PRELIMINARY DATA SHEET

NEC

OCMOS FET™

PS7241C-AT1,PS7241C-AT5

CURRENT LIMIT TYPE
8-PIN SOP OCMOS FET
(2-ch OCMOS FET)

DESCRIPTION

The 7241C-AT1 and PS7241C-AT5 are solid state relays containing a GaAs LED on the light emitting side (input side), MOS FETs, Photo transistor and current control circuit on the output side. Current control circuit of OCMOS FET protects this device from thermal breakdown and output circuit.

They are suitable for analog signal control because of their low offset and high linearity.

FEATURES

- 2 channel type (OCMOS FET + Photocoupler)
- Limit current (I_{LMT} = 125 to 180 mA)
- Low LED operating current (I_F = 2 mA)
- Designed for AC/DC switching line changer
- Small and thin package (8-pin SOP)
- Isolation voltage (BV = 1 500 Vr.m.s.)
- Low offset voltage
- Ordering number of taping product: PS7241C-AT1-F3, F4, PS7241C-AT5-F3, F4

APPLICATIONS

- Exchange equipment
- Measurement equipment
- FA/OA equipment

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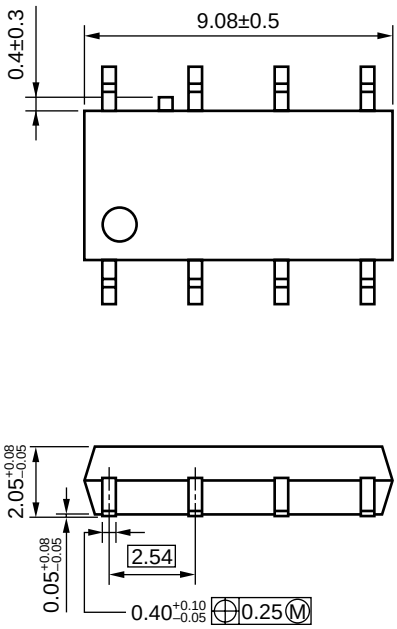
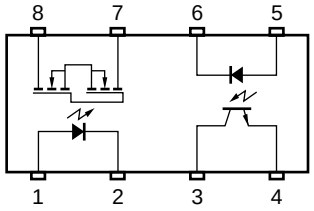
The mark ★ shows major revised points.

★ **PACKAGE DIMENSIONS (in millimeters)**

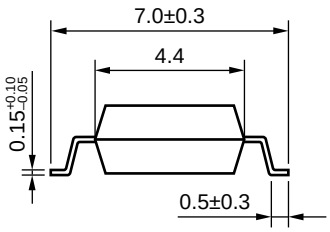
PS7241C-AT1



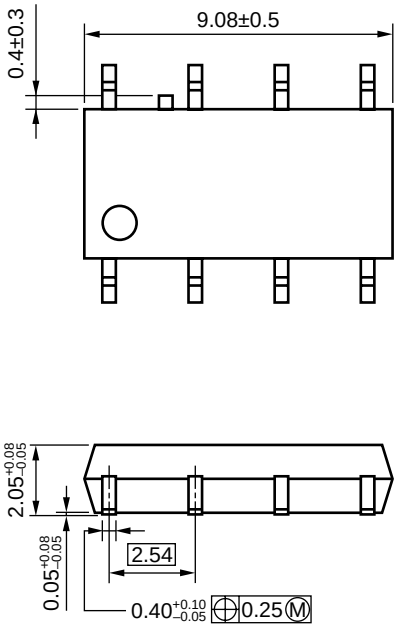
TOP VIEW



1. LED Anode
2. LED Cathode
3. Tr Collector
4. Tr Emitter
5. LED Anode
6. LED Cathode
7. MOS FET
8. MOS FET



PS7241C-AT5



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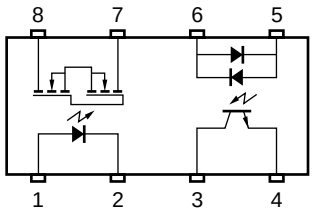
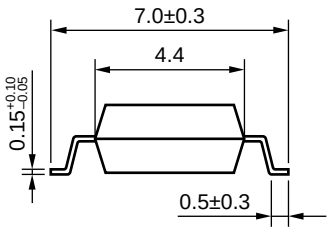


1. LED Anode
2. LED Cathode
3. Tr Collector
4. Tr Emitter
5. LED Anode/Cathode
6. LED Cathode/Anode
7. MOS FET
8. MOS FET



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise specified)

Parameter			Symbol	Ratings	Unit
OCMOS FET	Diode	Forward Current (DC)	I_F	50	mA
		Reverse Voltage	V_R	5.0	V
		Power Dissipation	P_D	50	mW
		Peak Forward Current *1	I_{FP}	1	A
	MOS FET	Break Down Voltage	V_L	400	V
		Continuous Load Current	I_L	120	mA
		Power Dissipation	P_D	430	mW
Photocoupler	Diode	Forward Current	I_F	50	mA
		Reverse Voltage *2	V_R	5.0	V
		Power Dissipation	P_D	50	mW
		Peak Forward Current *1	I_{FP}	1	A
	Transistor	Collector to Emitter Voltage	V_{CEO}	40	V
		Emitter to Collector Voltage	V_{ECO}	6	V
		Collector Current	I_C	80	mA
		Power Dissipation	P_C	100	mW
Isolation Voltage *3			BV	1 500	Vr.m.s.
Total Power Dissipation			P_T	630	mW
Operating Ambient Temperature			T_A	–40 to +80	°C
Storage Temperature			T_{stg}	–40 to +100	°C

***1** PW = 100 μs, Duty Cycle = 1 %

***2** PS7241C-AT1 only

***3** AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output

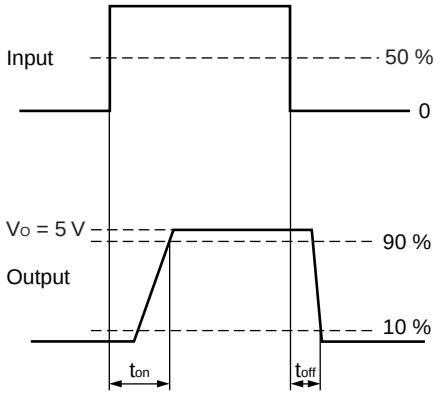
RECOMMENDED OPERATING CONDITIONS (T_A = 25 °C)

Parameter		Symbol	MIN.	TYP.	MAX.	Unit
OCMOS FET	LED Operating Current	I_F	2	20	30	mA
	LED Off Voltage	V_F	0		0.5	V
Photocoupler	LED Operating Current	I_F	2	5	20	mA

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
OCMOS FET	Diode	Forward Voltage	V_F	I_F = 10 mA		1.2	1.4	V
		Reverse Current	I_R	V_R = 5 V			5.0	μA
	MOS FET	Off-state Leakage Current	I_{Loff}	V_D = 400 V		0.03	1.0	μA
		Output Capacitance	C_{out}	V = 0 V, f = 1 MHz		65		pF
	Coupled	LED On-state Current	I_{Fon}	I_L = 120 mA			2.0	mA
		On-state Resistance	R_{on1}	I_F = 10 mA, I_L = 10 mA		28	35	Ω
			R_{on2}	I_F = 10 mA, I_L = 120 mA			30	
		Turn-on Time*1	t_{on}	I_F = 10 mA, V_O = 5 V,		0.5	1.0	ms
		Turn-off Time*1	t_{off}	PW ≥ 10 ms		0.08	1.0	
		Limit Current	I_{LMT}	I_F = 10 mA, V_L = 6 V, t = 5 ms	125	150	180	mA
		Isolation Resistance	R_{I-O}	V_{I-O} = 1.0 kV_{DC}	10^9			Ω
		Isolation Capacitance	C_{I-O}	V = 0 V, f = 1 MHz		0.4		pF
Photo-coupler	Diode	Forward Voltage	V_F	I_F = 10 mA		1.2	1.4	V
		Reverse Current*2	I_R	V_R = 5 V			5.0	μA
	Transistor	Collector to Emitter Dark Current	I_{CEO}	V_{CE} = 40 V, I_F = 0 mA			100	nA
		Collector to Emitter Breakdown Voltage	BV_{CEO}	I_C = 1 mA	40			V
		Emitter to Collector Breakdown Voltage	BV_{ECO}	I_E = 100 μA	6.0			
	Coupler	Current Transfer Ratio (I_C/I_F)	CTR	I_F = 5 mA, V_{CE} = 5 V	50	200	400	%
		Collector Saturation Voltage	$V_{CE (sat)}$	I_F = 10 mA, I_C = 2 mA			0.3	V
		Isolation Resistance	R_{I-O}	V_{I-O} = 1.0 kV_{DC}	10^{11}			Ω
		Isolation Capacitance	C_{I-O}	V = 0 V, f = 1 MHz		0.4		pF
		Rise Time	t_r	V_{CC} = 5V, I_C = 2 mA,		3.0		μs
		Fall Time	t_f	RL = 100 Ω		5.0		

***1** Turn-on, Turn-off time



***2** PS7241C-AT1 only

[MEMO]

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CAUTION

Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.

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