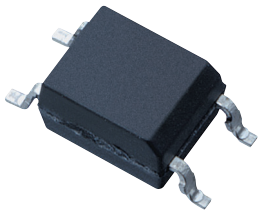
S2S3 Series

*Zero cross type is also available. (**S2S4 Series**)

V_{DRM} : 600V, Non-zero cross type
Mini-Flat Package
Phototriac Coupler for triggering



■ Description

S2S3 Series Phototriac Coupler include an infrared emitting diode (IRED) optically coupled to an output Phototriac.

These devices feature full wave control and are ideal isolated drivers for medium to high current Triacs.

SOP package provides 3.75kV isolation from input to output with superior commutative noise immunity.

■ Features

1. High repetitive peak off-state voltage (V_{DRM} : 600V)
2. Non-zero crossing functionality
3. I_{FT} ranks available (see Model Line-up section in this datasheet)
4. 4pin Mini-flat package
5. Superior noise immunity (dV/dt : MIN. 100V/μs)
6. Lead-free components are also available (see Model Line-up section in this datasheet)
7. Double transfer mold construction (Ideal for Flow Soldering)
8. High isolation voltage between input and output (V_{iso}(rms) : 3.75kV)

■ Agency approvals/Compliance

1. Recognized by UL1577 (Double protection isolation), file No. E64380 (as model No. **S2S3**)
2. Approved by CSA, file No. CA95323 (as model No. **S2S3**)
3. Optionary available VDE Approved (*)(DIN EN 60747-5-2), file No. 40009162 (as model No. **S2S3**)
4. Package resin : UL flammability grade (94V-0)

(*) DIN EN60747-5-2 : successor standard of DIN VDE0884.
Up to Date code "RD" (December 2003), approval of DIN VDE0884.
From Date code "S1" (January 2004), approval of DIN EN60747-5-2.

(**) Reinforced insulation type is also available.
(**PC3SG11YIZ Series**)

■ Applications

1. Triggering for Triacs used to switch on and off devices which require AC Loads.
   For example heaters, fans, motors, solenoids, and valves.
2. Triggering for Triacs used for implementing phase control in applications such as lighting control and temperature control (HVAC).
3. AC line control in power supply applications.

Notice The content of data sheet is subject to change without prior notice.
In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

Sheet No.: D2-A06501EN
Date Mar. 31. 2004
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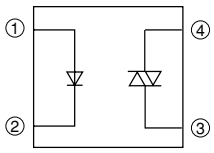
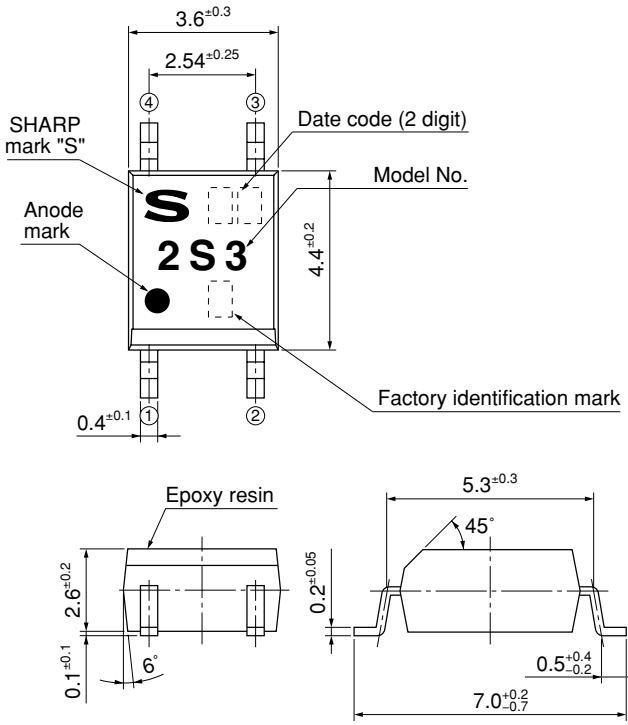
■ Internal Connection Diagram



① Anode
② Cathode
③ Anode/Cathode
④ Cathode/Anode

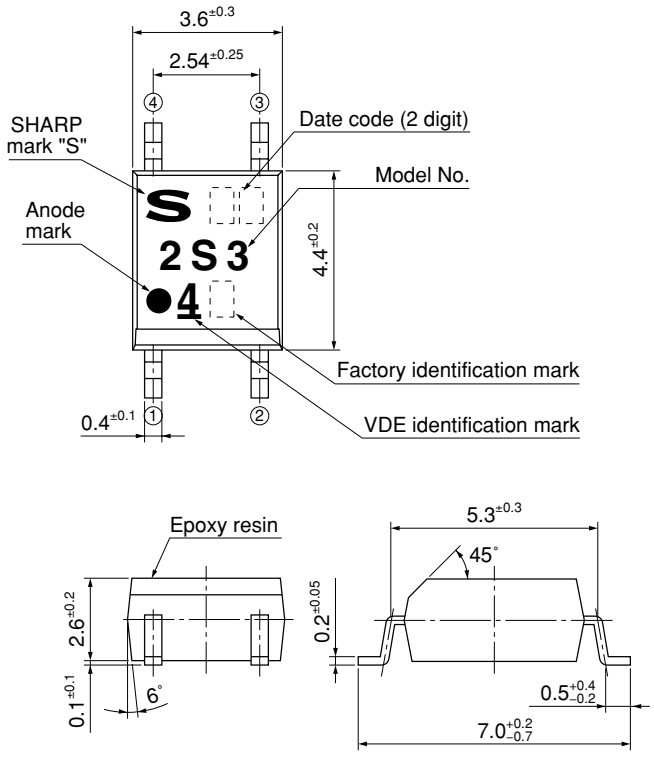
■ Outline Dimensions

(Unit : mm)



Product mass : approx. 0.09g

VDE option



Product mass : approx. 0.09g

Date code (2 digit)

1st digit				2nd digit	
Year of production				Month of production	
A.D.	Mark	A.D	Mark	Month	Mark
1990	A	2002	P	January	1
1991	B	2003	R	February	2
1992	C	2004	S	March	3
1993	D	2005	T	April	4
1994	E	2006	U	May	5
1995	F	2007	V	June	6
1996	H	2008	W	July	7
1997	J	2009	X	August	8
1998	K	2010	A	September	9
1999	L	2011	B	October	O
2000	M	2012	C	November	N
2001	N	⋮	⋮	December	D

repeats in a 20 year cycle

Factory identification mark

Factory identification Mark	Country of origin
no mark	Japan
■	
◢	Indonesia
▽	Philippines
◥	China

* This factory marking is for identification purpose only.
Please contact the local SHARP sales representative to see the actural status of the production.

Rank mark

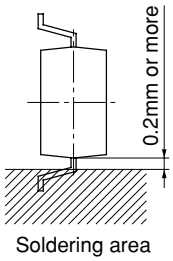
There is no rank mark indicator.

■ Absolute Maximum Ratings

(T_a=25˚C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	Reverse voltage	V_R	6	V
Output	RMS ON-state current	I_T(rms)	0.05	A
	Peak one cycle surge current	I_{surge}	0.6 *3	A
	Repetitive peak OFF-state voltage	V_{DRM}	600	V
*1 Isolation voltage		V_{iso}(rms)	3.75	kV
Operating temperature		T_{opr}	-30 to +100	˚C
Storage temperature		T_{stg}	-40 to +125	˚C
*2 Soldering temperature		T_{sol}	260	˚C

*1 40 to 60%RH, AC for 1minute, f=60Hz
*2 For 10s
*3 f=50Hz sine wave



■ Electro-optical Characteristics

(T_a=25˚C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	I_F=20mA	–	1.2	1.4	V
	Reverse current		I_R	V_R=3V	–	–	10	μA
Output	Repentitive peak OFF-state current		I_{DRM}	V_D=V_{DRM}	–	–	1	μA
	ON-state voltage		V_T	I_T=0.05A	–	–	2.5	V
	Holding current		I_H	V_D=6V	0.1	–	3.5	mA
	Critical rate of rise of OFF-state voltage		dV/dt	V_D=1/√2 ·V_{DRM}	100	1 000	–	V/μs
Transfer characteristics	Minimum trigger current	No rank	I_{FT}	V_D=6V, R_L=100Ω	–	–	10	mA
		Rank R			–	–	7	
		Rank L			–	–	5	
	Isolation resistance		R_{ISO}	DC500V,40 to 60%RH	5×10^{10}	10^{11}	–	Ω
	Turn-on time		t_{on}	V_D=6V, R_L=100Ω, I_F=20mA	–	–	100	μs

■ Model Line-up (1) (Lead-free components)

Shipping Package	Sleeve		Taping				I_{FT} rank	I_{FT}[mA] (V_D=6V, R_L=100Ω)
	100pcs/sleeve		3 000pcs/reel		750pcs/reel			
DIN EN60747-5-2	——	Approved	——	Approved	——	Approved		
Model No.	**S2S3000F**	**S2S3Y00F**	**S2S3A00F**	**S2S3AY0F**	**S2S3B00F**	**S2S3BY0F**	No rank	MAX.10
	S2S3R00F	**S2S3RY0F**	**S2S3RA0F**	**S2S3RAYF**	**S2S3RB0F**	**S2S3RBYF**	Rank R	MAX.7
	S2S3L00F	**S2S3LY0F**	**S2S3LA0F**	——	**S2S3LB0F**	——	Rank L	MAX.5

■ Model Line-up (2) (Lead solder plating components)

Shipping Package	Sleeve		Taping				I_{FT} rank	I_{FT}[mA] (V_D=6V, R_L=100Ω)
	100pcs/sleeve		3 000pcs/reel		750pcs/reel			
DIN EN60747-5-2	——	Approved	——	Approved	——	Approved		
Model No.	**S2S3**	**S2S3Y**	**S2S3A**	**S2S3AY**	**S2S3B**	**S2S3BY**	No rank	MAX.10
	S2S3R	**S2S3RY**	**S2S3RA**	**S2S3RAY**	**S2S3RB**	**S2S3RBY**	Rank R	MAX.7
	S2S3L	**S2S3LY**	**S2S3LA**	——	**S2S3LB**	——	Rank L	MAX.5

Please contact a local SHARP sales representative to inquire about production status.

Fig.1 Forward Current vs. Ambient Temperature

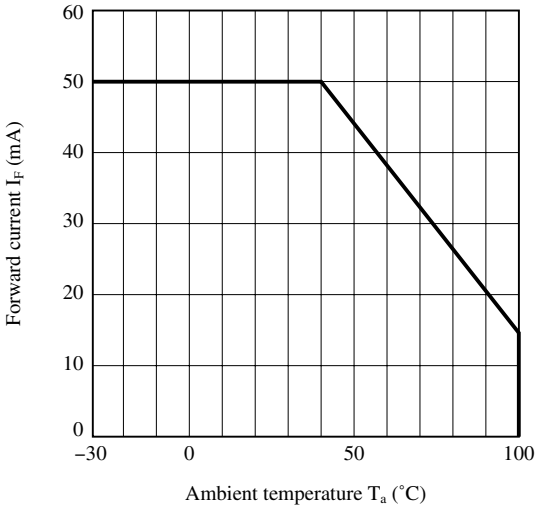


Fig.2 RMS ON-state Current vs. Ambient Temperature

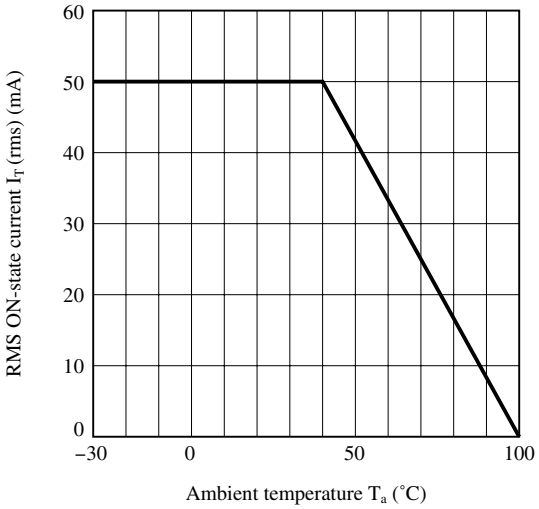


Fig.3-a Forward Current vs. Forward Voltage (No rank, Rank R)

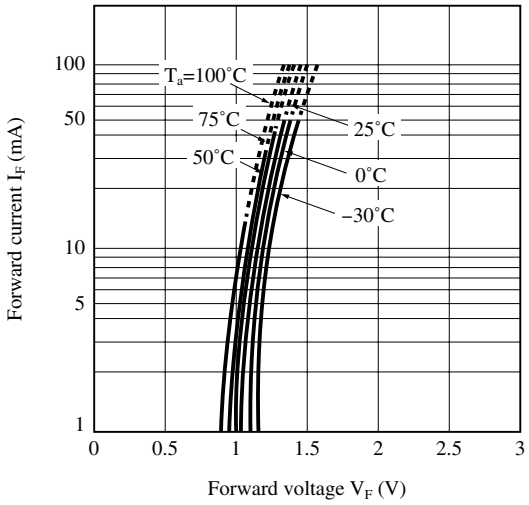


Fig.3-b Forward Current vs. Forward Voltage (Rank L)

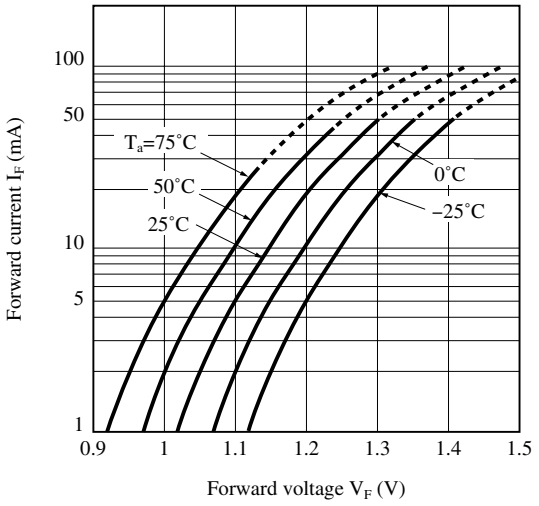


Fig.4 Minimum Trigger Current vs. Ambient Temperature

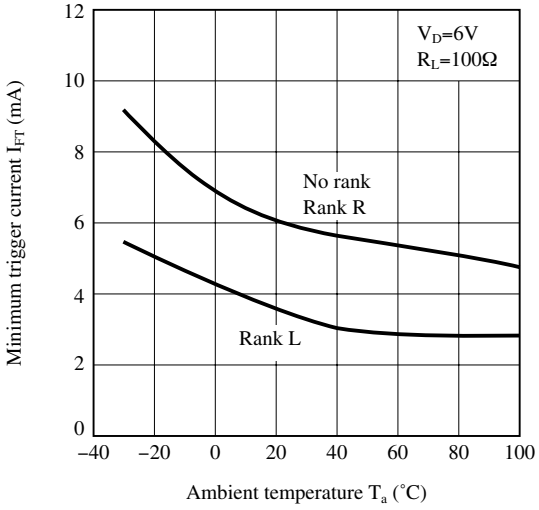


Fig.5 Relative Repetitive Peak OFF-state Voltage vs. Ambient Temperature

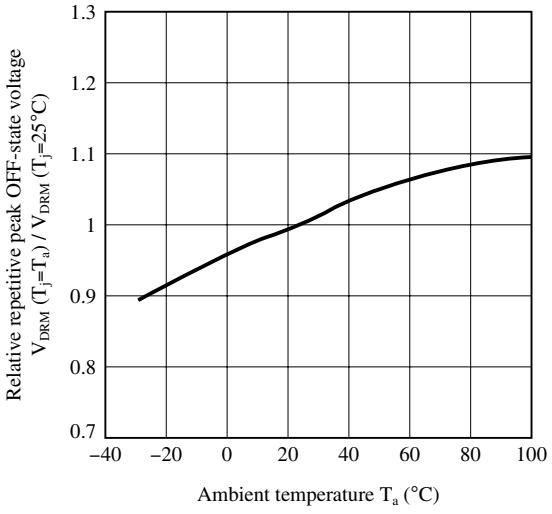


Fig.6 ON-state Voltage vs. Ambient Temperature

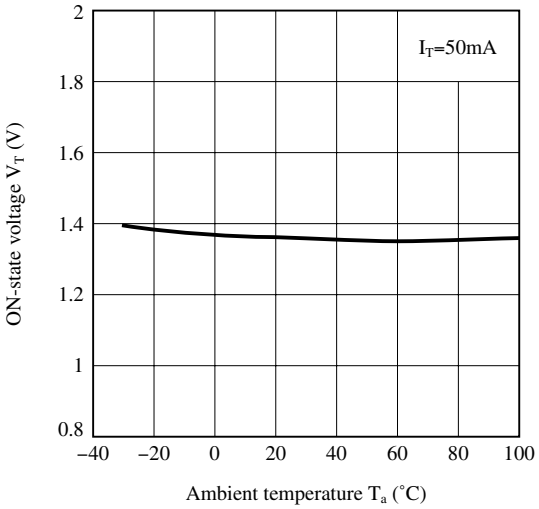


Fig.7 Holding Current vs. Ambient Temperature

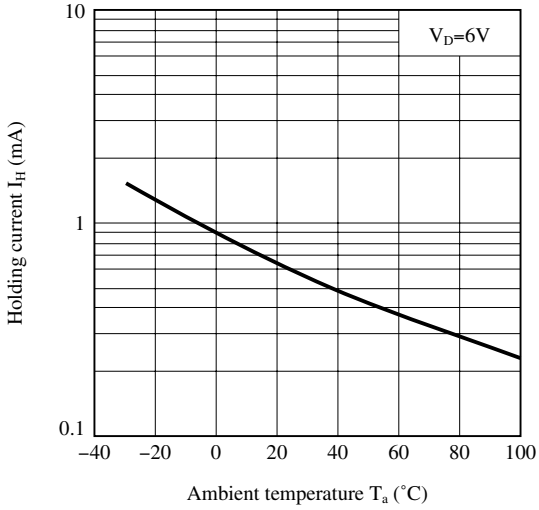


Fig.8 Repetitive Peak OFF-state Current vs. OFF-state Voltage

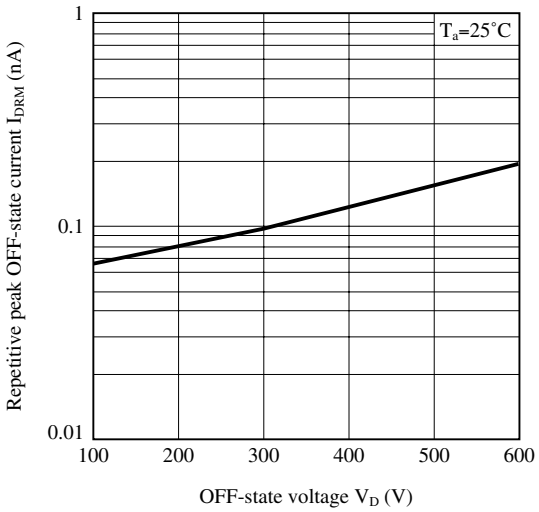


Fig.9 Relative Repetitive Peak OFF-state Current vs. Ambient Temperature

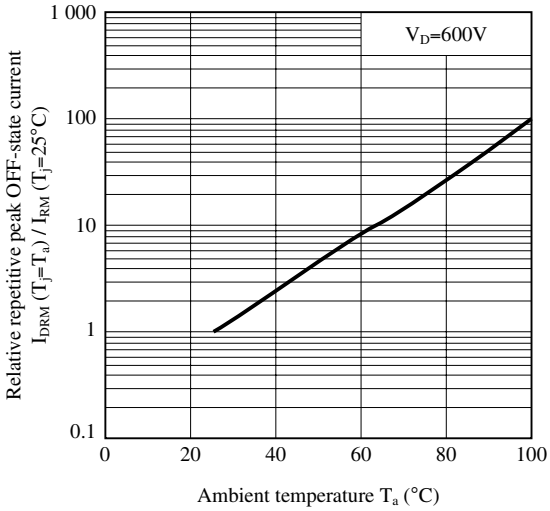


Fig.10-a Turn-on Time vs. Forward Current (No Rank, Rank R)

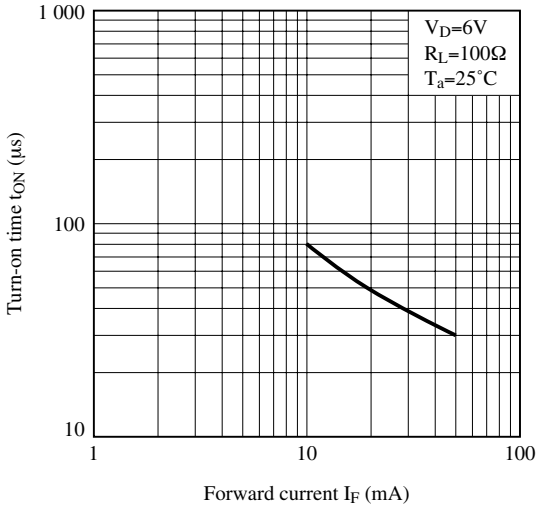


Fig.10-b Turn-on Time vs. Forward Current (Rank L)