

NEC's SINGLE TR. OUTPUT, HIGH COLLECTOR-EMITTER VOLTAGE, 4-PIN ULTRA SMALL FLAT LEAD **OPTOCOUPLER**

PS2913-1

FEATURES

- **ULTRA SMALL FLAT LEAD PACKAGE:** 4.6 (L) x 2.5 (W) x 2.1 (H) mm
- **ISOLATION DISTANCE:** 0.4 mm MIN
- HIGH COLLECTOR TO EMITTER VOLTAGE: VCEO = 120 V
- HIGH ISOLATION VOLTAGE BV = 2500 Vr.m.s.
- **AVAILABLE IN TAPE AND REEL:** PS2913-1-F3, F4: 3500 pcs/reel

DESCRIPTION

NEC's PS2913-1 is an optically coupled isolator containing a GaAs light emitting diode and an NPN silicon phototransistor is one package for high density mounting applications. This device is housed in an ultra small flat-lead package which realizes a reduction in mounting area of about 30% compared with the PS28XX series.

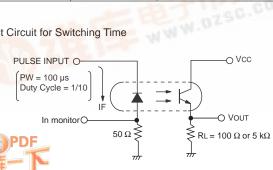
APPLICATIONS

- HYBRID IC
- POWER SUPPLY

ELECTRICAL CHARACTERISTICS (TA = 25°C)

PART NUMBER						PS2913-1		
SYMBOLS		PARAMETERS		UNITS	MIN	TYP	MAX	
Diode	VF	Forward Voltage, IF = 1 mA		V	0.9	1,15C-	1.3	
	IR	Reverse Current, VR = 5 V		μΑ	E WW	All . W	5	
	Ст	Terminal Capacitance, V = 0, f = 1.0 MHz		pF		15		
Transistor	ICEO	Collector to Emi	tter Dark Current, IF = 1 mA, Vce = 120 V	nA			100	
	CTR	Current Transfer Ratio (Ic/IF), IF = 1 mA, VcE = 5 V		%	50	100	200	
	VCE(sat)	Collector Saturation Voltage, IF = 1 mA, Ic = 0.2 mA		V		0.13	0.3	
Coupled	RI-O	Isolation Resistance, Vi-o = 1.0 kVpc		Ω	10 ¹¹		red.	
Cou	Cı-o	Isolation Capacitance, V = 0 V, f = 1.0 MHz		pF		0.4	1177	
	tr	Rise Time ¹	$Vcc = 5 \text{ V, } Ic = 2 \text{ mA}, \text{ RL} = 100 \Omega$	μS	- CT-	10	COM	
	tf	Fall Time ¹		μs		10	47.9	
	ton	On Time ¹	$Vcc = 5 \text{ V, IF} = 1 \text{ mA}, \text{ RL} = 5 \text{ k}\Omega$	μS		80		
	ts	Storage Time ¹		μS		5		
	tF	Off Time ¹	一方的門	μS		50		

1. Test Circuit for Switching Time



ABSOLUTE MAXIMUM RATINGS¹ (TA = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS			
Diode	Diode					
lF	Forward Current (DC)	mA	50			
ΔIF/°C	Forward Current Derating	mA/°C	0.5			
IF (Peak)	Peak Forward Current ²	Α	0.5			
PD	Power Dissipation	mW	60			
VR	Reverse Voltage	V	6			
Transistor	Transistor					
VCEO	Collector to Emitter Voltage	V	120			
VECO	Emitter to Collector Voltage	V	6			
Ic	Collector Current	mA	30			
ΔPc/°C	Power Dissipation Derating	mW/°C	1.2			
Pc	Power Dissipation	mW	120			
Coupled						
Viso	Isolation Voltage ³	Vr.m.s.	2500			
Рт	Total Power Dissipation	mW	160			
TA	Operating Ambient Temp.	°C	-55 to +100			
TSTG Storage Temperature		°C	-55 to +150			

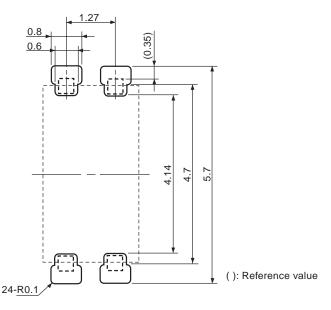
Notes:

- Operation in excess of any one of these parameters may result in permanent damage.
- 2. PW = 100 μ s, Duty Cycle = 1%.
- AC voltage for 1 minute at TA = 25°C, RH = 60% between input and output.

ORDERING INFORMATION

PART NUMBER	PACKING STYLE
PS2913-1-F3	Embossed Tape 3500 pcs/reel
PS2913-1-F4	

RECOMMENDED MOUNT PAD DIMENSIONS (Units in mm)



Remark:

This drawing is considered to meet air and outer creepage distance 4.0 minimum. All dimensions in this figure must be evaluated before

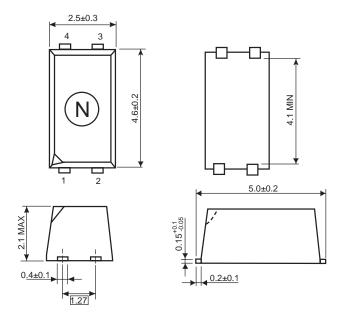
OPTOCOUPLER CONSTRUCTION

PARAMETER	UNITS (MIN)		
Air Distance	4 mm		
Creepage Distance	4 mm		
Isolation Distance	0.4 mm		

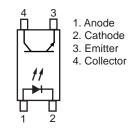
CAUTIONS REGARDING NOISE:

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

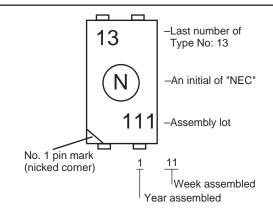
OUTLINE DIMENSIONS (Units in mm)



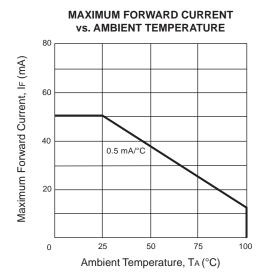
TOP VIEW

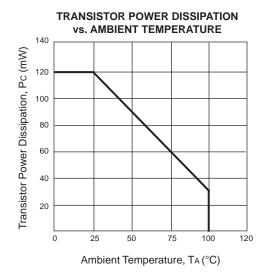


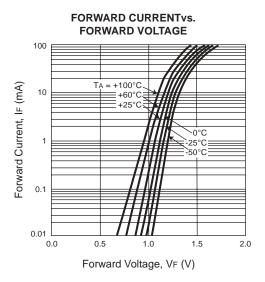
MARKING

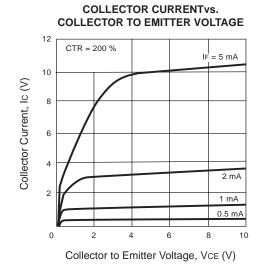


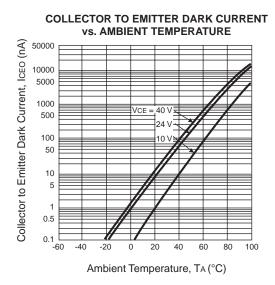
TYPICAL CHARACTERISTICS (TA = 25°C, unless otherwise specified)

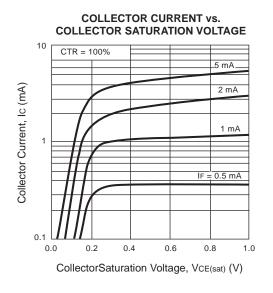






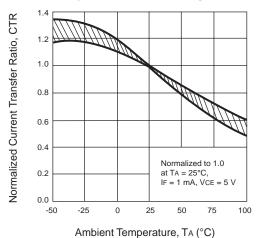




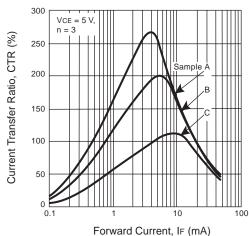


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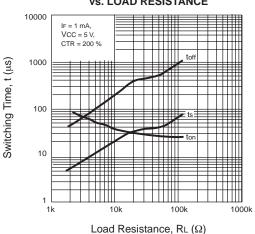




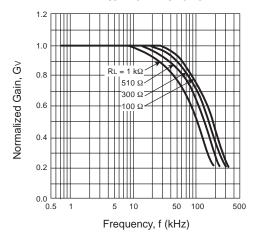
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



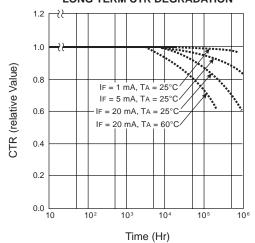
SWITCHING TIME vs. LOAD RESISTANCE



FREQUENCY RESPONSE



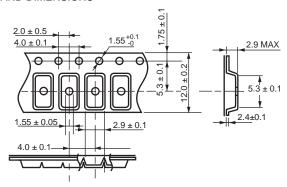
LONG TERM CTR DEGRADATION



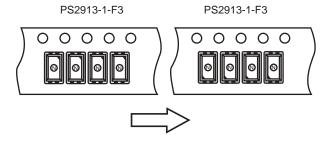
REMARK: The graphs indicate nominal characteristics.

TAPING SPECIFICATIONS (Units in mm)

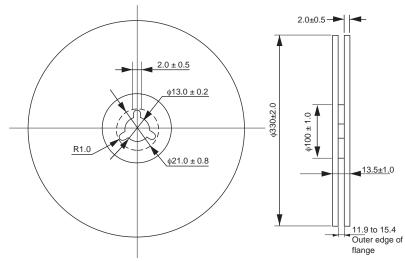
TAPE OUTLINE AND DIMENSIONS



TAPE DIRECTION



REEL OUTLINE AND DIMENSIONS



Packing: 3500 pcs/reel

RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

Peak reflow temperature
 260 °C or below (package surface temperature)

Time of peak reflow temperature
 Time of temperature higher than 220 °C
 60 seconds or less

Time to preheat temperature from 120 to 180°C 120±30 s

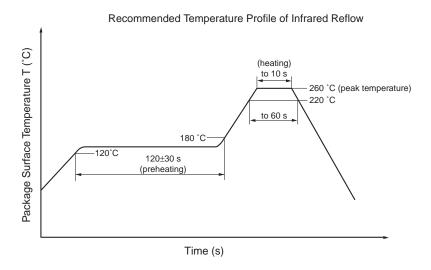
Number of reflows

Three

Flux
 Rosin flux containing small amount of chlorine (The flux

with a maximum chlorine content of 0.2 Wt % is

recommended).



(2) Wave soldering

• Temperature 260 °C or below (molten solder temperature)

Time 10 seconds or less

Preheating conditions 120°C or below (package surface temperature)

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 chlorine-based cleaning solvent after a reflow process.

USAGE CAUTIONS

- 1. Protect against static electricity when handling.
- 2. Avoid storage at a high temperature ad high humidity.

Life Support Applications

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