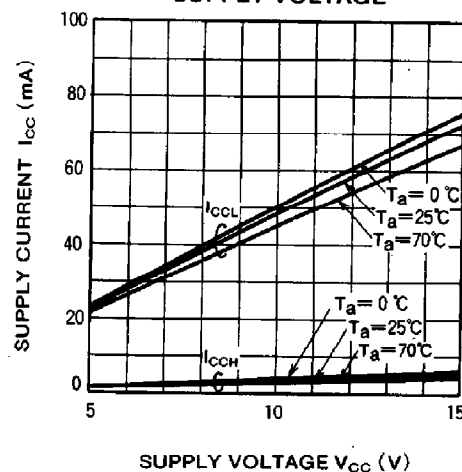
Note 2. If the M66705 is operated at high speed, overshooting or undershooting may occur. To reduce them, connect a dumping resistor of $R_D=10\sim30\Omega$ to the output.

(*) All typical values are at $V_{CC}=12V$, $T_a=25^\circ C$.

TEST CIRCUIT

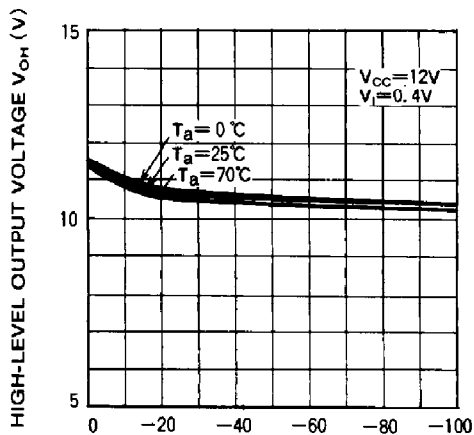
The output conditions of PG (pulse generator) are as follows:

Rise time	$t_r \leq 6ns$
Fall time	$t_f \leq 6ns$
Repetitive frequency	PRR=1MHz
Pulse width	$t_w=500ns$
Pulse amplitude	$V_p=3V_{p-p}$

TYPICAL CHARACTERISTICS**I/O TRANSMISSION CHARACTERISTICS****SUPPLY CURRENT VS SUPPLY VOLTAGE**

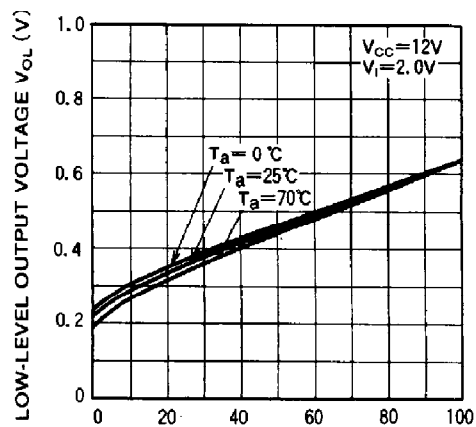
QUADRUPLE HIGH-SPEED CCD CLOCK DRIVER

HIGH-LEVEL OUTPUT VOLTAGE VS
HIGH-LEVEL OUTPUT CURRENT



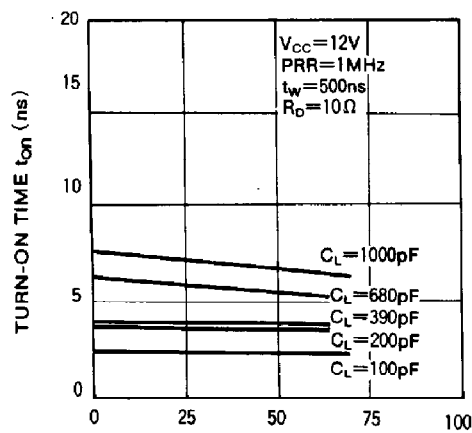
HIGH-LEVEL OUTPUT CURRENT I_{OH} (mA)

LOW-LEVEL OUTPUT VOLTAGE VS
LOW-LEVEL OUTPUT CURRENT



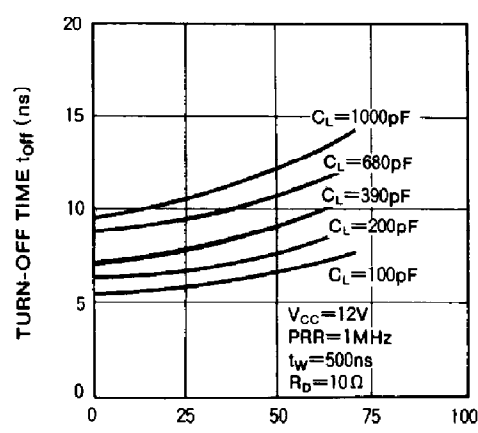
LOW-LEVEL OUTPUT CURRENT I_{OL} (mA)

TURN-ON TIME VS AMBIENT
TEMPERATURE



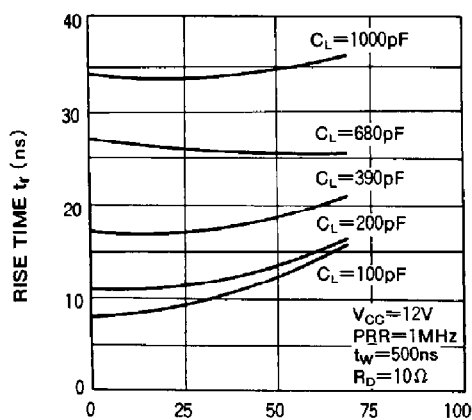
AMBIENT TEMPERATURE T_a ($^\circ\text{C}$)

TURN-OFF TIME VS AMBIENT
TEMPERATURE



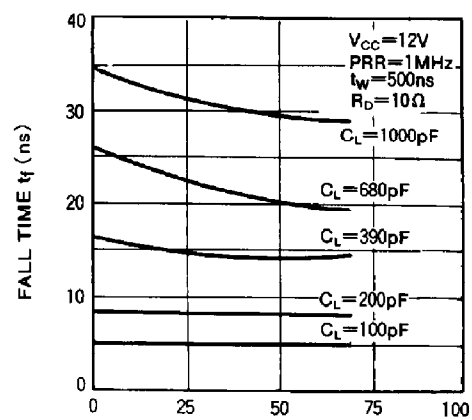
AMBIENT TEMPERATURE T_a ($^\circ\text{C}$)

RISE TIME VS AMBIENT
TEMPERATURE



AMBIENT TEMPERATURE T_a ($^\circ\text{C}$)

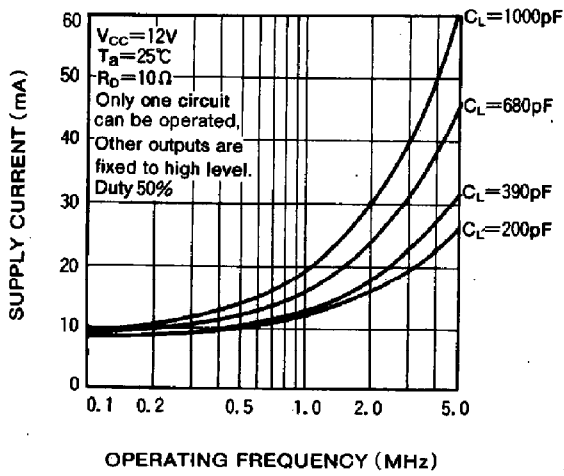
FALL TIME VS AMBIENT
TEMPERATURE



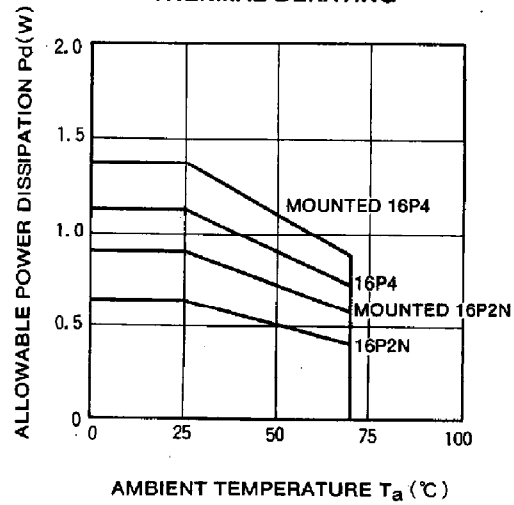
AMBIENT TEMPERATURE T_a ($^\circ\text{C}$)

QUADRUPLE HIGH-SPEED CCD CLOCK DRIVER

SUPPLY CURRENT VS OPERATING FREQUENCY



THERMAL DERATING



APPLICATION EXAMPLE

