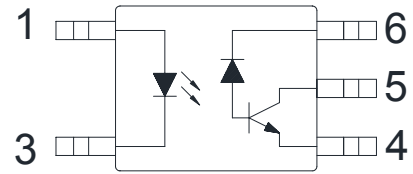


### ● Description

The KPC457 series consist of a LED. It is a high-speed digital output type photocoupler. And it is packaged in a 5pin mini-flat package.

### ● Schematic



- 1. Anode
- 3. Cathode
- 4. GND(Emitter)
- 5. Vo (Open collector)
- 6. Vcc

### ● Features

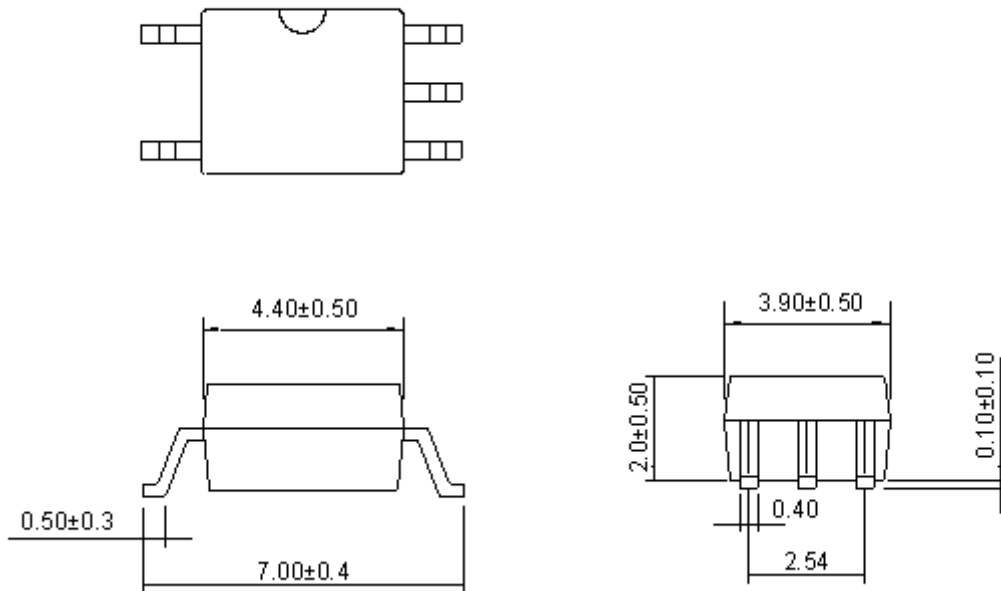
1. Pb free and RoHS compliant
2. 5 pin mini-flat package
3. High speed response (tPLH:typ.0.2us, tPHL:typ.0.4us)
4. High instantaneous common mode rejection voltage ( $C_{MH}$ : Min. 15KV/us,  $C_{ML}$ : Min. -15KV/us)
5. High isolation voltage between input and output (Viso: 3750Vrms)
6. MSL class 1
7. Agency Approvals:
  - UL Approved (No. E169586): UL1577
  - c-UL Approved (No. E169586)
  - VDE Approved (No. 40020973): DIN EN60747-5-5

### ● Applications

- Computers, measuring instruments, control equipment
- High speed line receivers, high speed logic
- Telephone sets
- Signal transmission between circuits of different potentials and impedances

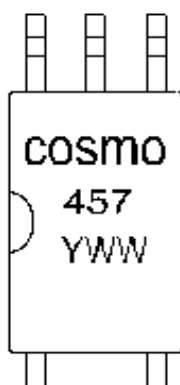
● **Outside Dimension**

Unit : mm



TOLERANCE:  $\pm 0.2$ mm

● **Device Marking**



**Notes:**

**cosmo**

457

YWW

Y: Year code / WW: Week code

### ● Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current (*1)	$I_F$	25	mA
	Peak forward current (*2)	$I_{FM}$	200	mA
	Reverse voltage	$V_R$	5	V
	Power dissipation	$P_D$	45	mW
Output	Supply voltage	$V_{CC}$	-0.5 to +30	V
	Output voltage	$V_{OIL}$	-0.5 to +20	V
	Output current	$I_{OL}$	8	mA
	Power dissipation (*3)	$P_O$	100	mW
Total power dissipation (*3)		$P_{tot}$	100	mW
Isolation voltage 1 minute (*4)		$V_{iso}$	3750	Vrms
Operating temperature		$T_{opr}$	-55 to +85	°C
Storage temperature		$T_{stg}$	-55 to +125	°C
Soldering temperature 10 seconds		$T_{sol}$	260	°C

\*1 When ambient temperature goes above 70°C, the power dissipation goes down at 0.8mA/°C.

\*2 When ambient temperature goes above 70°C, the power dissipation goes down at 1.5mW/°C.

\*3 When ambient temperature goes above 70°C, the power dissipation goes down at 1.8mW/°C.

\*4 40 to 80%RH AC for 1 minute=60HZ.

### ● Electro-optical Characteristics

(Ta= 25°C)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	$V_F$	$I_F=16mA$	-	1.7	1.95	V
	Reverse current	$I_R$	$V_R=5V$	-	-	10	uA
	Terminal capacitance	$C_t$	$V=0, f=1MHz$	-	60	250	pF
Output	High level output current (1)	$I_{OH}(1)$	$I_F=0, V_{CC}=5.5V, V_O=5.5V$	-	3	500	nA
	High level output current (2)	$I_{OH}(2)$	$I_F=0, V_{CC}=15V, V_O=15V$	-	-	1.0	uA
	High level output current (3) (*6)	$I_{OH}(3)$		-	-	50	uA
	High level supply current (1)	$I_{CCH}(1)$		$I_F=0, V_{CC}=15V, V_O=Open$	-	0.02	1.0
	High level supply current (2) (*6)	$I_{CCH}(2)$	-		-	2.0	uA
	Low level supply current	$I_{CCL}$	$I_F=16mA, V_{CC}=15V, V_O=Open$	-	120	-	uA
	Low level supply voltage	$V_L$	$I_F=16mA, V_{CC}=4.5V, I_O=2.4mA$	-	-	0.4	V
Transfer Characteristics	Current transfer ratio (1)	CTR(1)	$I_F=16mA, V_{CC}=4.5V, V_O=0.4V, R_L=1.9K\Omega$	19	-	50	%
	Current transfer ratio (2) (*6)	CTR(2)		15	-	-	%
	Isolation resistance	$R_{ISO}$	$DC=500V, 40\text{ to }60\%RH$	$5 \times 10^{10}$	$1 \times 10^{11}$	-	$\Omega$
	Floating capacitance	$C_f$	$V=0, f=1MHz$	-	0.6	1.0	pF
	“High-->Low” propagation delay time	$t_{PHL}$	$I_F=16mA, V_{CC}=5V, R_L=1.9K\Omega$	-	0.2	0.8	us
	“High-->Low” propagation delay time	$t_{PLH}$		-	0.4	0.8	us
	Instantaneous common mode rejection voltage (High level output)	$C_{MH}$	$I_F=0, V_{CC}=5V, V_{CM}=1.0KV(p-p), R_L=1.9K\Omega$	15	30	-	KV/us



# KPC457 Series

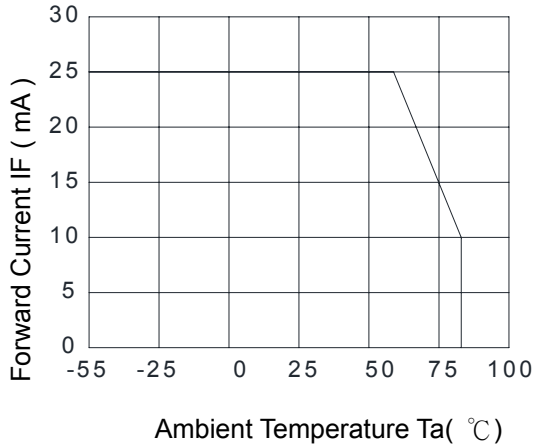
## 5PIN HIGH-SPEED OUTPUT PHOTOCOUPLER

	Instantaneous common mode rejection voltage (High level output)	$C_{ML}$	$I_F=16mA, V_{CC}=5V,$ $V_{CM}=1.0KV(p-p),$ $R_L=1.9K\Omega$	-15	-30	-	KV/us
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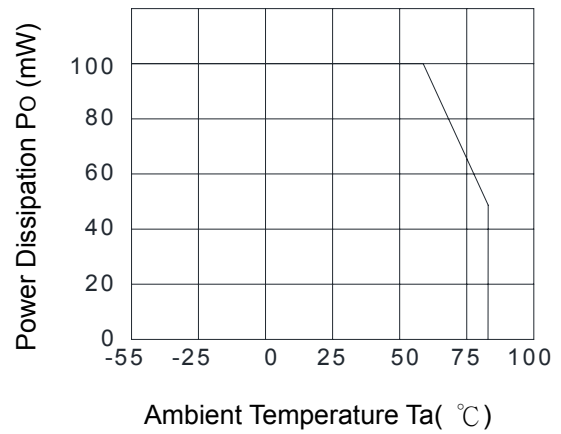
\*5 It shall connect a by-pass capacitor of 0.01uF or more between Vcc (pin 6) and GND(pin 4) near the device ,when it measures transfer characteristics and the output side characteristics.

\*6 Ta=0 to 70°C.

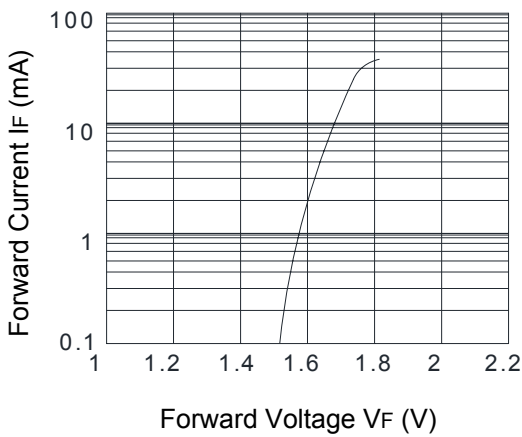
**Fig.1 Forward Current vs. Ambient Temperature**



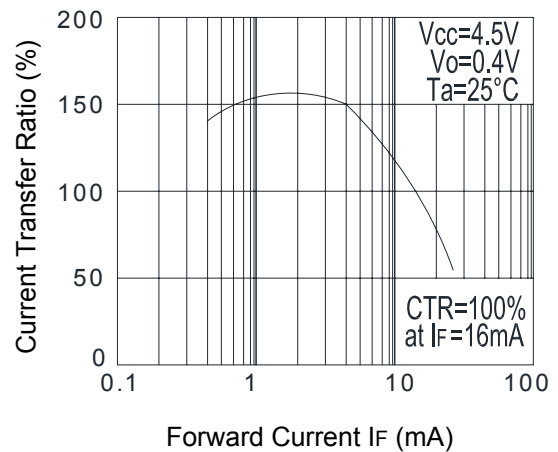
**Fig.2 Power Dissipation vs. Ambient Temperature**



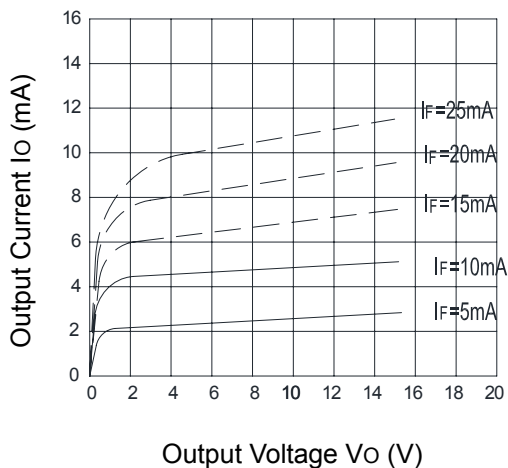
**Fig.3 Forward Current vs. Forward Voltage**



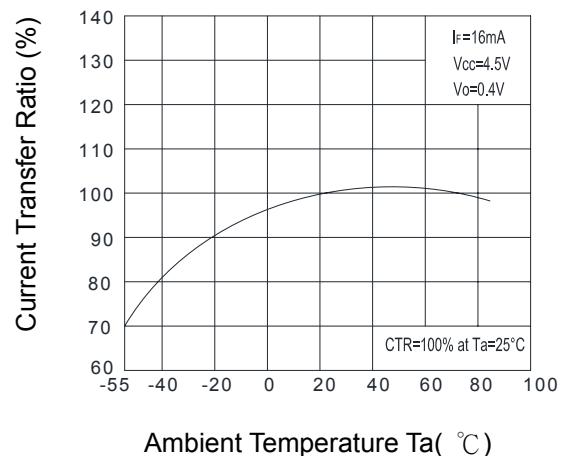
**Fig.4 Current Transfer Ratio vs. Forward Current**



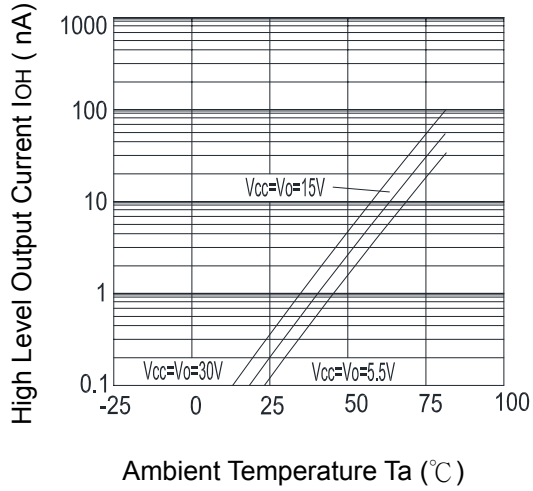
**Fig.5 Output Current vs. Output Voltage**



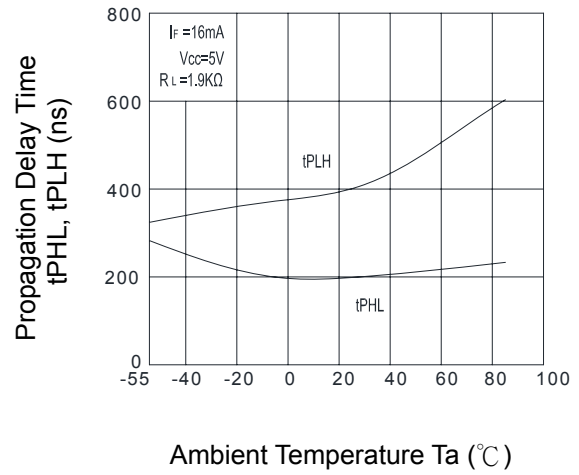
**Fig.6 Current Transfer Ratio vs. Ambient Temperature**



**Fig.7 Pulse Width Distortion vs. Ambient Temperature**



**Fig.8 Propagation Delay Time vs. Ambient Temperature**

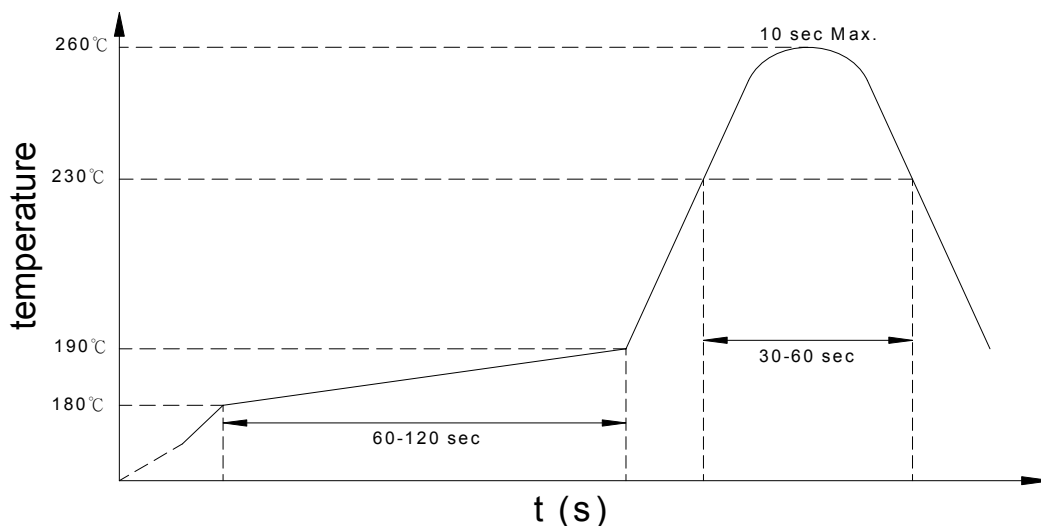


● **Recommended Soldering Conditions**

**(a) Infrared reflow soldering :**

- Peak reflow soldering : 260°C or below (package surface temperature)
- Time of peak reflow temperature : 10 sec
- Time of temperature higher than 230°C : 30-60 sec
- Time to preheat temperature from 180~190°C : 60-120 sec
- Time(s) of reflow : Two
- Flux : Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

**Recommended Temperature Profile of Infrared Reflow**



**(b) Wave soldering :**

- Temperature : 260°C or below (molten solder temperature)
- Time : 10 seconds or less
- Preheating conditions : 120°C or below (package surface temperature)
- Time(s) of reflow : One
- Flux : Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

**(c) Cautions :**

- Fluxes : Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.
- Avoid shorting between portion of frame and leads.

- **Numbering System**

### KPC457 (Z)

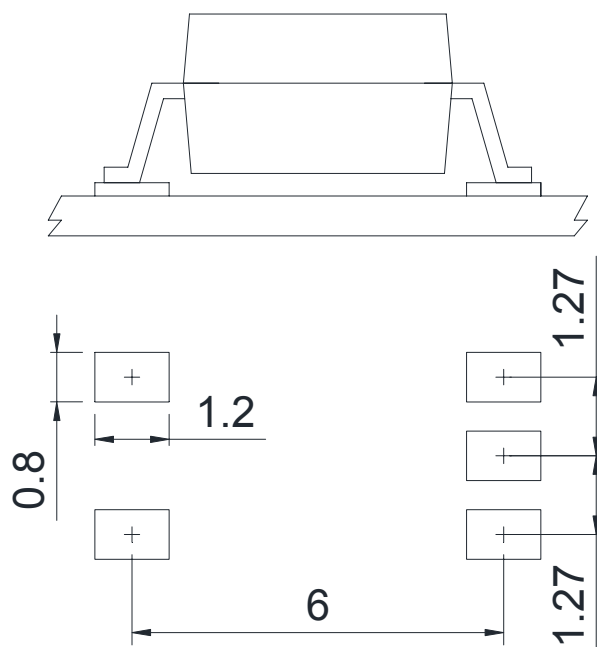
**Notes:**

KPC457 = Part No.

Z = Tape and reel option (TLD, TRU)

Option	Description	Packing quantity
TLD	TLD tape & reel option	3000 units per reel
TRU	TRU tape & reel option	3000 units per reel

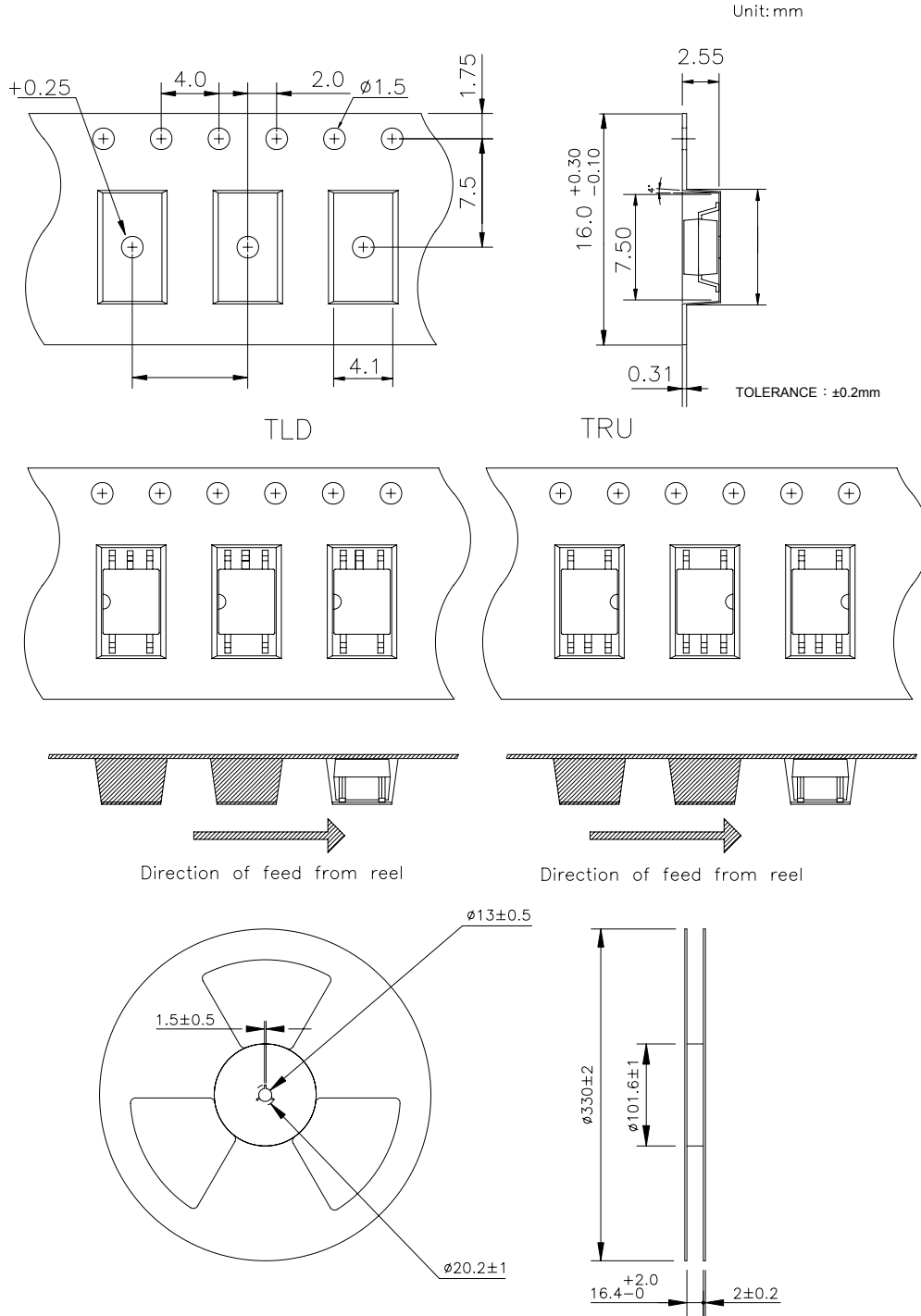
- **Recommended Pad Layout for Surface Mount Lead Form**



Unit : mm



● SOP Carrier Tape & Reel



- **Application Notice**

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