PR29MF11NSZ Series/ PR39MF11NSZ Series

8-Pin DIP Type SSR for Low Power Control

■ Features

1. Compact 8-pin dual-in-line package type
2. RMS ON-state current $I_{T(rms)}$:0.9A
3. Built-in zero-cross circuit

   (PR29MF21NSZ/PR39MF21NSZ)

4. High repetitive peak OFF-state voltage

   PR29MF11NSZ/PR29MF21NSZ V_{DRM}:MIN. 400V
   PR39MF11NSZ/PR39MF21NSZ V_{DRM}:MIN. 600V

5. Isolation voltage between input and output

   ($V_{iso(rms)}$:4kV)

6. Recognized by UL, file No. E94758

   (PR29MF11NSZ/PR39MF11NSZ)

7. Approved by CSA No. LR63705

   (PR29MF11NSZ/PR39MF11NSZ)

8. **PR29MF21NSZ/PR39MF21NSZ**:under preparation
   for UL and CSA

■ Applications

1. Various types of home appliances

■ Model Line-up

	For 100V line	For 200V line
No built-in zero-cross circuit	**PR29MF11NSZ**	**PR39MF11NSZ**
Built-in zero-cross circuit	**PR29MF21NSZ**	**PR39MF21NSZ**

■ Absolute Maximum Ratings   (Ta=25°C)

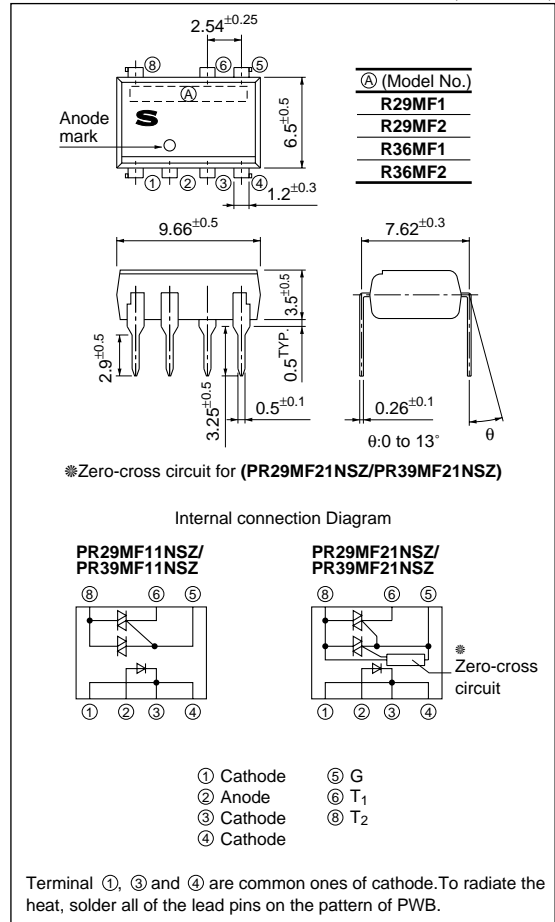| Parameter		Symbol	Rating	Unit
Input	[*1] Forward current	I_F	50	mA
	Reverse voltage	V_R	6	V
Output	[*1] RMS ON-state current	$I_{T (rms)}$	0.9	A
	Peak one cycle surge current	I_{surge}	9 (50Hz sine wave)	A
	Repetitive peak OFF-state voltage — PR29MF11NSZ	V_{DRM}	400	V
	PR29MF21NSZ			
	PR39MF11NSZ		600	
	PR39MF21NSZ			
	[*2] Isolation voltage	$V_{iso (rms)}$	4.0	kV
	Operating temperature — PR29MF11NSZ	T_{opr}	−25 to +85	°C
	PR39MF11NSZ			
	PR29MF21NSZ		−30 to +85	
	PR39MF21NSZ			
	Storage temperature	T_{stg}	−40 to +125	°C
	Soldering temperature	T_{sol}	260 (For 10s)	°C

*1 The derating factors of absolute maximum ratings due to ambient temperature are shown in Fig.1, 2
*2 AC for 1 min, 40 to 60%RH, f=60Hz

■ Outline Dimensions   (Unit : mm)

Ⓐ (Model No.)
R29MF1
R29MF2
R36MF1
R36MF2

※Zero-cross circuit for **(PR29MF21NSZ/PR39MF21NSZ)**

Internal connection Diagram

PR29MF11NSZ/ PR39MF11NSZ

PR29MF21NSZ/ PR39MF21NSZ

※ Zero-cross circuit

① Cathode   ⑤ G
② Anode   ⑥ T_1
③ Cathode   ⑧ T_2
④ Cathode

Terminal ①, ③ and ④ are common ones of cathode.To radiate the heat, solder all of the lead pins on the pattern of PWB.

■ Electrical Characteristics

(Ta=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	Repetitive peak OFF-state current	I_{DRM}	V_D=V_{DRM}	–	–	100	μA
	ON-state voltage	V_T	I_T=0.9A	–	–	3.0	V
	Holding current	I_H	V_D=6V	–	–	25	mA
	Critical rate of rise of OFF-state voltage	dV/dt	V_D=1/√2 • V_{DRM}	100	–	–	V/μs
	Zero-cross voltage **PR29MF21NSZ** **PR39MF21NSZ**	V_{OX}	I_F=15mA, R load	–	–	35	V
Transfer characteristics	Minimum trigger current	I_{FT}	V_D=6V, R_L=100Ω	–	–	10	mA
	Isolation resistance	R_{ISO}	DC=500V, 40 to 60%RH	$5×10^{10}$	10^{11}	–	Ω
	Turn-on time **PR29MF11NSZ/PR39MF11NSZ** **PR29MF21NSZ/PR39MF21NSZ**	t_{on}	V_D=6V, R_L=100Ω, I_F=20mA	–	–	100 / 50	μs

Fig.1 RMS ON-state Current vs. Ambient Temperature (PR29MF11NSZ/PR39MF11NSZ)
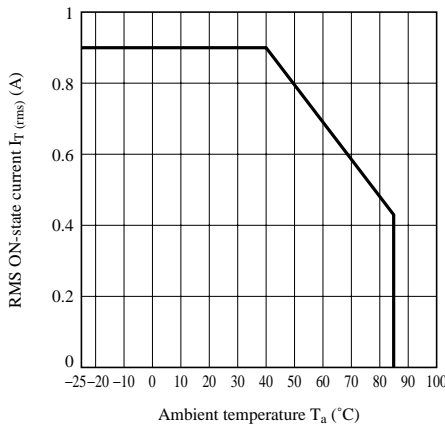
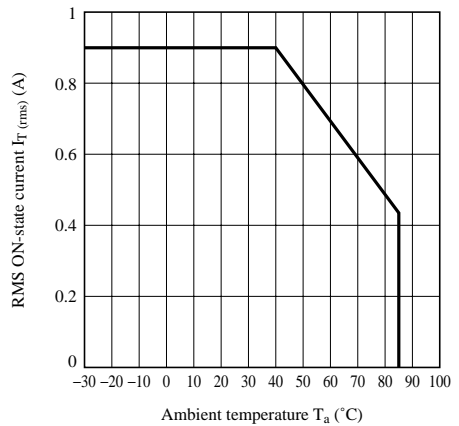**Fig.2 RMS ON-state Current vs. Ambient Temperature (PR29MF21NSZ/PR39MF21NSZ)**

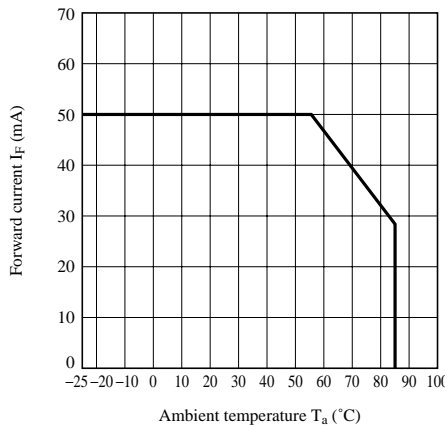**Fig.3 Forward Current vs. Ambient Temperature (PR29MF11NSZ/PR39MF11NSZ)**

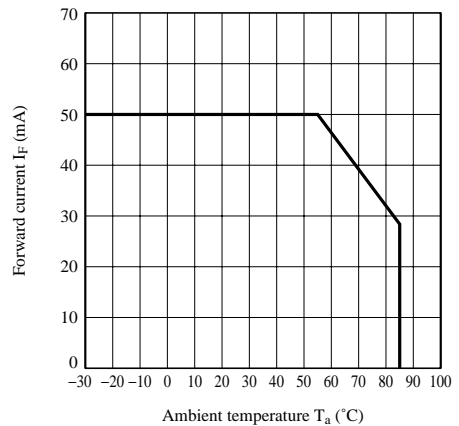**Fig.4 Forward Current vs. Ambient Temperature (PR29MF21NSZ/PR39MF21NSZ)**

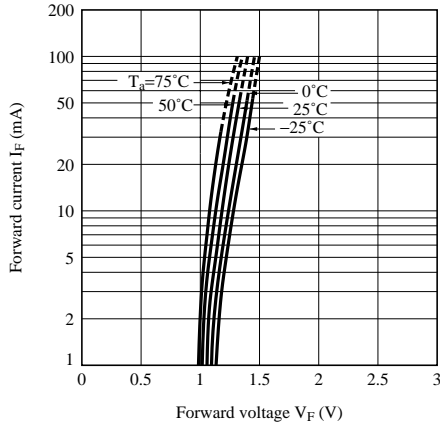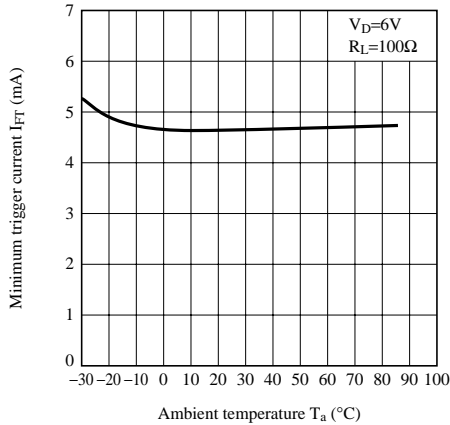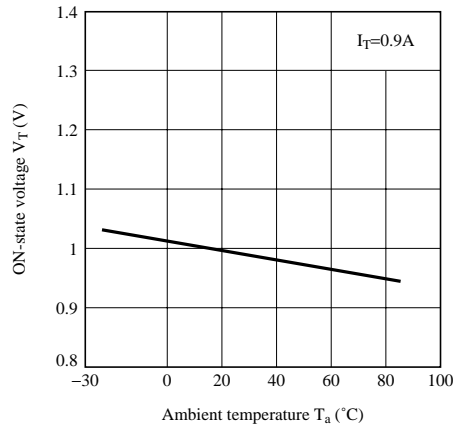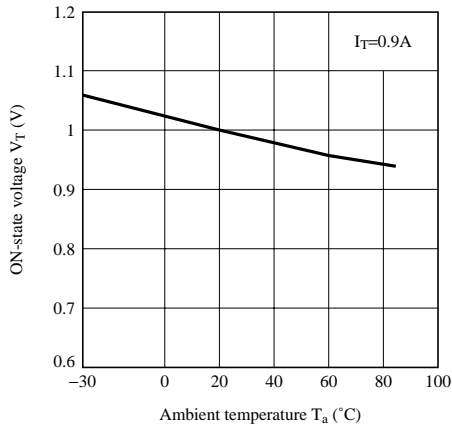**Fig.5 Forward Current vs. Forward Voltage**

Forward current I_F (mA)
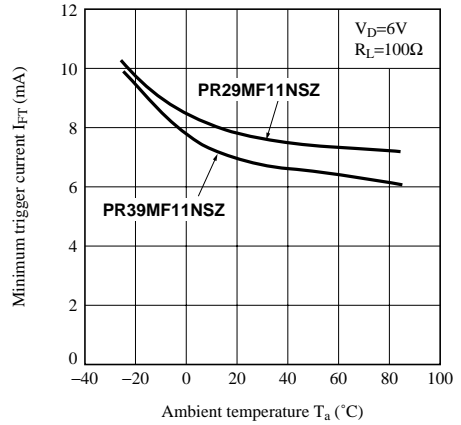
$T_a=75°C$
$50°C$
$0°C$
$25°C$
$-25°C$

Forward voltage V_F (V)

Fig.6 Minimum Trigger Current vs. Ambient Temperature

Minimum trigger current I_{FT} (mA)

$V_D=6V$
$R_L=100\Omega$

PR29MF11NSZ

PR39MF11NSZ

Ambient temperature T_a (°C)

Fig.7 Minimum Trigger Current vs. Ambient Temperature (PR29MF21NSZ/PR39MF21NSZ)

Minimum trigger current I_{FT} (mA)

$V_D=6V$
$R_L=100\Omega$

Ambient temperature T_a (°C)

Fig.8 ON-state Voltage vs. Ambient Temperature (PR29MF11NSZ/PR39MF11NSZ)

ON-state voltage V_T (V)

$I_T=0.9A$

Ambient temperature T_a (°C)

Fig.9 ON-state Voltage vs. Ambient Temperature (PR29MF21NSZ/PR39MF21NSZ)

ON-state voltage V_T (V)

$I_T=0.9A$

Ambient temperature T_a (°C)

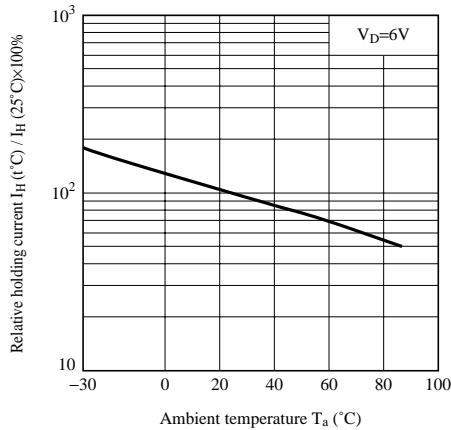**Fig.10 Relative Holding Current vs. Ambient Temprature (PR29MF11NSZ/PR39MF11NSZ)**

Relative holding current I_H (t°C) / I_H (25°C)×100%

$V_D=6V$

Ambient temperature T_a (°C)

Fig.11 Relative Holding Current vs. Ambient Temperature (PR29MF21NSZ/PR39MF21NSZ)

Relative holding current I_H (t°C) / I_H (25°C)×100%

V_D=6V
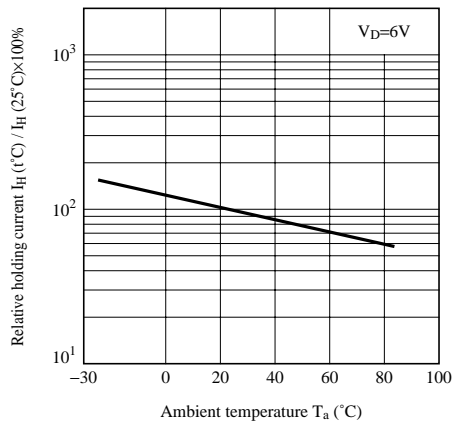
Ambient temperature T_a (°C)

Fig.12 Zero-cross Voltage vs. Ambient Temperature (PR29MF21NSZ/PR39MF21NSZ)

Zero-cross voltage V_{OX} (V)

R load, I_F=15mA

Ambient temperature T_a (°C)
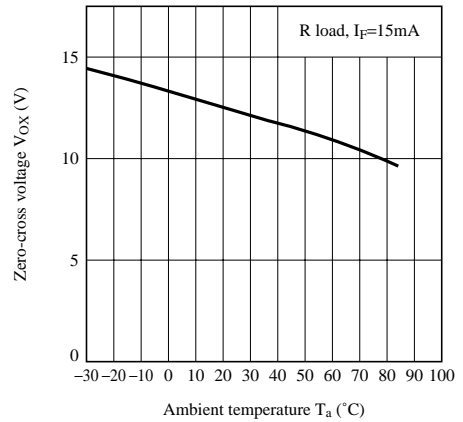
Fig.13 ON-state Current vs. ON-state Voltage (PR29MF11NSZ/PR39MF11NSZ)

ON-state current I_T (A)

I_F=20mA
T_a=25°C

ON-state voltage V_T (V)
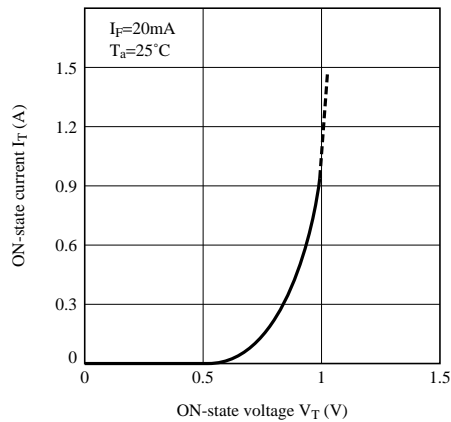
Fig.14 ON-state Current vs. ON-state Voltage (PR29MF21NSZ/PR39MF21NSZ)

ON-state current I_T (A)

I_F=20mA
T_a=25°C

ON-state voltage V_T (V)
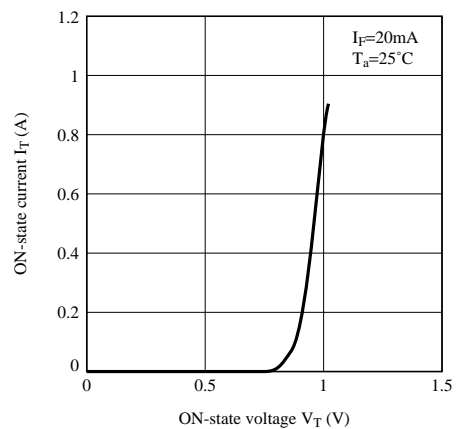
Fig.15 Turn-on Time vs. Forward Current (PR29MF11NSZ)

Turn-on time t_{ON} (μs)

V_D=6V
R_L=100Ω
T_a=25°C

Forward current I_F (mA)
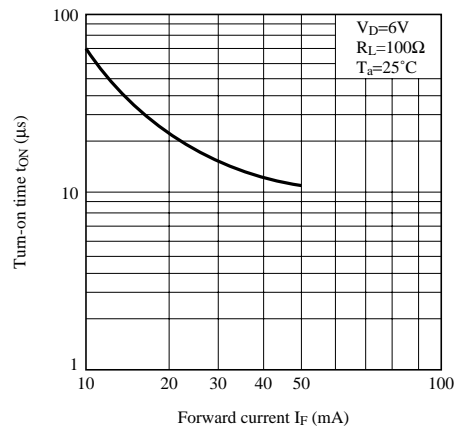
Fig.16 Turn-on Time vs. Forward Current (PR39MF11NSZ)

Turn-on time t_{ON} (μs)

V_D=6V
R_L=100Ω
T_a=25°C
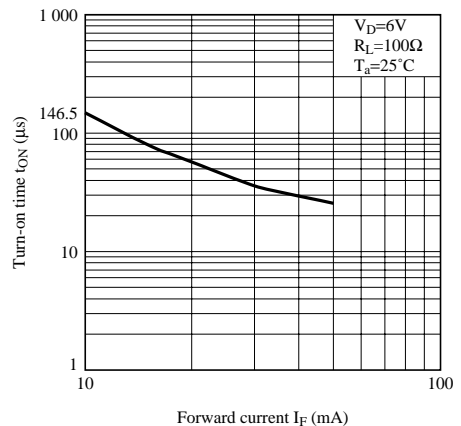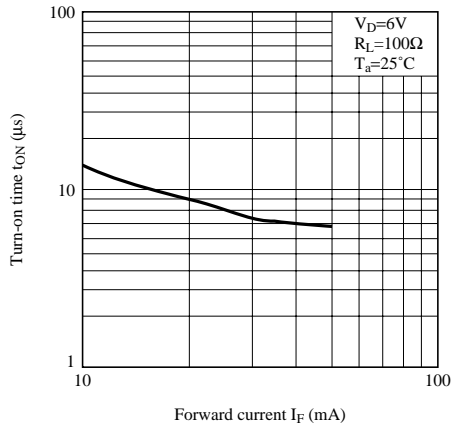
146.5

Forward current I_F (mA)

Fig.17 Turn-on Time vs. Forward Current (Typical Value)
(PR29MF21NSZ/PR39MF21NSZ)

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