PRELIMINARY DATA SHEET

NEC

OCMOS FET™

PS7841-A15

FOR OPTICAL DAA
16-PIN SOP OCMOS FET

DESCRIPTION

The PS7841-A15 is a solid state relay for optical DAA (Data Access Arrangement) containing a diode bridge, MOS FET, photocoupler, Darlington transistor and LED.

This device is suitable for analog signal control applications such as notebook PCs, modem cards, voice telephony and fax machines.

FEATURES

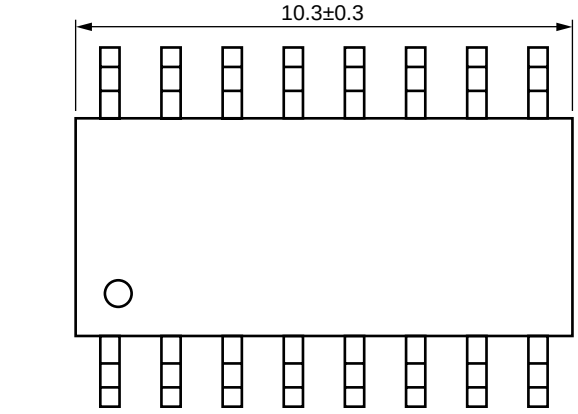
- For optical DAA circuit
    - OCMOS FET
    - Photocoupler (AC input response)
    - Diode bridge
    - Darlington transistor
- Small and thin package (16-pin SOP: 255 mil, Pin pitch = 1.27 mm, Height = 2.1 mm)
- High isolation voltage (BV = 1 500 Vr.m.s.)
- Ordering number of taping product: PS7841-A15-F3, F4

APPLICATIONS

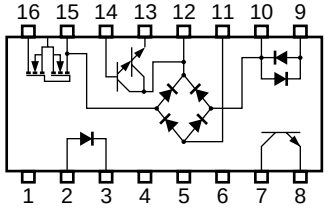
- Notebook PC, PDA
- Modem card
- Telephone, FAX

Document No. P13617EJ1V0DS00 (1st edition)
Date Published June 1998 NS CP(K)
Printed in Japan

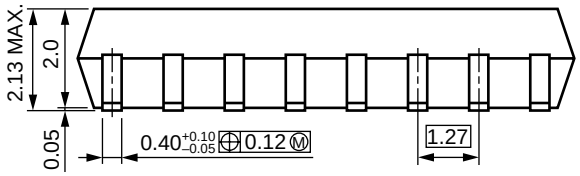
PACKAGE DIMENSIONS
in millimeters

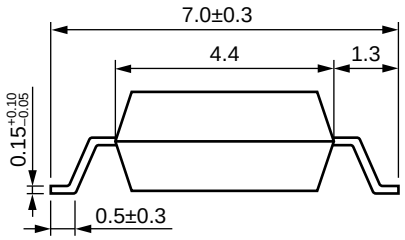


TOP VIEW



1. NC	9. LED Anode, Cathode
2. LED Anode	10. LED Cathode, Anode
3. LED Cathode	11. Di. Input
4. NC	12. Di. Output
5. NC	13. Tr. Emitter (Darlington)
6. NC	14. Tr. Base (Darlington)
7. Tr. Collector	15. MOS FET
8. Tr. Emitter	16. MOS FET





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

Parameter			Symbol	Ratings	Unit
OCMOS FET (Pin No. 2, 3, 15, 16)	Diode	Forward Current	I_F	50	mA
		Reverse Voltage	V_R	5.0	V
		Power Dissipation	P_D	50	mW/ch
		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_C	430	mW/ch
Photocoupler (Pin No. 7, 8, 9, 10)	Diode	Forward Current	I_F	50	mA
		Power Dissipation	P_D	50	mW/ch
		Peak Forward Current *1	I_{FP}	1	A
	Transistor	Collector to Emitter Voltage	V_{CEO}	40	V
		Collector Current	I_C	80	mA
		Power Dissipation	P_C	50	mW/ch
Diode Bridge (Pin No. 10, 11, 12, 16)	Forward Current		I_F	140	mA
	Reverse Voltage		V_R	100	V
Darlington Transistor (Pin No. 12, 13, 14)	Collector to Emitter Voltage		V_{CEO}	40	V
	Collector Current		I_C	120	mA
	Power Dissipation		P_C	500	mW/ch
Isolation Voltage *2			BV	1 500	Vr.m.s.
Total Power Dissipation			P_T	650	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** 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	10	20	mA
	LED Off Voltage	V_F	0		0.5	V

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

OCMOS FET (Pin No. 2, 3, 15, 16)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 10 mA		1.2	1.4	V
MOS FET	Off-state Leakage Current	I_{off}	V_L = 400 V, I_F = 0 mA			1.0	μA
Coupled	On-state Resistance	R_{on}	I_F = 10 mA, I_L = 10 mA		20	30	Ω
			I_F = 10 mA, I_L = 120 mA		16	25	
	Turn-on Time	t_{on}	I_F = 10 mA, V_L = 5 V, RL = 500 Ω,		0.3	1.0	ms
	Turn-off Time	t_{off}	PW ≥ 10 ms		0.04	0.2	
Isolation Resistance		R_{I-O}	V_{I-O} = 500 V_{DC}	10^9			Ω
Isolation Capacitance		C_{I-O}	V = 0 V, f = 1 MHz		1.1		pF

PHOTOCOUPLER (Pin No. 7, 8, 9, 10)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 10 mA		1.2	1.4	V
Transistor	Collector to Emitter Dark Current	I_{CEO}	V_{CE} = 40 V, I_F = 0 mA			0.1	μA
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		0.1	0.3	V
	Rise Time	t_r	V_{CC} = 5 V, I_C = 2 mA, RL = 100 Ω		3.0		μs
	Fall Time	t_f			5.0		
Isolation Resistance		R_{I-O}	V_{I-O} = 500 V_{DC}	10^{11}			Ω
Isolation Capacitance		C_{I-O}	V = 0 V, f = 1 MHz		0.4		pF

DIODE BRIDGE (Pin No. 10, 11, 12, 15)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Forward Voltage	V_F	I_F = 120 mA		0.9	1.2	V
Reverse Current	I_R	V_R = 100 V			10	μA

DARLINGTON TRANSISTOR (Pin No. 12, 13, 14)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector Saturation Voltage	$V_{CE (sat)}$	I_C = 120 mA, I_B = 100 μA		0.9	1.2	V
Collector to Emitter Dark Current	I_{CEX}	I_B = 0 mA, V_{CE} = 30 V		0.01	1.0	μA
DC Current Gain	h_{FE}	I_C = 120 mA, V_{CE} = 10 V		10 000	30 000	

[MEMO]

[MEMO]

[MEMO]

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.

OCMOS FET is a trademark of NEC Corporation.

M4 96.5