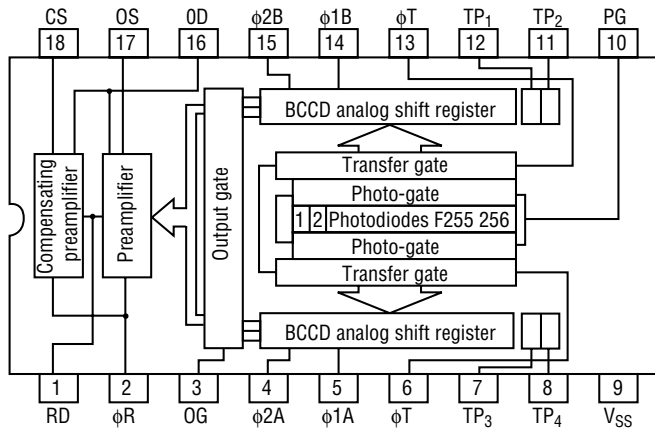


• Pin Connection Block Diagram



SS

Symbol	Name	Symbol	Name
RD	Reset transistor drain	TP ₁	Test pin (electrical input gate)
φR	Reset transistor gate clock	TP ₂	Test pin (electrical input diode)
OG	Output gate	TP ₃	Test pin (electrical input gate)
φ1A	CCD register clock	TP ₄	Test pin (electrical input diode)
φ1B	CCD register clock	V _{SS}	Substrate bias
φ2A	CCD register clock	PG	Photo-gate
φ2B	CCD register clock	OD	Output transistor drain
φT	Phototransfer gate clock	OS	Output transistor source (video output)
		CS	Compensating transistor source (noise output)

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Test Condition	Min.	Max.	Unit
Storage Temperature	T _{stg}	, —	-40	+125	°C
Operating Temperature	T _{op}	—	-20	+85	°C
Clock Voltage	V _φ	T _a =25°C	-0.3	+18	V
Applied Voltage	V _{DD}		-0.3	+18	V

ELECTRICAL CHARACTERISTICS

(Ambient Temperature T_a=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	
Reset Drain Voltage		V _{OD}	11.4	12	12.6	V	
		V _{RD}	11.4	12	12.6	V	
Output Transistor Drain Voltage		V _{OG}	4.75	5	5.25	V	
Output Gate Voltage		V _{PG}	4.75	5	5.25	V	
Substrate Bias		V _{SS}	-1.5	-2.0	-2.5	V	
Electrical Input Diode Voltage (TP _{2,4})		V _{IS}	11.4	12	12.6	V	
Electrical Input Gate Voltage (TP _{1,3})		V _{IG}	-0.1	0	0.2	V	
Clock Pulse Voltage	CCD register	"H"	V _{φ_{1,2}} ^{AB} _H	7	V _{DD}	V _{DD}	V
		"L"	V _{φ_{1,2}} ^{AB} _L	0	0.4	0.8	V
	Photo-transfer	"H"	V _{φ_{1,2}} ^{AB}	7	V _{DD}	V _{DD}	V
		"L"	V _{φTL}	0	0.4	0.8	V
	Reset	"H"	V _{φRH}	7	V _{DD}	V _{DD}	V
		"L"	V _{φRL}	0	0.4	0.8	V
Video Frequency		f _v	0.1	—	4	MHz	
Clock Input Capacitance	CCD register	C _{φ_{1,2}} ^{AB}	—	80	—	pF	
	Photo-transfer	C _{φT}	—	10	—	pF	
	Reset	C _{φR}	—	4	—	pF	
Power Dissipation		P _D	—	80	—	mW	
Output Load Resistance		R _L	—	1	—	kΩ	

POTOELECTRIC CHARACTERISTICS

(Ambient Temperature Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Sensitivity	R _w	—	1500	—	mV/ℓx • sec	*1
Saturation Output Voltage	V _{sat}	180	250	—	mV	*2
Output Uniformity ^{*007*} (Overall)	U	—	—	±7	%	*3
Output DC Level	V _{dc}	—	4.0	—	V	—
Dark Output Voltage	V _d	—	—	4	mV	*4

*1 2856K tungsten lamp

*2 V_{RD}, V_{DD}=12 V, V_{SS}=2.0 V, R_L=1 kΩ

*3 When it is 50 percent of the saturation output (2856K tungsten lamp.)

However, this excludes the 1st, 2nd, and 256th bits

*4 Storage time is assumed to be 10 ms.

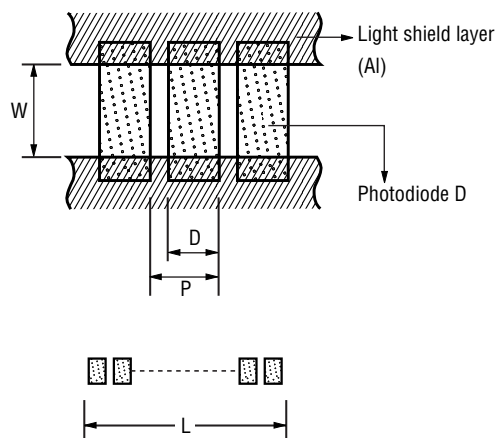
PIXEL CONFIGURATION

(Ambient Temperature Ta=25°C)

Parameter	Symbol	Central Value	Accuracy	Unit
Arrangement	—	Straight line	—	—
Number of Pixels	—	256	—	—
Pixels Pitch	P	13	±2.0	μm
Photodiode Width	D	8	±2.0	μm
Aperture Width	W	18	±2.5	μm
Sensor Length	L	3328	±3.0	μm

* See output timing for information concerning dummy pixels.

Pixel Configuration Diagram

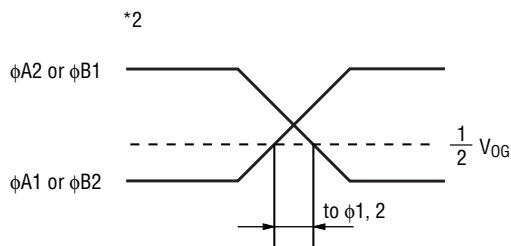
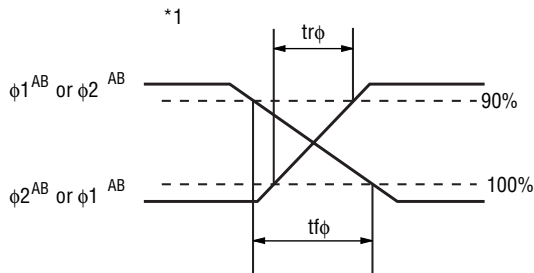


CLOCK INPUT TIMING CHARACTERISTICS

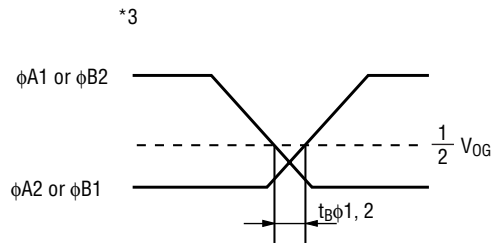
(Ambient Temperature $T_a=25^\circ\text{C}$)

	Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Register	Rise time	$t_{r\phi}$	—	30	100	ns	*1
	Fall time	$t_{f\phi}$	—	20	100	ns	
	Overlap time	$t_{O\phi 1, 2}$	0	20	100	ns	*2
	Blank time	$t_{B\phi 1, 2}$	—	20	100	ns	*3
Phototransfer	Rise time	$t_{r\phi T}$	—	30	100	ns	*4
	Fall time	$t_{f\phi T}$	—	20	100	ns	
	Transfer time duration	$t_{W\phi R}$	5	10	15	μs	
	Setup time	$t_{S\phi T}$	0	1	10	μs	
	Hold time	$t_{H\phi T}$	0	1	10	μs	
Reset	Rise time	$t_{r\phi R}$	—	30	100	ns	*5
	Fall time	$t_{f\phi R}$	—	20	100	ns	
	Duration	$t_{W\phi R}$	80	—	2000	ns	
	Setup time	$t_{S\phi R}$	170	—	2000	ns	
	Hold time	$t_{H\phi R}$	0	—	2000	ns	

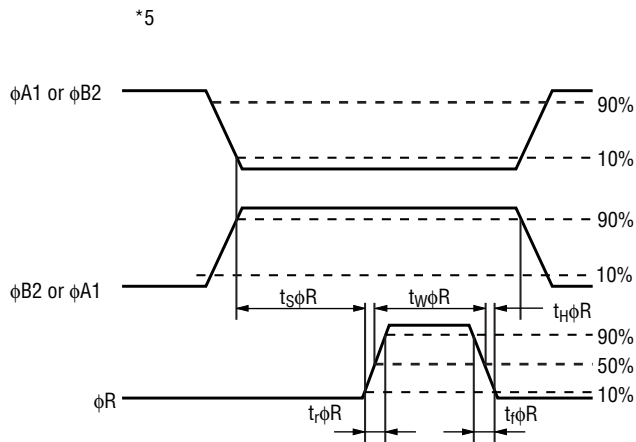
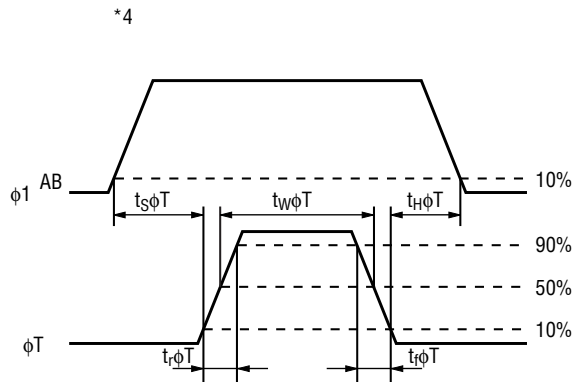
OPA256C-1 Input Timing Diagrams



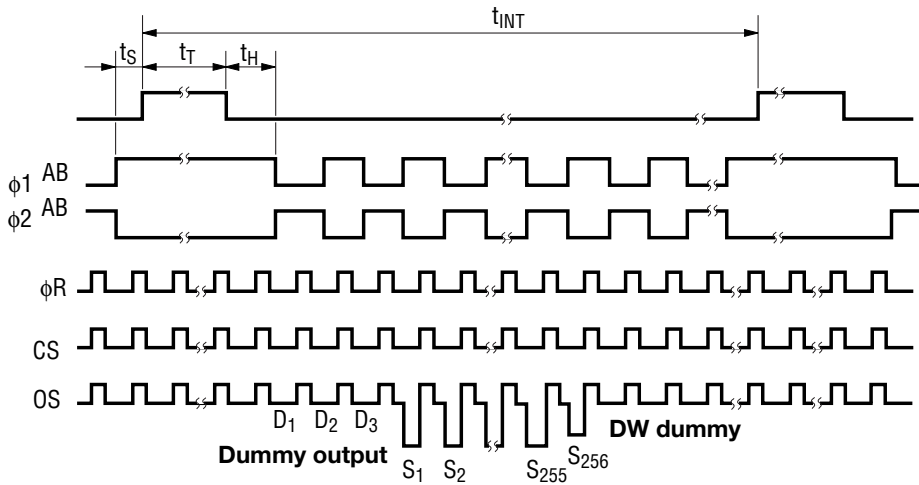
Limited to periods during $\phi A 1$ rise and $\phi A 2$ fall, and $\phi B 2$ rise and $\phi B 1$ fall.



Limited to periods during $\phi A2$ rise and $\phi A1$ fall, and $\phi B1$ rise and $\phi B2$ fall.



Input Timing Chart



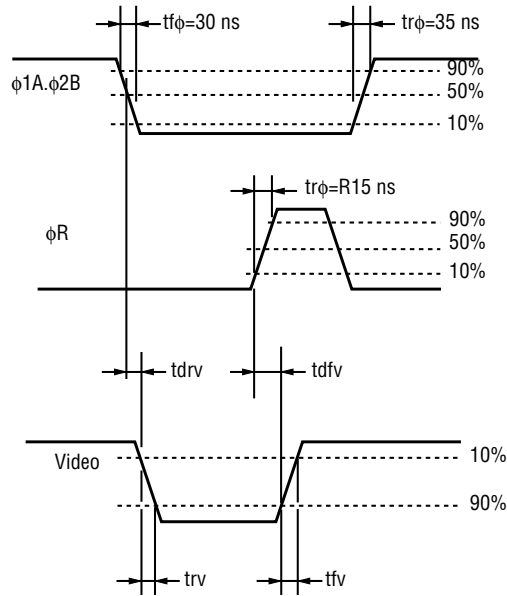
VIDEO OUTPUT TIMING CHARACTERISTICS

(Ambient Temperature $T_a=25^\circ\text{C}$)

Parameter	Symbol	Guaranteed Values			Unit	Note
		Min.	Typ.	Max.		
Video Rise Delay Time	t_{drv}	—	55	—	ns	—
Video Rise Time	t_{rv}	—	55	—	ns	—
Video Fall Delay Time	t_{dfv}	—	15	—	ns	—
Video Fall Time	t_{fv}	—	30	—	ns	—

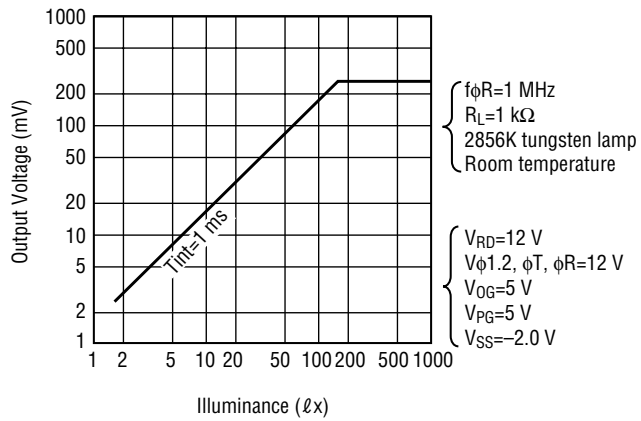
Conditions $\left\{ \begin{array}{l} V_{DD}=V_{RD}=V_{\phi}=12\text{ V} \\ V_{DG}=V_{PG}=5\text{ V} \\ V_{SS}=-2\text{ V} \end{array} \right. \quad \begin{array}{l} R_L=1\text{ k}\Omega \\ C_L=31\text{ pF} \\ T_a=25^\circ\text{C} \end{array} \quad \begin{array}{l} t_{r\phi}=30\text{ ns} \\ t_{f\phi}=35\text{ ns} \\ t_{r\phi R}=15\text{ ns} \end{array}$

Output Timing Diagrams

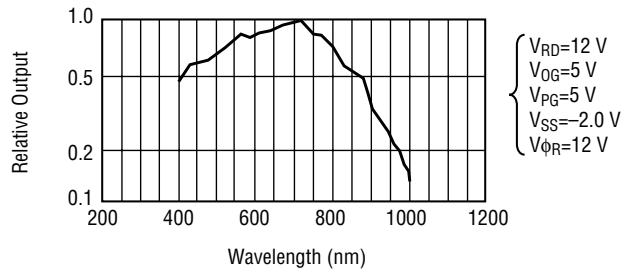


TYPICAL CHARACTERISTICS

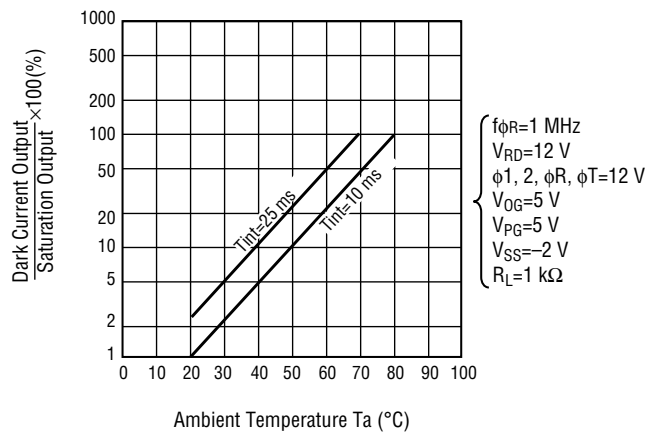
• Illuminance vs. Output Characteristics



• Spectral Sensitivity Characteristic



• Dark vs. Temperature Characteristics



• M.T.F. Characteristics (White Fluorescent Lamp)

