

PHOTOCOUPLER PS2711-1

HIGH CTR 4-PIN SOP PHOTOCOUPLER

-NEPOC[™] Series-

DESCRIPTION

The PS2711-1 is an optically coupled isolator containing a GaAs light emitting diode and an NPN silicon phototransistor in a plastic SOP for high density applications.

The package is an SOP (Small Outline Package) type for high density mounting applications.

FEATURES

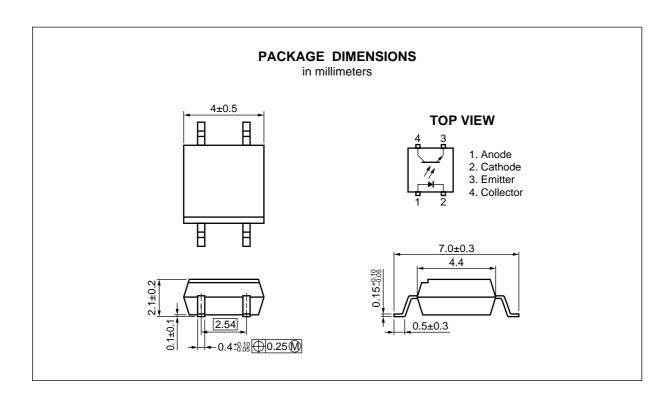
- High current transfer ratio (CTR = 200 % TYP. @ IF = 1mA)
- High isolation voltage (BV = 3 750 Vr.m.s.)
- Small and thin package (4-pin SOP)
- Ordering number of tape product: PS2711-1-F3, F4
- UL approved: File No. E72422 (S)

APPLICATIONS

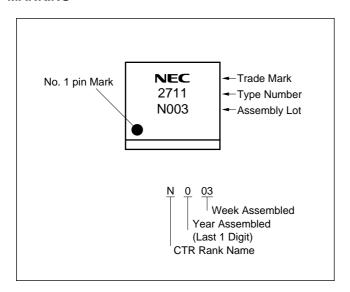
- Programmable logic controllers
- Small power supply
- Hybrid IC
- Modem/FAX

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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.



MARKING





ORDERING INFORMATION

Part Number	Package	Packing Style	Safety Standards Approval	Application Part Number*1	
PS2711-1	4-pin SOP	50 pcs (Tape 50 pcs cut)	UL approved	PS2711-1	
PS2711-1-F3		Embossed Tape 3 500 pcs/reel			
PS2711-1-F4					

^{*1} For the application of the Safety Standard, following part number should be used.

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

Parameter		Symbol	Ratings	Unit
Diode	Forward Current (DC)	lF	50	mA
	Reverse Voltage	VR	6	V
	Power Dissipation Derating	∆P₀/°C	0.8	mW/°C
	Power Dissipation	Po	80	mW
	Peak Forward Current ^{*1}	I FP	0.5	Α
Transistor	Collector to Emitter Voltage	Vceo	40	V
	Emitter to Collector Voltage	Veco	5	V
	Collector Current	lc	40	mA
	Power Dissipation Derating	∆Pc/°C	1.5	mW/°C
	Power Dissipation	Pc	150	mW
Isolation Voltage ²		BV	3 750	Vr.m.s.
Operating Ambient Temperature		TA	-55 to +100	°C
Storage Temperature		T _{stg}	-55 to +150	°C

^{*1} PW = 100 μ s, Duty Cycle = 1 %

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^{*2} AC voltage for 1 minute at $T_A = 25$ °C, RH = 60 % between input and output



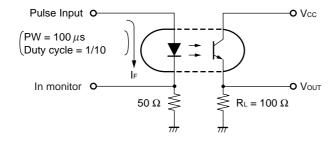
ELECTRICAL CHARACTERISTICS (TA = 25 °C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	VF	I _F = 5 mA		1.15	1.4	V
	Reverse Current	lr	V _R = 5 V			5	μΑ
	Terminal Capacitance	Ct	V = 0 V, f = 1 MHz		30		pF
Transistor	Collector to Emitter Dark Current	ICEO	IF = 0 mA, VcE = 40 V			100	nA
Coupled	Current Transfer Ratio	CTR	IF = 1 mA, VcE = 5 V	100	200	400	%
	Collector Saturation Voltage	VCE (sat)	IF = 1 mA, Ic = 0.2 mA			0.3	V
	Isolation Resistance	R _{I-O}	Vi-o = 1 kVDC	10 ¹¹			Ω
	Isolation Capacitance	C _{I-O}	V = 0 V, f = 1 MHz		0.4		pF
	Rise Time*2	tr	$Vcc = 5 \text{ V}, \text{ Ic} = 2 \text{ mA}, \text{ RL} = 100 \Omega$		4		μs
	Fall Time*2	tf			5		

*1 CTR rank

N: 100 to 400 (%) K: 200 to 400 (%) L: 150 to 300 (%) M: 100 to 200 (%)

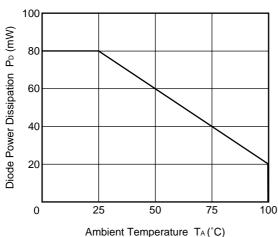
*2 Test circuit for switching time



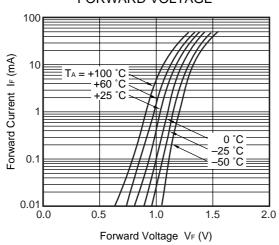


TYPICAL CHARACTERISTICS (TA = 25 °C, unless otherwise specified)

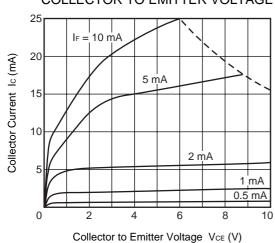




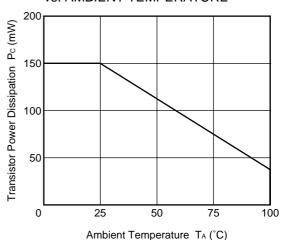
FORWARD CURRENT vs. FORWARD VOLTAGE



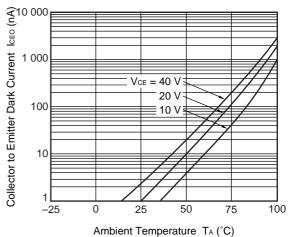
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



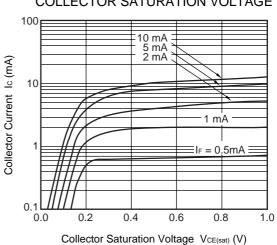
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE

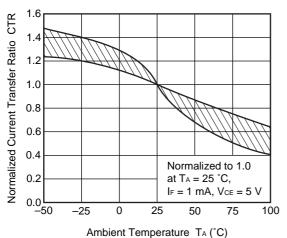


COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE

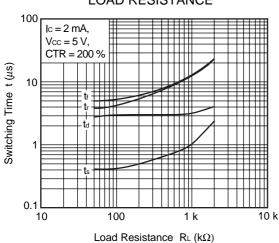




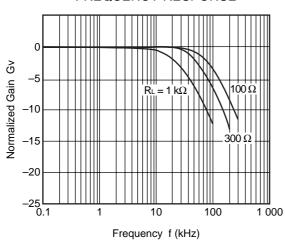
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



SWITCHING TIME vs. LOAD RESISTANCE

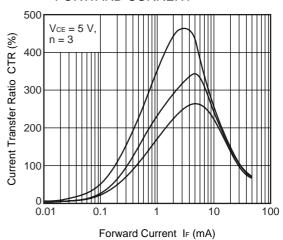


FREQUENCY RESPONSE

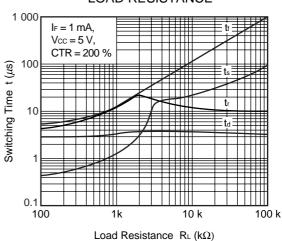


Remark The graphs indicate nominal characteristics.

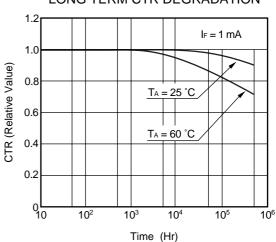
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



SWITCHING TIME vs. LOAD RESISTANCE

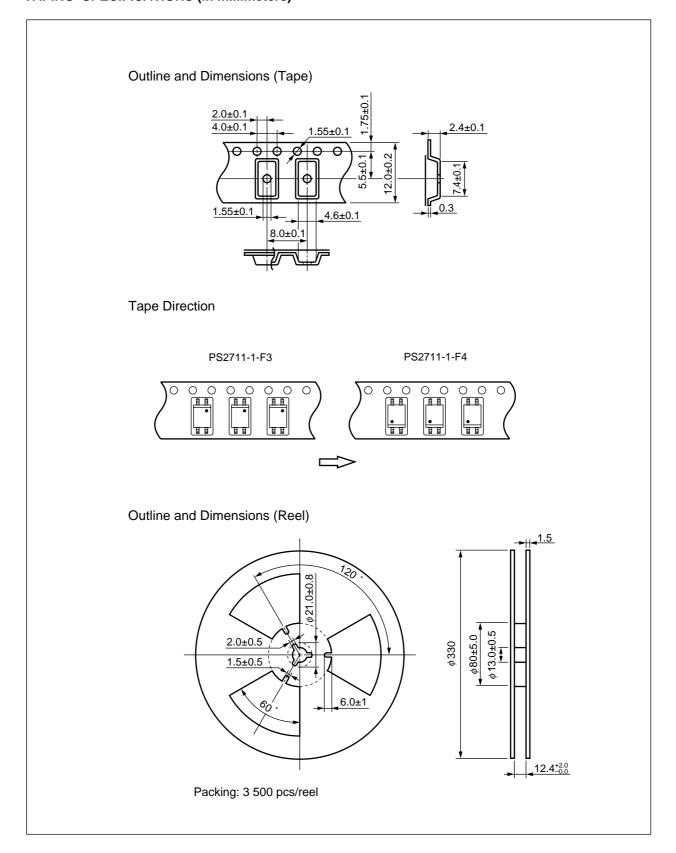


LONG TERM CTR DEGRADATION





TAPING SPECIFICATIONS (in millimeters)



NOTES ON HANDLING

1. Recommended soldering conditions

(1) Infrared reflow soldering

Peak reflow temperature
 235 °C or below (package surface temperature)

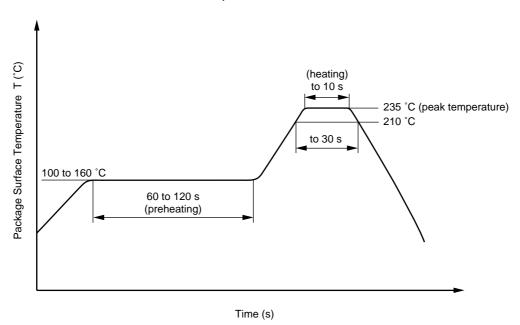
• Time of temperature higher than 210 °C 30 seconds or less

Number of reflows
 Three

• 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 (Allowed to be dipped in solder including plastic mold portion.)

• 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 and chlorine-based cleaning solvent.

2. Cautions regarding noise

Be aware that when voltage is applied suddenly between the photocoupler's input and output or between corrector-emitters at startup, the output side may enter the on state, even if the voltage is within the absolute maximum ratings.

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NEC PS2711-1

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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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