

Description

The general purpose optocouplers consist of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a standard plastic 6-pin dual-in-line package.

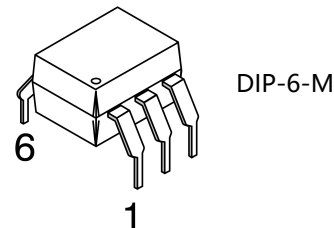
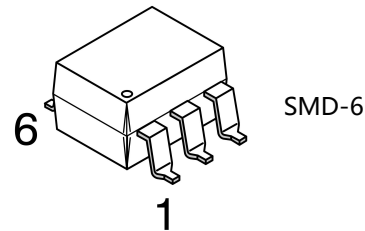
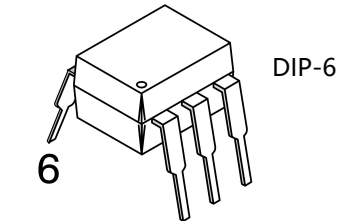
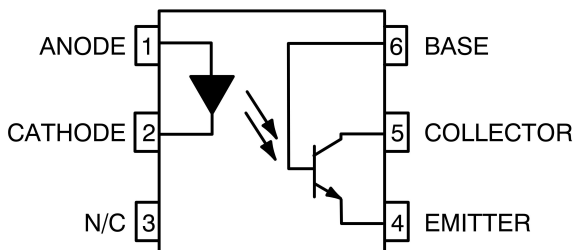
Features

- Minimum Current Transfer Ratio at $I_F = 10 \text{ mA}$, $V_{CE} = 10 \text{ V}$:
- 10% for CY4N27 and CY4N28
- 20% for CY4N25 and CY4N26
- 100% for CY4N35 and CY4N36 and CY4N37

Applications

- Power Supply Regulators
- Digital Logic Inputs
- Microprocessor Inputs

Block Diagram and Package



Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I _F	60	mA
	Reverse Voltage	V _R	6	V
	Forward Current – Peak (300 s, 2% Duty Cycle)	I _{F(pk)}	3	A
	Power Dissipation	P _D	120	mW
	Derate Above 25°C		1.14	mW/°C
Output	Collector Power Dissipation	P _C	150	mW
	Derate Above 25°C		1.76	mW/°C
	Collector-Emitter Voltage	V _{CEO}	30	V
	Collector-Base Voltage	V _{CBO}	70	V
	Emitter-Collector Voltage	V _{ECO}	7	V
Total Power Dissipation		P _{tot}	270	mW
Derate Above 25°C			2.94	mW/°C
Operating Temperature		T _{opr}	-40~+100	°C
Storage Temperature		T _{stg}	-40~+125	°C
Junction Temperature		T _J	-40~+125	°C
Soldering Temperature		T _{sol}	260	°C

Electro-optical Characteristics (Ta=25°C)

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage		V_F	$I_F=10\text{mA}$		1.2	1.5	V
Reverse Current		I_R	$V_R=6\text{V}$	-	-	10	μA
Collector Dark Current		I_{CEO}	$V_{CE}=10\text{V}$	-	-	50	nA
Base Dark Current		I_{CBO}	$V_{CE}=10\text{V}$	-	-	20	nA
Collector-Emitter Breakdown Voltage		BV_{CEO}	$I_C=0.1\text{mA}$, $I_F=0$	30	-	-	V
Collector-Base Breakdown Voltage		BV_{CBO}	$I_C=0.1\text{mA}$, $I_F=0$	70	-	-	V
Emitter-Collector Breakdown Voltage		BV_{ECO}	$I_E=100\mu\text{A}$, $I_F=0$	7	-	-	V
Current Transfer Ratio	CY4N35,CY4N36, CY4N37	CTR	$I_F=10\text{mA}$, $V_{CE}=10\text{V}$	100			%
	CY4N25,CY4N26			20			
	CY4N27,CY4N28			10			
	CY4N35,CY4N36, CY4N37		$I_F=10\text{mA}$, $V_{CE}=10\text{V}$, $T_A=-55^\circ\text{C}$	40	-	-	
	CY4N35,CY4N36, CY4N37		$I_F=10\text{mA}$, $V_{CE}=10\text{V}$, $T_A=+100^\circ\text{C}$	40	-	-	
Collector-Emitter Saturation Voltage	CY4N25,CY4N26, CY4N27,CY4N28	$V_{CE(sat)}$	$I_F=50\text{mA}$, $I_C=2\text{mA}$	-	-	0.5	V
	CY4N35,CY4N36, CY4N37		$I_F=10\text{mA}$, $I_C=0.5\text{mA}$	-	-	0.3	
Isolation Resistance		R_{ISO}	$V_{I-O}=\pm 500\text{VDC}$, $T_A=25^\circ\text{C}$	10^{11}	-	-	Ω
Input-Output Isolation Voltage		V_{ISO}	$t=1\text{Minute}$	5000	-	-	V_{RMS}
Isolation Capacitance		C_{ISO}	$V_{I-O}=0\text{V}$, $f=1\text{MHz}$	-	0.2	-	pF
Capacitance		C_{CE}	$V_{CE}=0$, $f=1\text{MHz}$	-	8	-	pF
Non-Saturated Turn-on Time	CY4N25,CY4N26, CY4N27,CY4N28	T_{ON}	$V_{CE}=10\text{V}$, $I_C=10\text{mA}$, $R_L=100\Omega$	-	2	-	μs
	CY4N35,CY4N36, CY4N37		$V_{CE}=10\text{V}$, $I_C=2\text{mA}$, $R_L=100\Omega$	-	2	10	
Turn-off Time	CY4N25,CY4N26, CY4N27,CY4N28	T_{OFF}	$V_{CE}=10\text{V}$, $I_C=10\text{mA}$, $R_L=100\Omega$	-	2	-	μs
	CY4N35,CY4N36, CY4N37		$V_{CE}=10\text{V}$, $I_C=2\text{mA}$, $R_L=100\Omega$	-	2	10	

TYPICAL PERFORMANCE CURVES

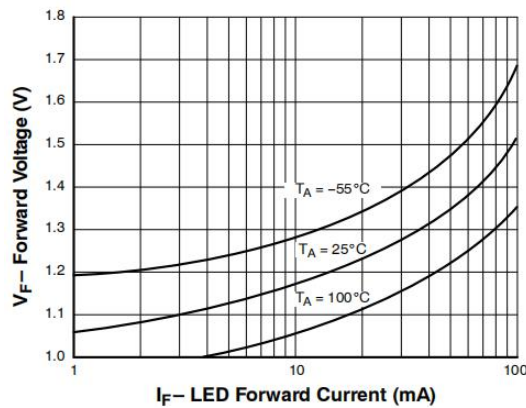


Figure 1. LED Forward Voltage vs. Forward Current

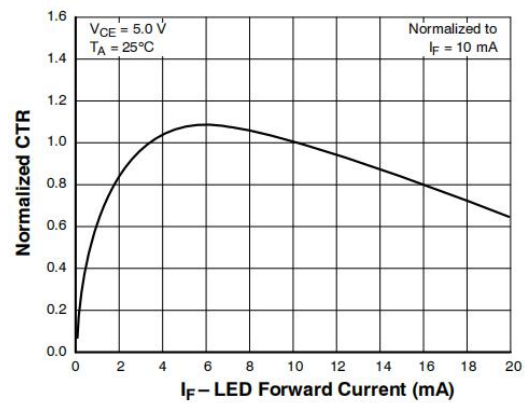


Figure 2. Normalized CTR vs. Forward Current

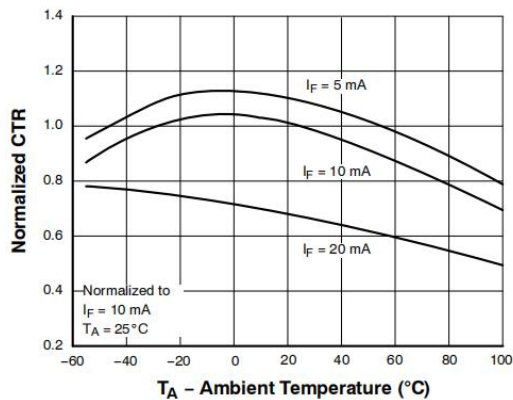


Figure 3. Normalized CTR vs. Ambient Temperature

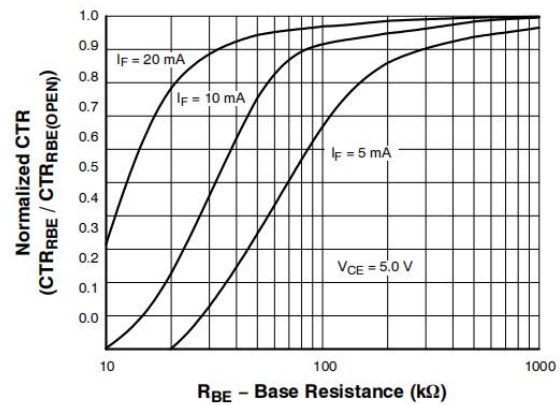


Figure 4. CTR vs. R_BE (Unsaturated)

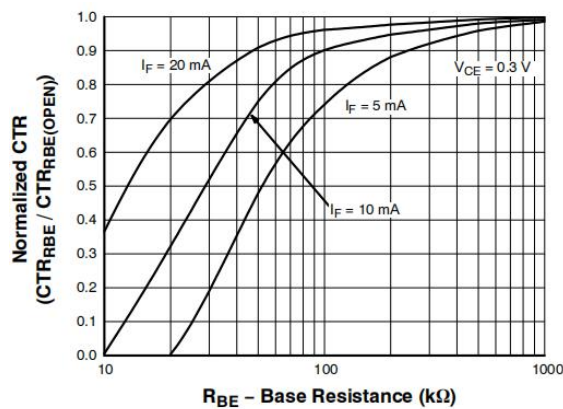


Figure 5. CTR vs. R_BE (Saturated)

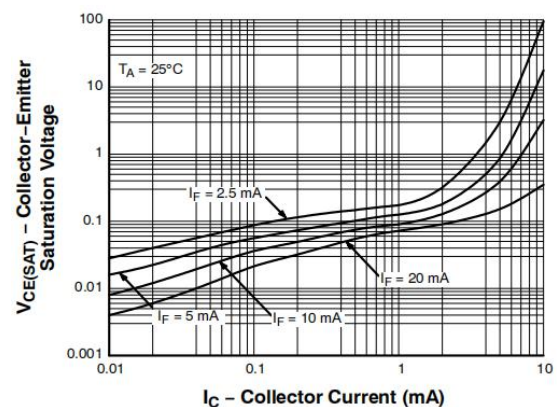


Figure 6. Collector-Emitter Saturation Voltage vs.

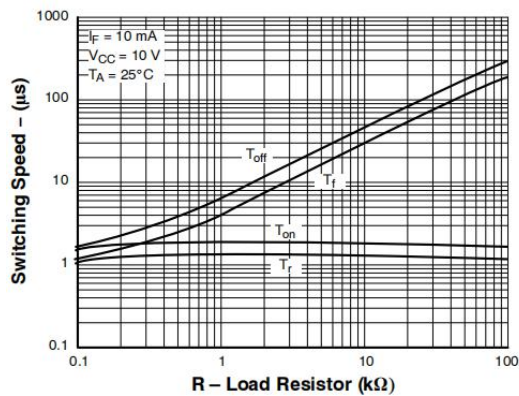


Figure 7. Switching Speed vs. Load Resistor

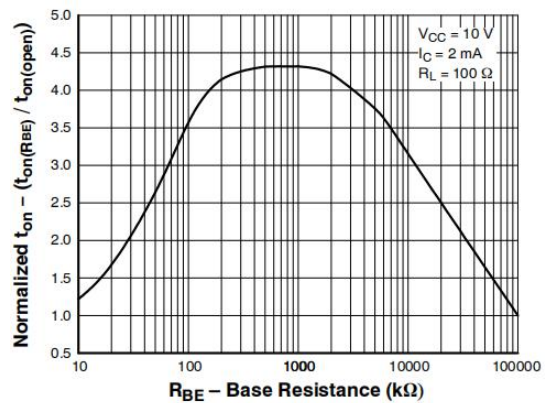


Figure 8. Normalized t_{on} vs. R_{BE}

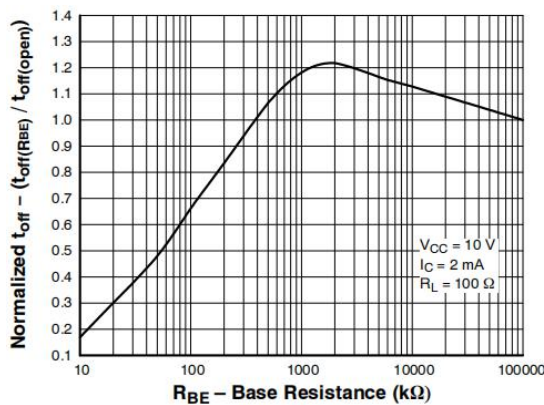


Figure 9. Normalized t_{off} vs. R_{BE}

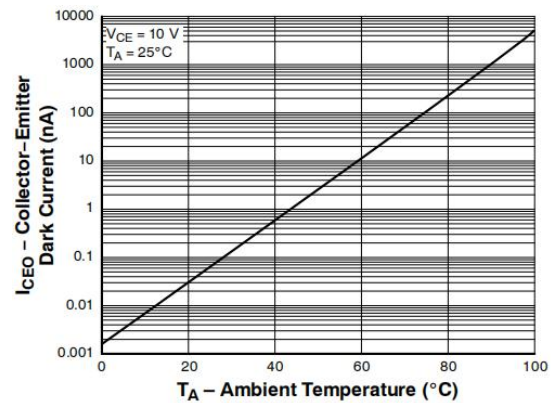


Figure 10. Dark Current vs. Ambient Temperature

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS

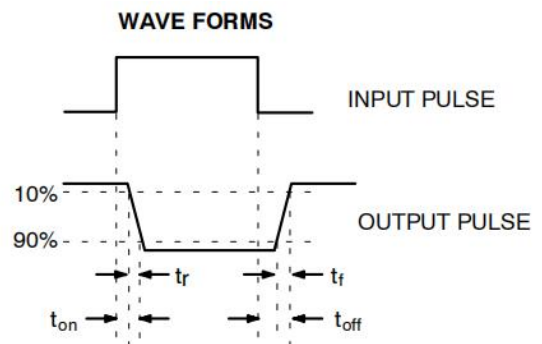
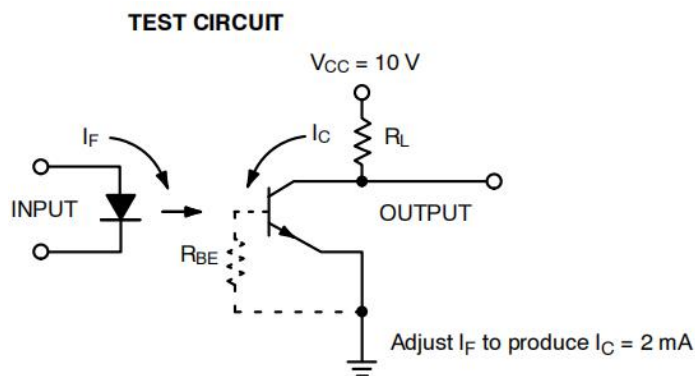
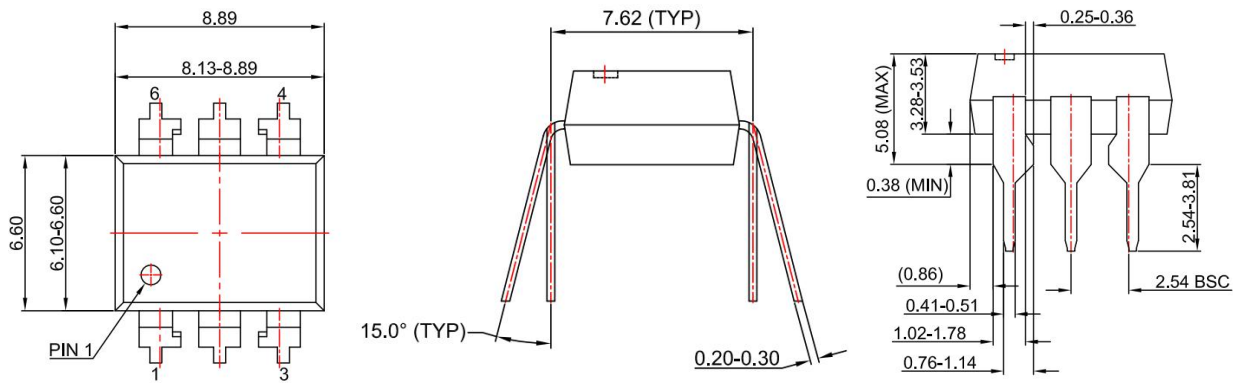


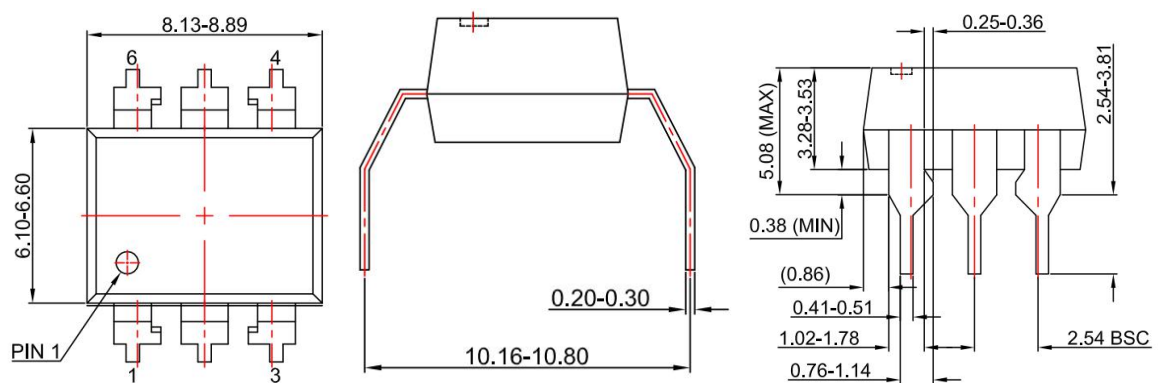
Figure 11. Switching Time Test Circuit and Waveform

Outline Dimensions

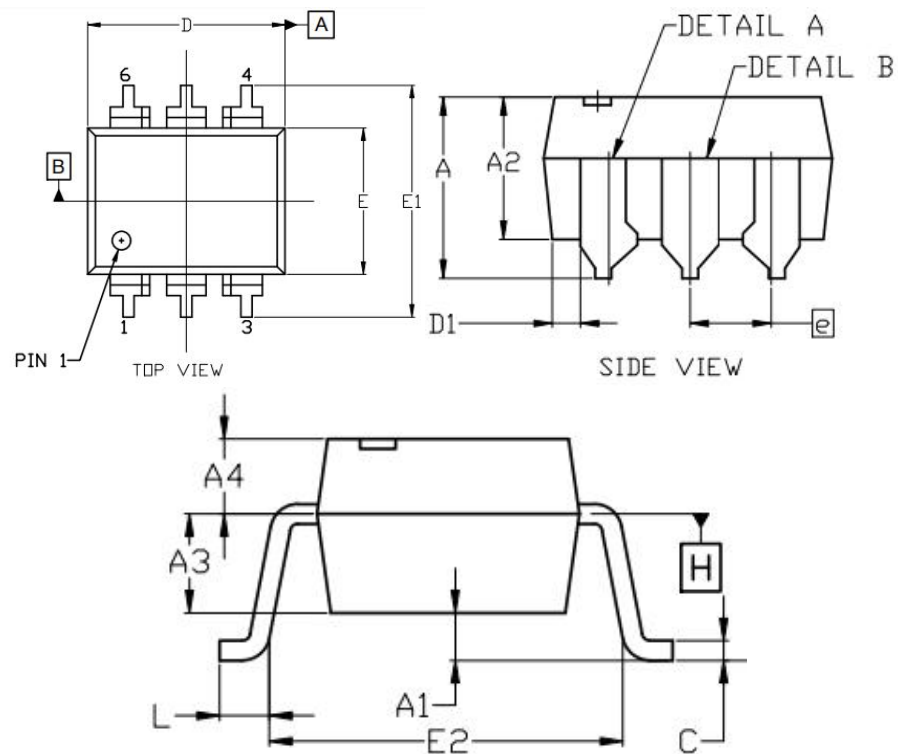
1) DIP-6



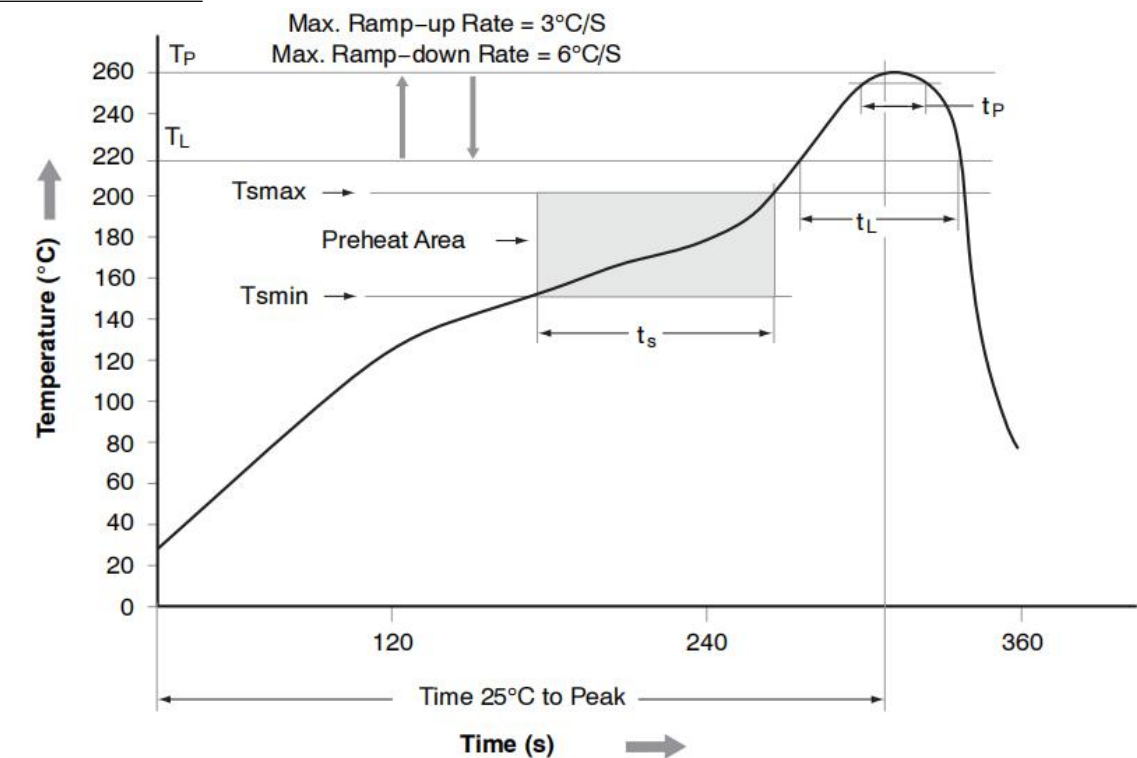
2) DIP-6-M



3) SMD-6



Solder Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T _{min})	150°C
Temperature Max. (T _{max})	200°C
Time (t _s) from (T _{min} to T _{max})	60–120 seconds
Ramp-up Rate (t _L to t _p)	3°C/second max.
Liquidous Temperature (T _L)	217°C
Time (t _L) Maintained Above (T _L)	60–150 seconds
Peak Body Package Temperature	260°C +0°C / –5°C
Time (t _p) within 5°C of 260°C	30 seconds
Ramp-down Rate (T _p to T _L)	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

Figure 12. Reflow Profile

Attention:

- CHEUK YUI will continue to improve the quality, reliability, function or design and provide better products ,We reserve the right to modify this specification at any time without prior notice.
- Before placing an order, please confirm that the information on hand is the latest version, and the customer needs to confirm that the chip does meet their needs and can meet their requirements.
- Please comply with the product specifications for use, CHEUK YUI is not responsible for the quality problems caused by non-compliance with the product specifications during use.
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- Please take measures to prevent static damage when using this product.
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