S21MD10V

Built-in Zero-cross Circuit, High Noise Resistance Type Phototriac Coupler

■ Features

1. Built-in zero-cross circuit
2. High critical rate of rise of OFF-state voltage
   (dV/dt:MIN. 1 000V/μs)
3. High repetitive peak OFF-state voltage (V_{DRM}:MIN. 600V)
4. Isolation voltage between input and output
   ($V_{iso\,(rms)}$:5kV)
5. Recognized by UL, file No.E64380

❋ DIN-VDE 0884 approved type is also available as an option
   Approved by VDE, No.104842

❋ **S21MD10V** is for 200V line

■ Applications

1. For triggering medium/high power triac

■ Outline Dimensions

(Unit : mm)

■ Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	Reverse voltage	V_R	6	V
Output	RMS ON-state current	$I_{T\,(rms)}$	0.1	A
	*1 Peak one cycle surge current	I_{surge}	1.2	A
	Repetitive peak OFF-state voltage	V_{DRM}	600	V
*2 Isolation voltage		$V_{iso\,(rms)}$	5	kV
Operating temperature		T_{opr}	−30 to +100	°C
Storage temperature		T_{stg}	−55 to +125	°C
*3 Soldering temperature		T_{sol}	260	°C

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

■ Electro-optical 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^{-5}	A
Output	Repetitive peak OFF-state current	I_{DRM}	V_{DRM}=Rated	–	–	10^{-6}	A
	On-state voltage	V_T	I_T=100mA	–	–	3.0	V
	Holding current	I_H	V_D=6V	0.1	–	3.5	mA
	Critical rate of rise of OFF-state voltage	dV/dt	V_{DRM}=1/√2 Rated	1 000	2 000	–	V/µs
	Zero-cross voltage	V_{OX}	Resistance load, I_F=10mA	–	–	20	V
Transfer charac-ter istics	Minimum trigger current	I_{FT}	V_D=6V, R_L=100Ω	–	–	5	mA
	Isolation resistance	R_{ISO}	DC500V, 40 to 60%RH	$5×10^{10}$	$1×10^{11}$	–	Ω
	Turn-on time	t_{on}	V_D=6V, R_L=100Ω, I_F=20mA	–	–	35	µs

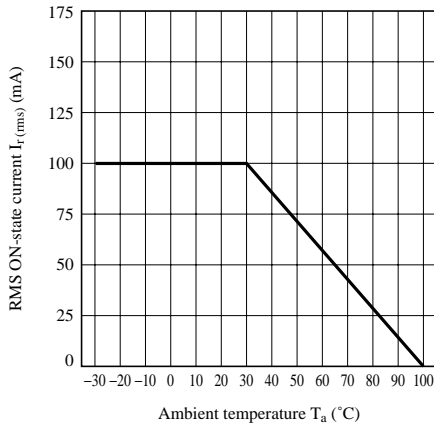### Fig.1 RMS ON-state Current vs. Ambient Temperature

Fig.2 Forward Current vs. Ambient Temperature
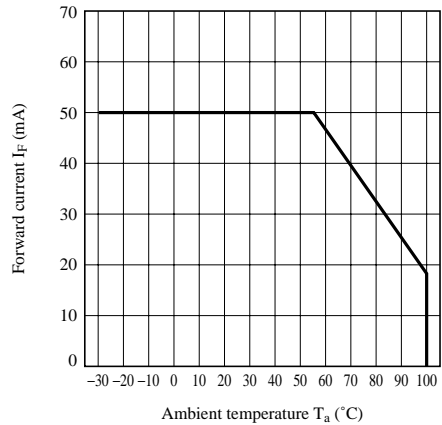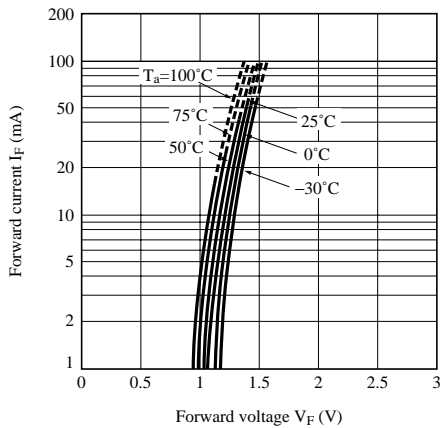

Fig.3 Forward Current vs. Forward Voltage

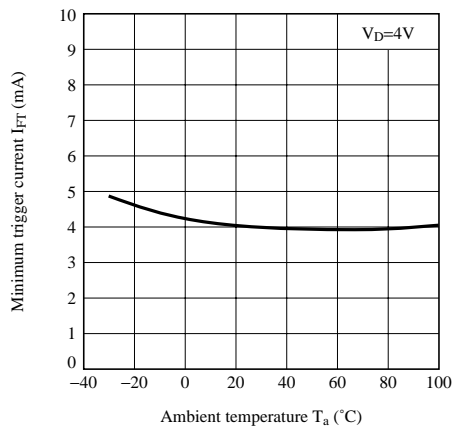### Fig.4 Minimum Trigger Current vs. Ambient Temperature
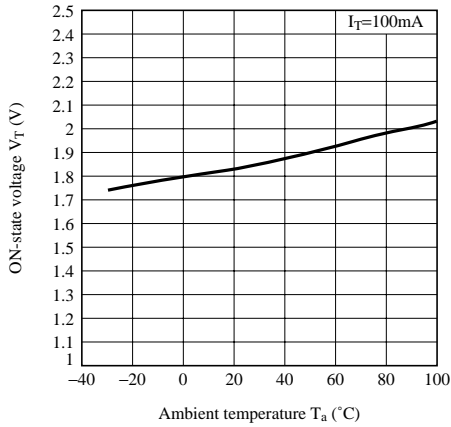
Fig.5 ON-state Voltage vs. Ambient Temperature

ON-state voltage V_T (V) vs. Ambient temperature T_a (°C)

I_T=100mA

Fig.6 Holding Current vs. Ambient Temperature

Holding current I_H (mA) vs. Ambient temperature T_a (°C)

V_D=4V
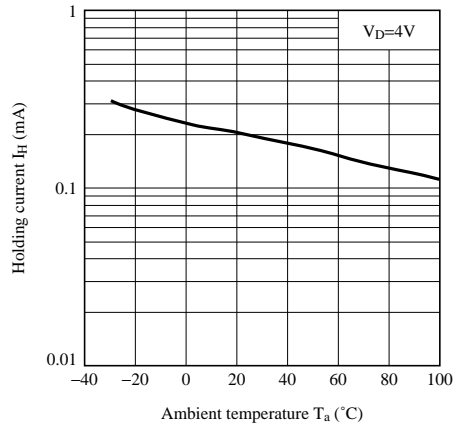
Fig.7 Repetitive Peak OFF-state Current vs. Ambient Temperature

Repetitive peak OFF-state current I_{DRM} (μA) vs. Ambient temperature T_a (°C)

V_D=600V
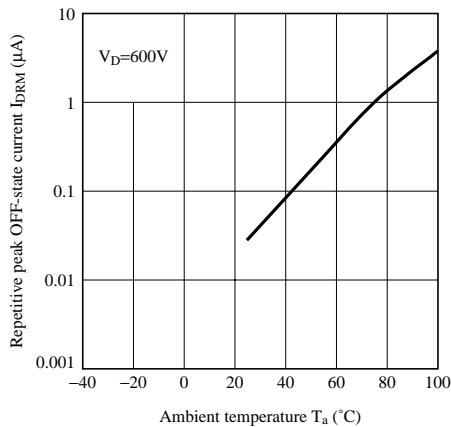
Fig.8 Relative Repetitive Peak OFF-state Voltage vs. Ambient Temperature

Relative repetitive peak OFF-state voltage V_{DRM} (T_j=T_a) / V_{DRM} (T_j=25°C) vs. Ambient temperature T_a (°C)
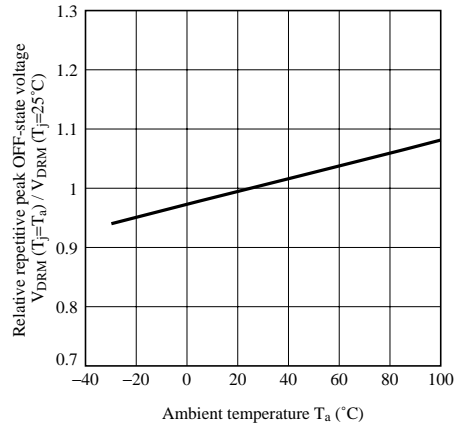
Fig.9 Turn-on Time vs. Forward Current

Turn-on time t_{ON} (μs) vs. Forward current I_F (mA)

V_D=6V
R_L=100Ω
T_a=25°C
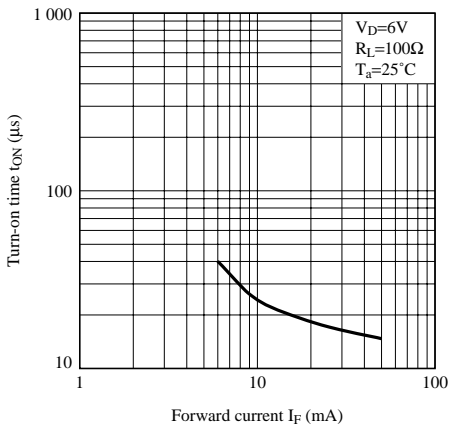
Fig.10 Zero-cross Voltage vs. Ambient Temperature

Zero-cross voltage V_{OX} (V) vs. Ambient temperature T_a (°C)
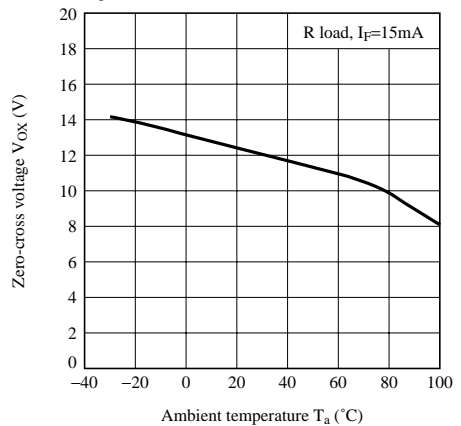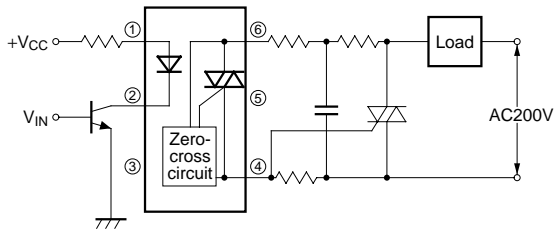
R load, I_F=15mA

Fig.11 Basic Operation Circuit

Medium/High Power Triac Drive Circuit

Note) Please use on condition of the triac for power triggers.

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