

FEATURES

- **2 CHANNEL TYPE:**
OCMOS FET + PHOTOCOUPLER
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL PACKAGE:**
8-PIN SOP
- **ISOLATION VOLTAGE:**
BV: 1500 Vr.m.s. MIN
- **LOW OFFSET VOLTAGE**
- **LOW LED OPERATING CURRENT:**
IF = 2 mA
- **AVAILABLE IN TAPE AND REEL**

DESCRIPTION

PS7241-AT1 and PS7241-AT5 are solid state relays containing a GaAs LED on the emitting side (input side) and MOSFETs (+ Phototransistor) on the output side. They are suitable for analog signal control because of their low offset and high linearity.

APPLICATIONS

- EXCHANGE EQUIPMENT
- MEASUREMENT EQUIPMENT
- FA/OA EQUIPMENT

ELECTRICAL CHARACTERISTICS (TA = 25°C)

PART NUMBER						PS7241-AT1, PS7241-AT5		
		SYMBOLS	PARAMETERS	CONDITIONS	UNITS	MIN	TYP	MAX
OCMOS FET	Diode	VF	Forward Voltage	IF = 5 mA	V		1.2	1.4
		IR	Reverse Current	VR = 5 V	μA			5.0
	MOSFET	ILOFF	Off-state Leakage Current	VD = 400 V	μA		0.03	1.0
		Cout	Output Capacitance	VD = 0 V, f = 1 MHz	pF		65	
	Coupler	IFon	LED On-state Current	IL = 120 mA	mA			2.0
		RON1	On-state Resistance	IF = 10 mA, IL = 10 mA	Ω		20	30
		RON2		IF = 10 mA, IL = 120 mA, t ≤ 10 ms	Ω			25
		ton	Turn-on Time	IF = 10 mA, Vo = 5 V, PW ≥ 10 ms	ms		0.3	1.0
		toff	Turn-off Time		ms		0.04	0.2
		RI-O	Isolation Resistance	VI-O = 1.0 kV	Ω	10 ⁹		
		CI-O	Isolation Capacitance	V = 0 V, f = 1 MHz	pF		1.1	
Photocoupler	Diode	VF	Forward Voltage	IF = 10 mA	V		1.2	1.4
		IR	Reverse Current ¹	VR = 5 V	μA			5.0
	Transistor	ICEO	Collector to Emitter Dark Current	VCE = 40 V, IF = 0 mA	nA			100
		BVCEO	Collector to Emitter Breakdown Voltage	IC = 1 mA	V	40		
	Coupler	BVECO	Emitter to Collector Breakdown Voltage	IE = 100 μA	V	6		
		CTR	Current Transfer Ratio	IF = 5 mA, VCE = 5 V	%	50		400
		VCE(sat)	Collector Saturation Voltage	IF = 10 mA, IC = 2 mA	V			0.3
		RI-O	Isolation Resistance	Vin-out = 1.0 kVcc	Ω	10 ¹¹		
		CI-O	Isolation Capacitance	V = 0 V, f = 1 MHz	pF		0.4	
		tR	Rise Time	Vcc = 5 V, IC = 2 mA	μs		3.0	
		tF	Fall Time	RL = 100 Ω	μs		5.0	

Note:

1. PS7241-AT1 only.

ABSOLUTE MAXIMUM RATINGS¹ ($T_A = 25^\circ\text{C}$)

	SYMBOLS	PARAMETERS	UNITS	RATINGS
OCMOS	Diode			
	I_F	Forward Current (DC)	mA	50
	V_R	Reverse Voltage	V	5.0
	P_D	Power Dissipation	mW/ch	50
	I_{FP}	Peak Forward Current ²	A	1.0
	MOSFET			
	V_L	Break Down Voltage	V	400
	I_L	Continuous Load Current	mA	120
	I_{LP}	Pulse Load Current ³ (AC/DC Connection)	mA	250
	P_D	Power Dissipation	mW	430
Photocoupler	Diode			
	I_F	Forward Current	mA	50
	V_R	Reverse Voltage ⁴	V	5.0
	P_D	Power Dissipation	mW/ch	50
	I_{FP}	Peak Forward Current ²	A	1.0
	Transistor			
	V_{CEO}	Collector to Emitter Voltage	V	40
	V_{ECO}	Emitter to Collector Voltage	V	6.0
	I_C	Collector Current	mA	80
	P_C	Power Dissipation	mW	100
	BV	Isolation Voltage ⁵	Vr.m.s.	1500
	P_T	Total Power Dissipation	mW	630
	T_A	Operating Ambient Temp.	$^\circ\text{C}$	-40 to 80
	T_{STG}	Storage Temperature	$^\circ\text{C}$	-40 to 100

Notes:

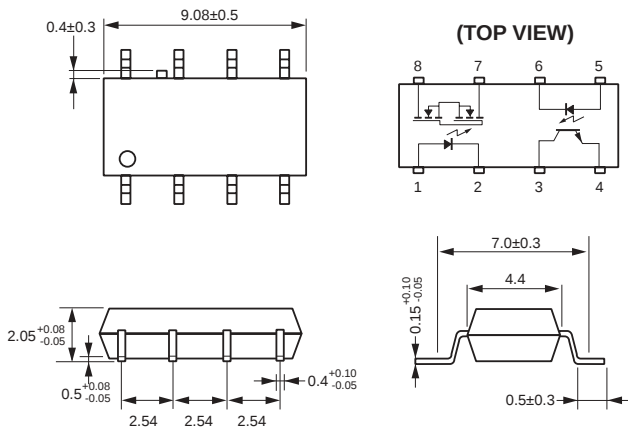
1. Operation in excess of any one of these parameters may result in permanent damage.
2. $PW = 100\ \mu\text{s}$, Duty Cycle = 1%.
3. $PW = 100\ \text{ms}$, 1 shot.
4. PS7241-AT1 only.
5. AC voltage for 1 minute at $T_A = 25^\circ\text{C}$, RH = 60 % between input and output.

RECOMMENDED**OPERATING CONDITIONS** ($T_A = 25^\circ\text{C}$)

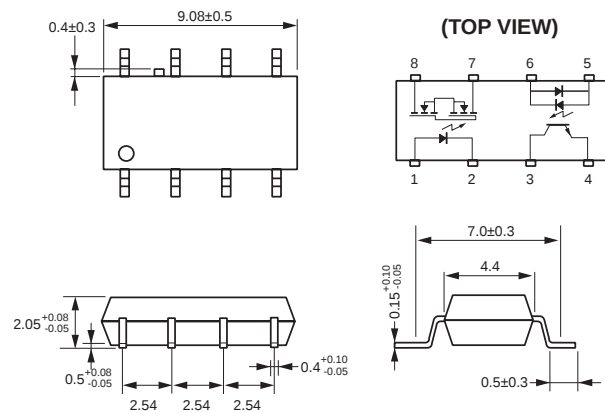
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
OCMOS FET					
I_F	LED Operating Current	mA	2	10	20
V_F	LED Off Voltage	V	0		0.5

ORDERING INFORMATION

PART NUMBER	PACKAGE	PACKING STYLE
PS7241-AT1	8-pin SOP	Magazine case 45 pcs
PS7241-AT1-F3		Embossed Tape 1500 pcs/reel
PS7241-AT1-F4		
PS7241-AT5		Magazine case 45 pcs
PS7241-AT5-F3		Embossed Tape 1500 pcs/reel
PS7241-AT5-F4		

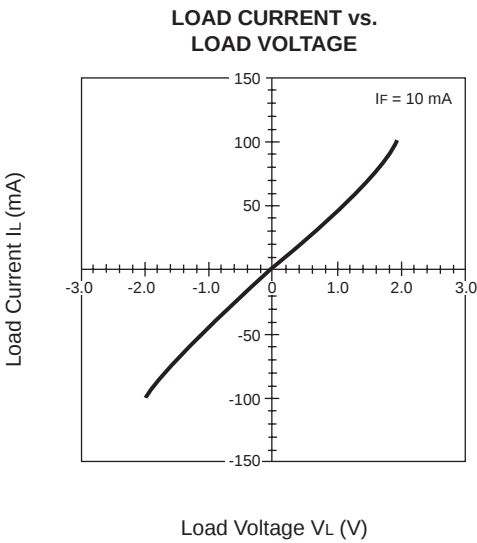
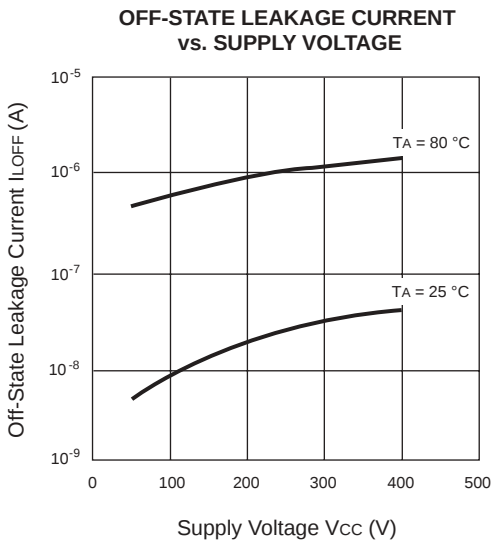
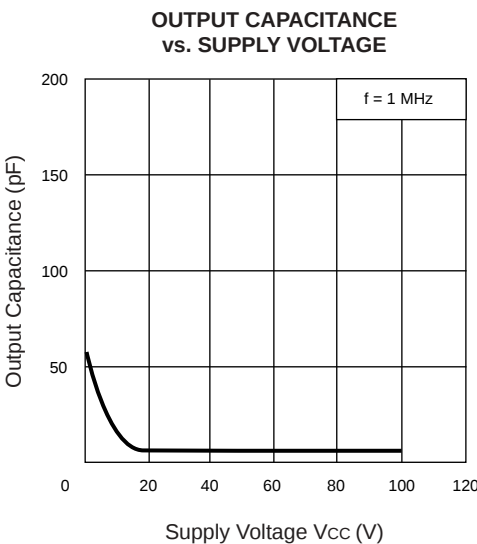
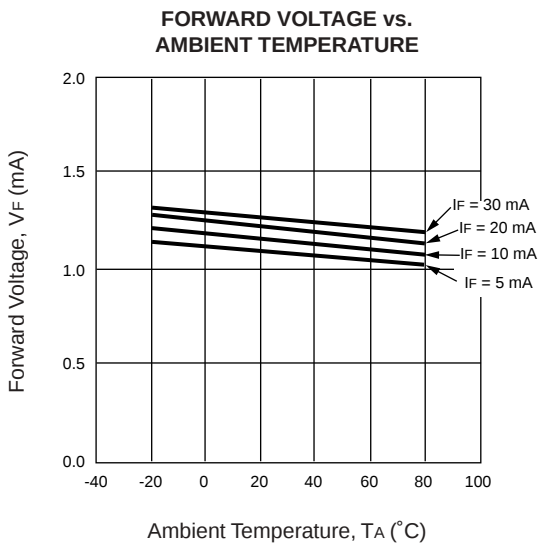
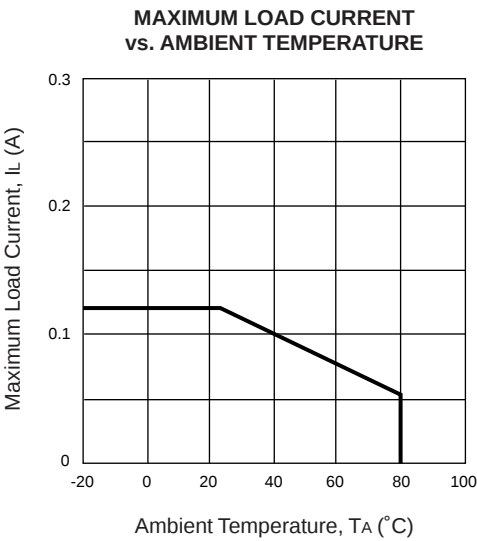
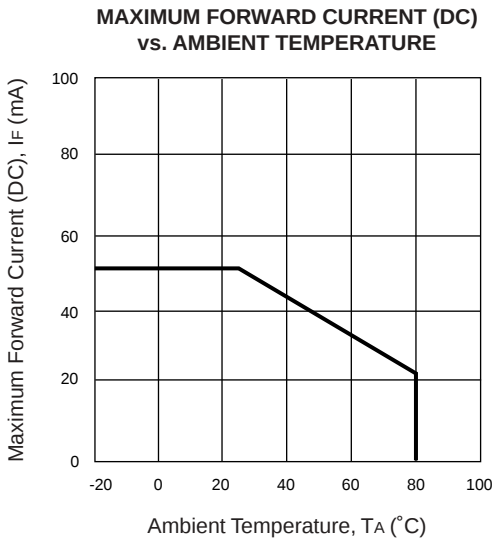
OUTLINE DIMENSIONS (Units in mm)**PS7241-AT1**

- 1 LED Anode
- 2 LED Cathode
- 3 Tr Collector
- 4 Tr Emitter
- 5 LED Anode
- 6 LED Cathode
- 7 MOSFET
- 8 MOSFET

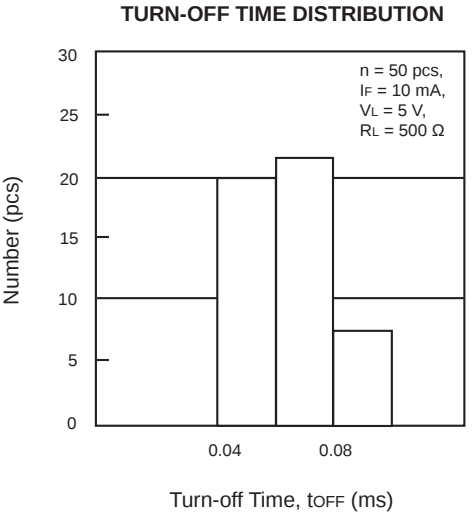
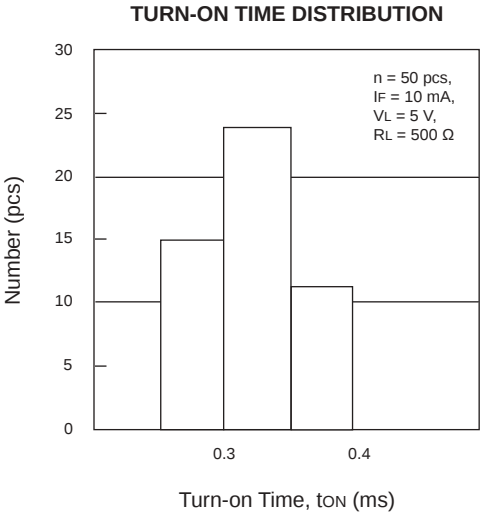
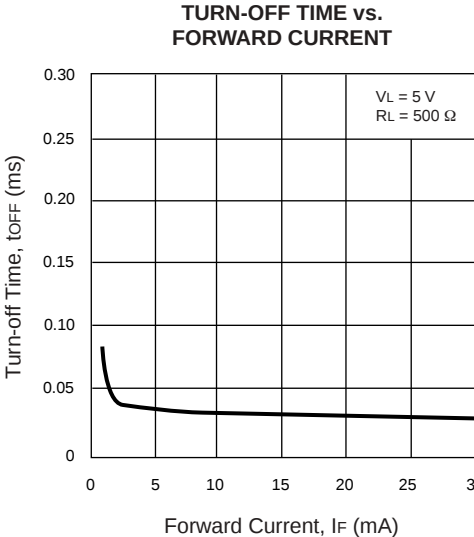
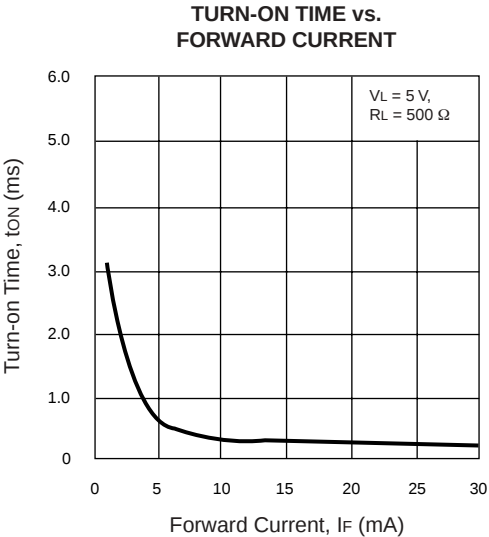
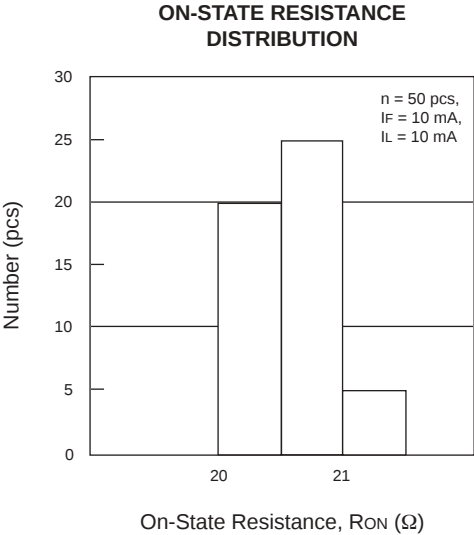
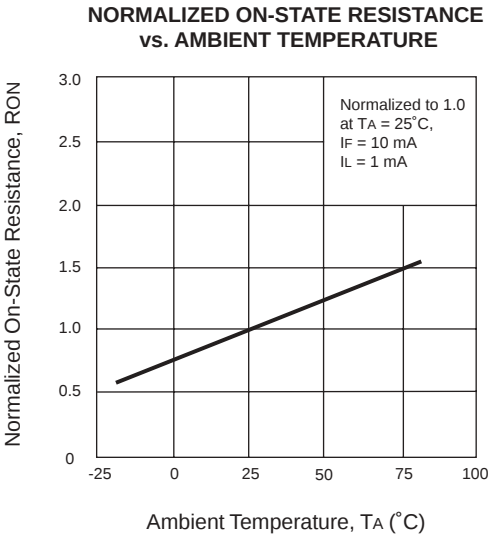
PS7241-AT5

- 1 LED Anode
- 2 LED Cathode
- 3 Tr Collector
- 4 Tr Emitter
- 5 LED Anode/Cathode
- 6 LED Cathode/Anode
- 7 MOSFET
- 8 MOSFET

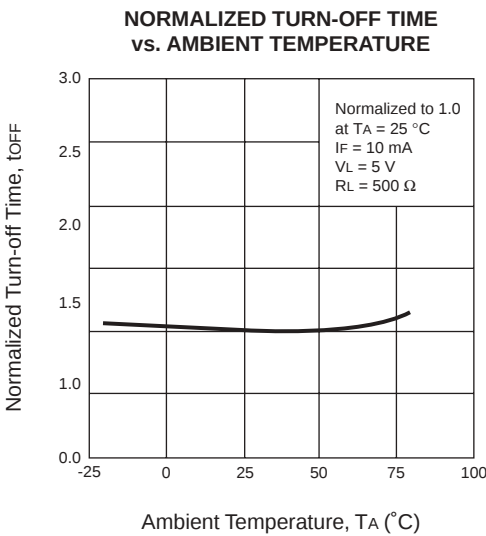
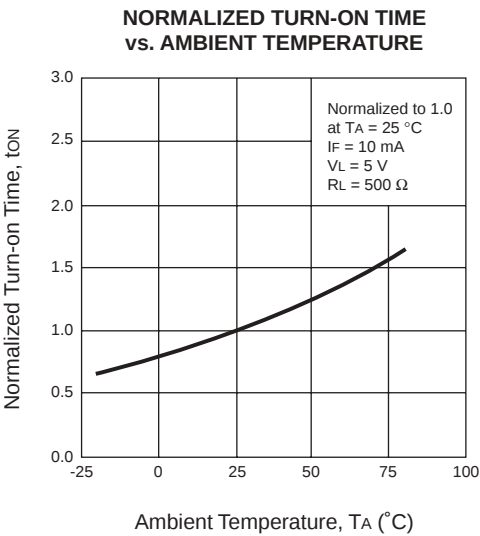
OCMOS TYPICAL PERFORMANCE CURVES (T_A = 25°C)



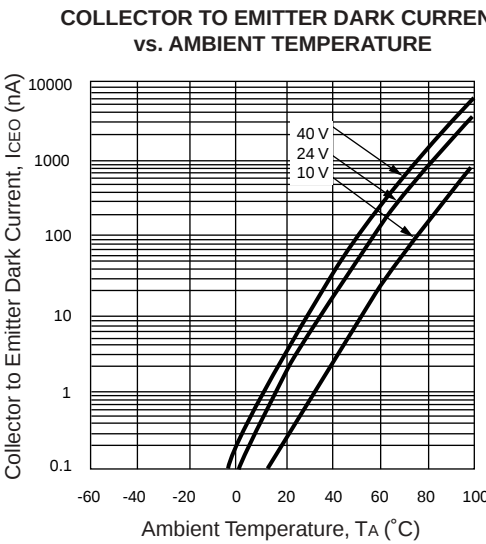
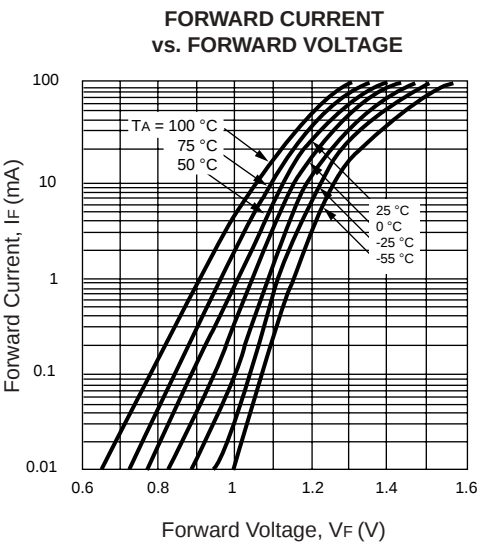
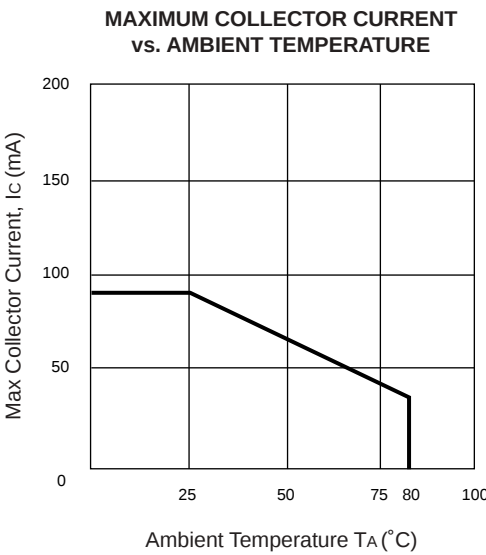
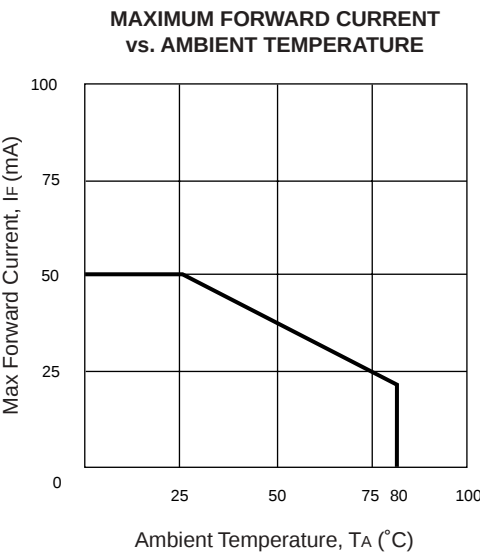
OCMOS TYPICAL PERFORMANCE CURVES (TA = 25°C)



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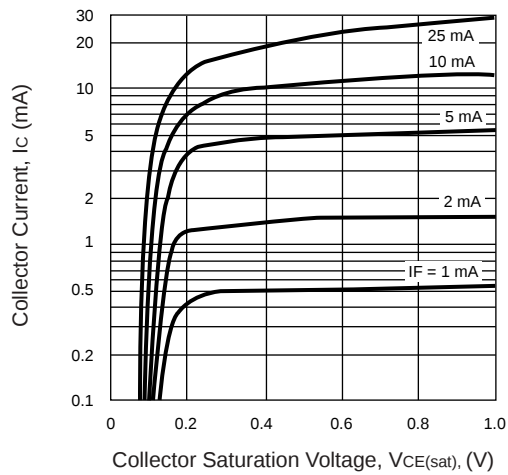


PHOTOCOUPLER TYPICAL PERFORMANCE CURVES (TA = 25°C)

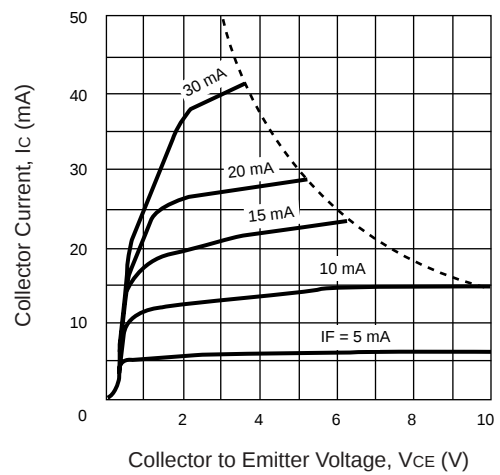


PHOTOCOUPLER TYPICAL PERFORMANCE CURVES (TA = 25°C)

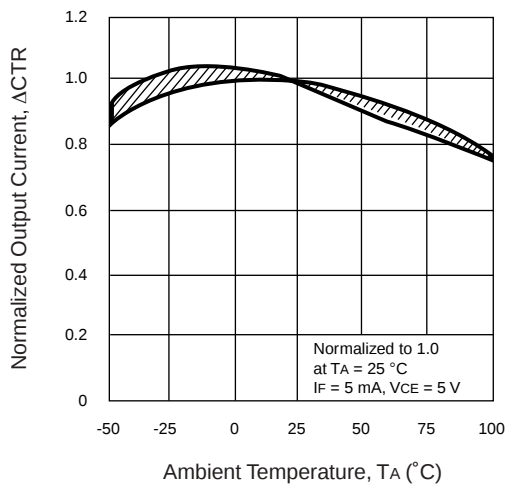
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



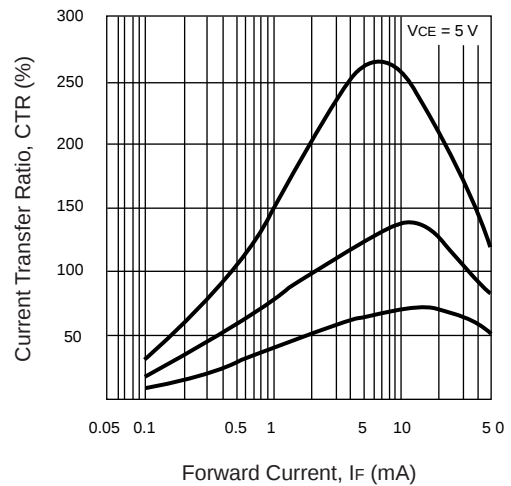
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



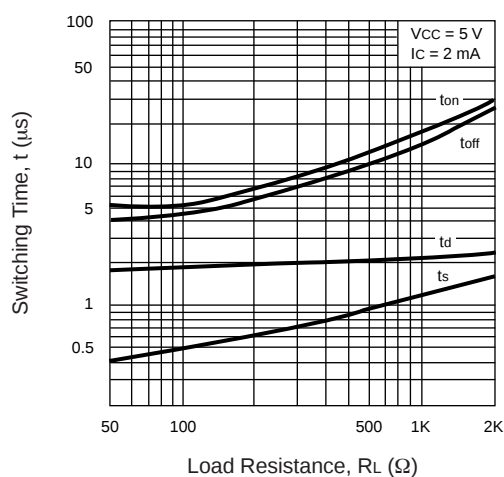
NORMALIZED OUTPUT CURRENT vs. AMBIENT TEMPERATURE



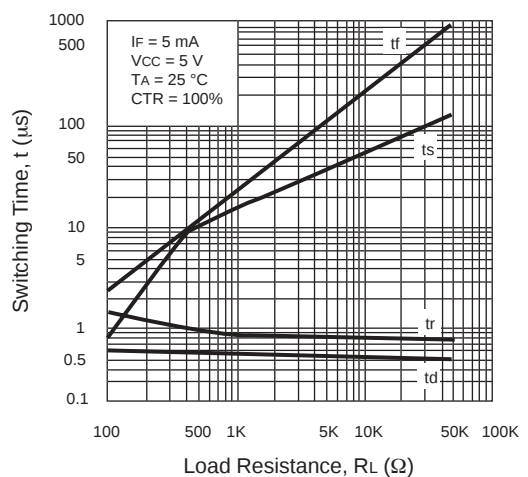
CURRENT TRANSFER RATIO (CTR) vs. FORWARD CURRENT



SWITCHING TIME vs. LOAD RESISTANCE

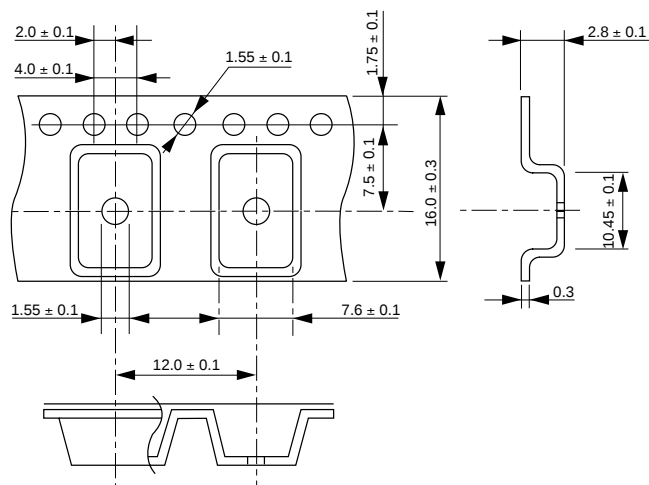


SWITCHING TIME vs. LOAD RESISTANCE

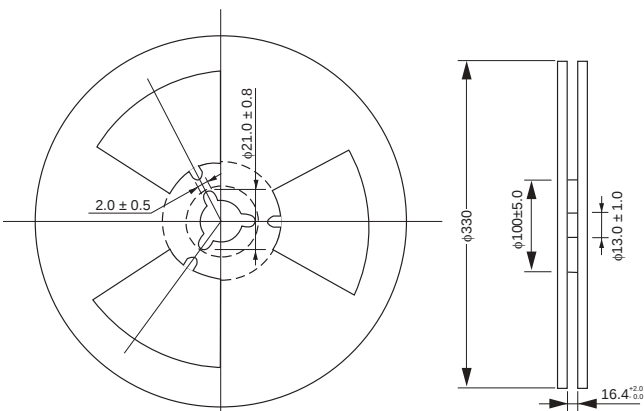


TAPING SPECIFICATIONS (Units in mm)

OUTLINE AND DIMENSIONS (TAPE)



OUTLINE AND DIMENSIONS (REEL)

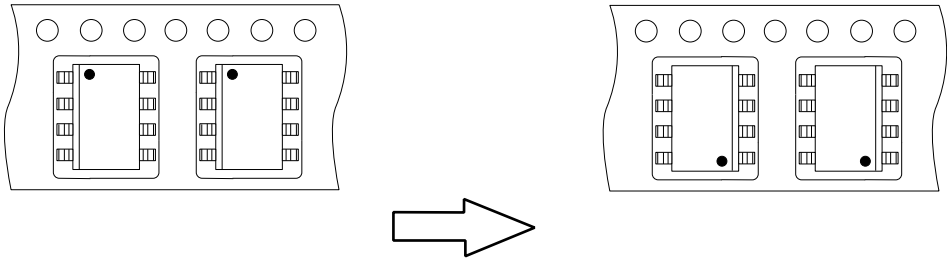


Notes:
1. Packaging : 1500 pcs/reel

TAPING DIRECTION

PS7241-AT1-F3
PS7241-AT5-F3

PS7241-AT1-F4
PS7241-AT5-F4

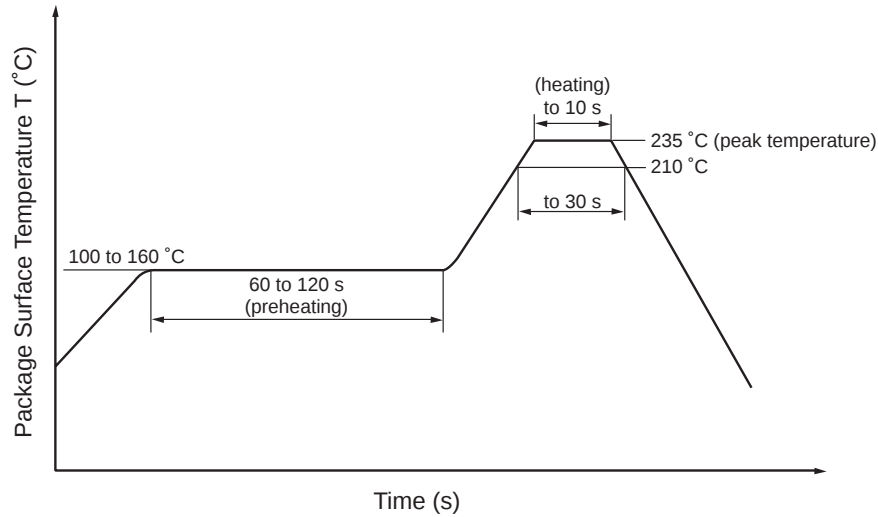


RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

- Peak reflow temperature 235 °C or below (package surface temperature)
- Time of temperature higher than 210 °C 30 seconds or less
- Number of reflows 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

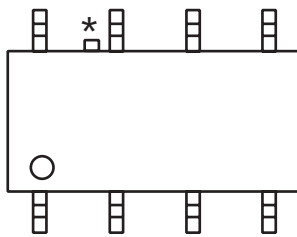


(2) Dip soldering

- Temperature 260 °C or below (molten solder temperature)
- Time 10 seconds or less
- Number of times One
- Flux Rosin flux containing small amount of chlorine
(The flux with a maximum chlorine content of 0.2 Wt % is recommended.)

(3) Cautions

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



* Portion of frame

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