

HAMAMATSU

TECHNICAL DATA

**HIGH-SPEED MINI-FLAT
PHOTOCOUPLER
P3054**

T-41-89

**High-speed LED input, High-speed photo IC output (digital output),
6-pin mini-flat package offers surface mounting**

The P3054 is a high-speed photocopier with digital output, consisting of a high-speed infrared LED on the input side and a high-speed photo IC on the output side. The 6-pin mini-flat package allows surface mounting on a printed circuit board. High-speed operation (60ns typ.) makes the P3054 suited for the interface for the RGB signals of AVTVs, computer logic signals, and other similar applications.

FEATURES

- Ultra-high-speed response : 60 ns Typ.
- 6-pin mini-flat package
- TTL compatible
- High input-output isolation voltage : 2500 Vrms Min.
- Low input current operation
- Surface mountable
- Taping available (option)
- UL listed (E75221)

APPLICATIONS

- RGB interface for AVTV
- Logic signal interface for computers
- Signal interface for musical instruments
- High-speed line receivers
- Data transmission equipment

MAXIMUM RATINGS (Ta = 25°C)

	Parameters	Symbols	Ratings	Unit
Input	Forward Current	I_F	20	mA
	Reverse Voltage	V_R	5	V
	Power Dissipation	P	40	mW
Output	Supply Voltage	V_{CC}	7	V
	Output Voltage	V_O	7	V
	Output Current	I_O	50	mA
	Output Collector Power Dissipation	P_C	85	mW
	Isolation Voltage (1)	V_{iso}	2500	Vrms
	Operating Temperature	T_{opr}	0 ~ +70	°C
	Storage Temperature	T_{stg}	-40 ~ +100	°C
	Soldering Temperature		260°C, within 10 sec.	

(1) RH40~60%, 1 minute

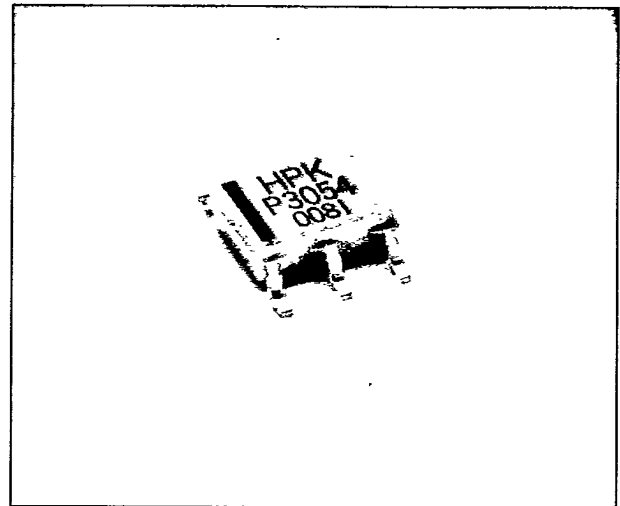
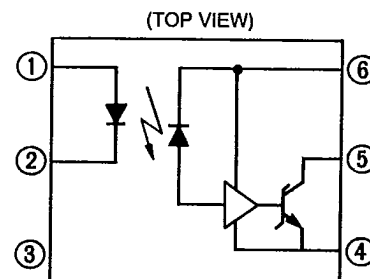
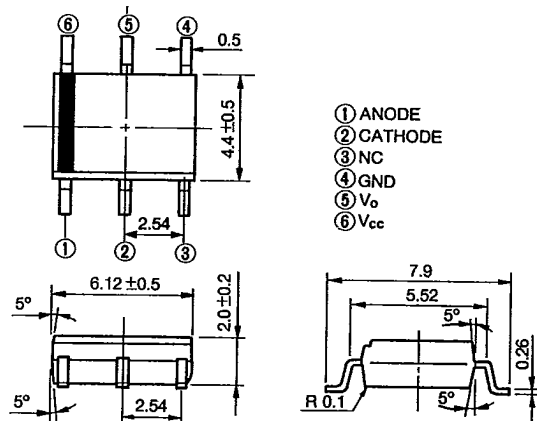


Figure 1: Dimensional Outline and Pin Connection (Unit:mm)



HIGH-SPEED MINI-FLAT PHOTOCOUPLER P3054**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

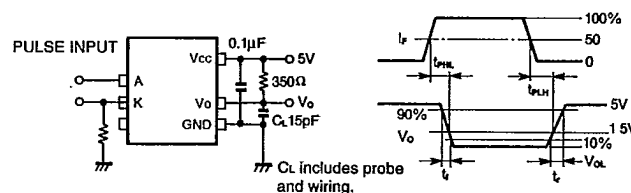
Parameters		Symbols	Conditions	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	$T_a = 25^\circ\text{C}$, $I_F = 10\text{mA}$	—	1.6	1.9	V
	Reverse Current	I_R	$T_a = 25^\circ\text{C}$, $V_R = 5\text{V}$	—	—	10	μA
	Terminal Capacitance	C_t	$T_a = 25^\circ\text{C}$, $V = 0$, $f = 1\text{MHz}$	—	50	—	pF
Output	High Level Output Current	I_{OH}	$V_{CC} = V_O = 5.5\text{V}$, $I_F = 250\mu\text{A}$	—	—	250	μA
	Low Level Output Voltage	V_{OL}	$V_{CC} = 5.5\text{V}$, $I_F = 5\text{mA}$, $I_{OL} = 13\text{mA}$	—	0.4	0.6	V
	High Level Supply Current	I_{CCH}	$V_{CC} = 5.5\text{V}$, $I_F = 0$	—	7	15	mA
	Low Level Supply Current	I_{CCL}	$V_{CC} = 5.5\text{V}$, $I_F = 10\text{mA}$	—	13	18	mA
Transfer Characteristics	H→L Threshold Input Current (1)	I_{FHL}	$V_{CC} = 5\text{V}$, $V_O = 0.8\text{V}$, $R_L = 350\Omega$	—	—	5	mA
	Isolation Resistance	R_{iso}	$T_a = 25^\circ\text{C}$, DC500V, $R_H = 40 \sim 60\%$	5×10^{10}	—	—	Ω
	Input-Output Capacitance	C_t	$T_a = 25^\circ\text{C}$, $V = 0$, $f = 1\text{MHz}$	—	0.8	5	pF
	Current Transfer Ratio	CTR	$T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$, $I_F = 5\text{mA}$, $R_L = 100\Omega$	260	—	—	%
	Response Characteristics	H→L Propagation Delay Time (2)	$T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$, $R_L = 350\Omega$, $I_F = 7.5\text{mA}$	—	60	120	ns
		L→H Propagation Delay Time (2)		—	60	120	ns
		Rise/Fall Times (2)		—	—	60	ns
	CMR	High Level Common Mode (3)	$T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$, $V_{CM} = 10\text{V}$, $R_L = 350\Omega$, $I_F = 0$, $V_O \geq 2\text{V}$	—	180	—	V/ μs
		Low Level Common Mode (3)	$T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$, $V_{CM} = 10\text{V}$, $R_L = 350\Omega$, $I_F = 5\text{mA}$, $V_O \leq 0.8\text{V}$	—	360	—	V/ μs

RECOMMENDED CONDITIONS (Ta = 25°C)

Parameters	Symbols	Min.	Max.	Unit
Low Level Input Current	I_{FL}	0	250	μA
High Level Input Current	I_{FH}	7	20	mA
Supply Voltage	V_{CC}	4.5	5.5	V
Fan Out (TTL)	N	—	8	—
Operating Temperature	T_{opr}	0	70	$^\circ\text{C}$

(1) Connect a capacitor of more than 0.1 μF between V_{CC} and GND.

(2) Measuring Circuit for t_{PHL} , t_{PLH} , t_r , t_f



(3) Measuring Circuit for CM_H , CM_L

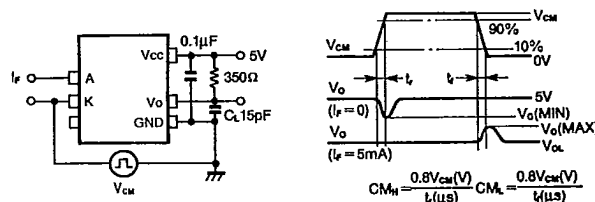


Figure 2: LED Allowable Power Dissipation vs. Temperature

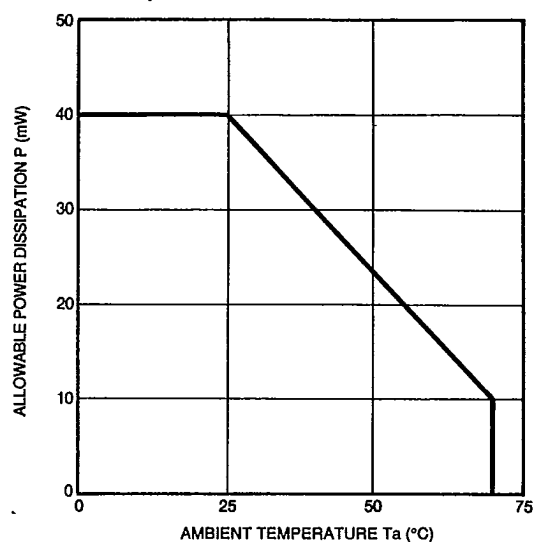


Figure 3: Collector Allowable Power Dissipation vs. Temperature

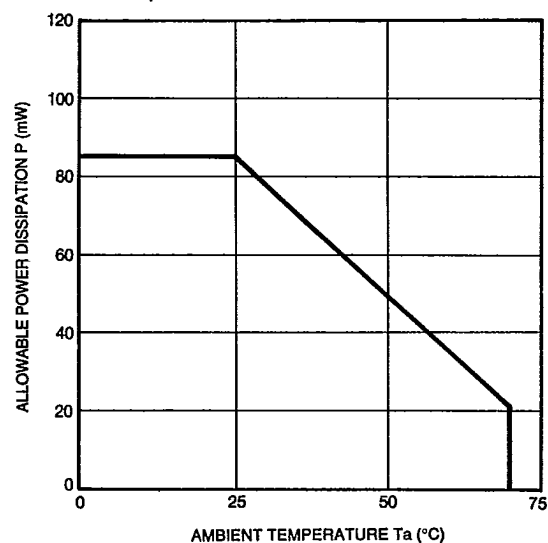


Figure 4: Forward Current vs. Forward Voltage

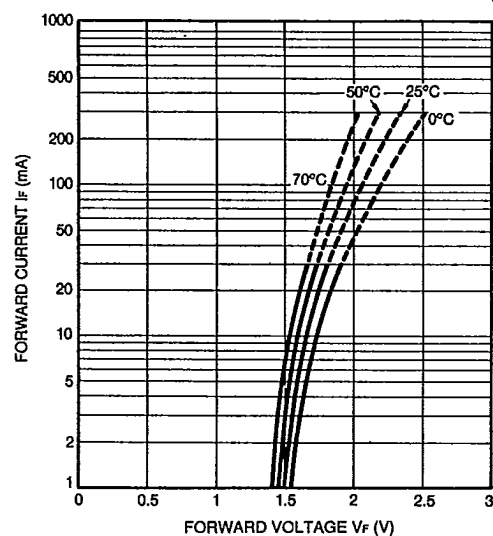


Figure 5: Output Voltage vs. Forward Current

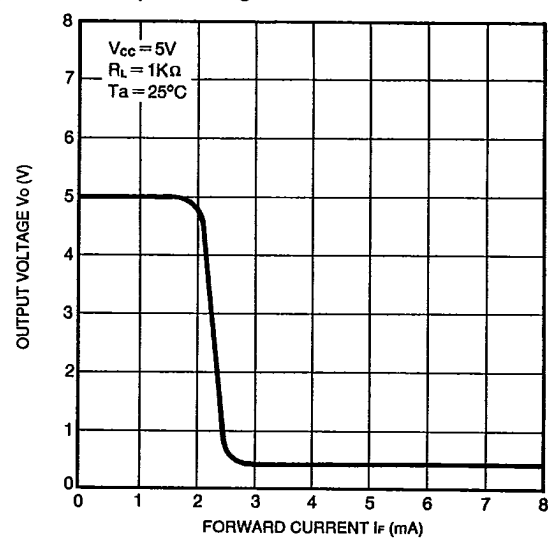


Figure 6: Supply Current vs. Temperature

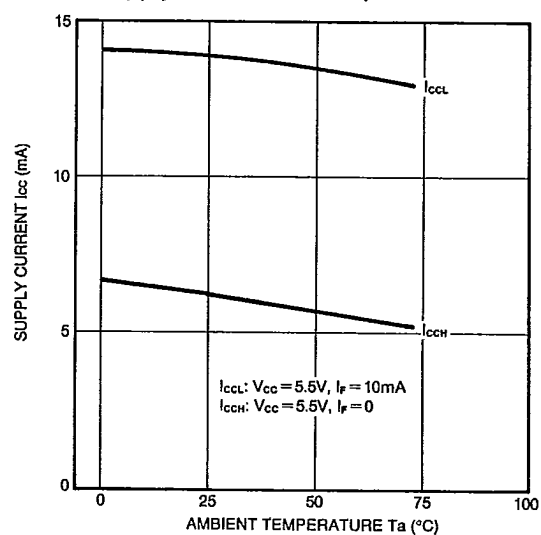
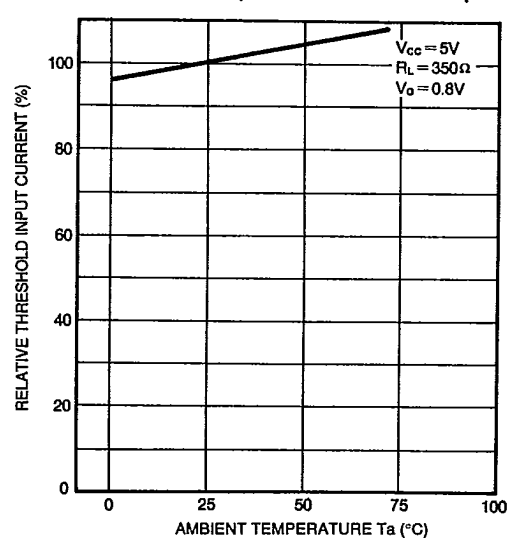


Figure 7: Threshold Input Current vs. Temperature



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Figure 8: Low Level Output Voltage vs. Temperature

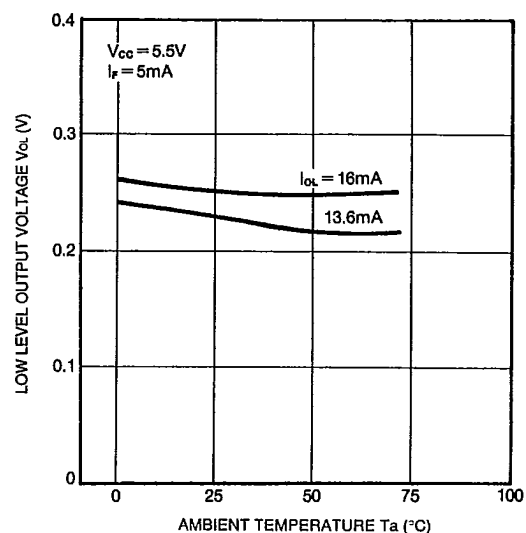


Figure 9: High Level Output Current vs. Temperature

