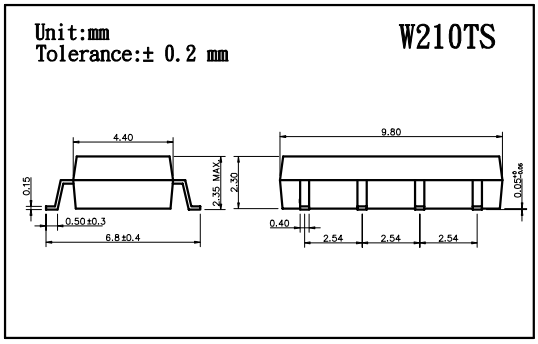
W210TS

HIGH VOLTAGE, PHOTO MOS RELAY

COSMO

FEATURES

- Photo Mos Relay and Optocoupler in One Package
- Control 350VAC or DC Voltage
- Switch 130mA Loads
- LED control Current, 5mA
- Low ON-Resistance
- dv/dt, >500V/ms
- Isolation Test Voltage, 1500VACrms



Absolute Maximum Ratings(Ta=25℃)

Emitter(Input)

Reverse Voltage 5.0V
Continuous Forward Current 50mA
Peak Forward Current 1A
Power Dissipation 100mW
Derate Linearly from 25℃ ..... 1.3mW/℃

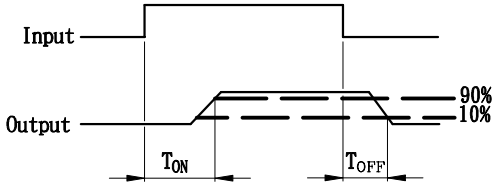
Detector(Output)

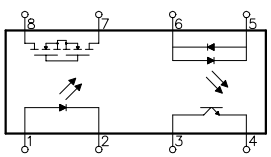
Output Breakdown Voltage ..... ± 350V
Continuous Load Current ..... ± 130mA
Power Dissipation 500mW

General Characteristics

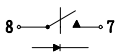
Isolation Test Voltage 1500VACrms
Isolation Resistance Vio=500V, Ta=25℃ ..... $\geqq 10^{10}\Omega$
Total Power Dissipation 550mW
Derate Linearly from 25℃ ..... 2.5mW/℃
Storage Temperature Range ..... -40℃ to +125℃
Operating Temperature Range ..... -30℃ to +85℃
Junction Temperature ..... 100℃
Soldering Temperature, 2mm from case, 10 sec ..... 260℃

● Turn on/Turn off time





1 FORM A
NORMALLY OPEN



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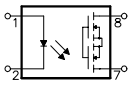
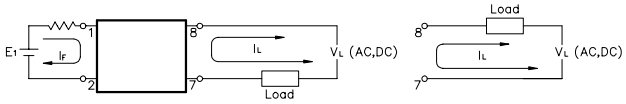
Characterisitcs (Ta=25℃)

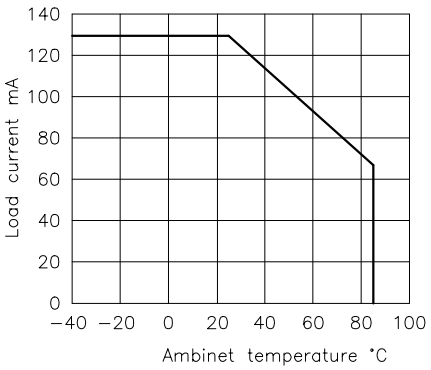
Description	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Emitter(Input)						
Forward Voltage	VF		1.2	1.5	V	IF=10mA
Operation Input Current	IFON			5	mA	VL=± 20V, IL=100mA t=10mS
Recovery Input Current	IFOFF	0.2			mA	VL=± 20V, IL<=5uA
Detector (output)						
Output Breakdown Voltage	VB	350			V	IB=50uA
Output Off-State Leakage	IT(OFF)		0.2	1	uA	VT=100V, IF=0mA
I/O Capacitance	CISO		6		pF	IF=0, f=1MHz
ON Resistance	RON		20	30	Ω	IL=100mA, IF=10mA
Turn-on Time	TON		0.3	1.0	ms	IF=10mA, VL=± 20V
Turn-off Time	TOFF		0.7	1.5	ms	t=10ms, IL=± 100mA

Mos Relay Schematic and Wiring Diagrams

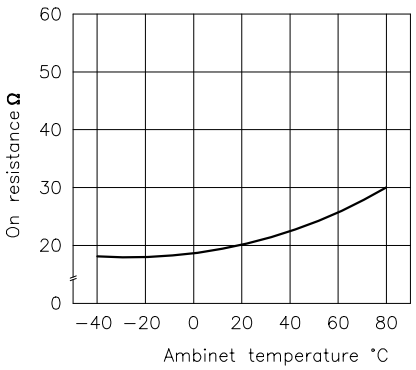
Type	Schematic	Output configur-ation	Load	Con-nection	Wiring Diagrams
W210TS		1a	AC/DC	-	

DATA CURVE

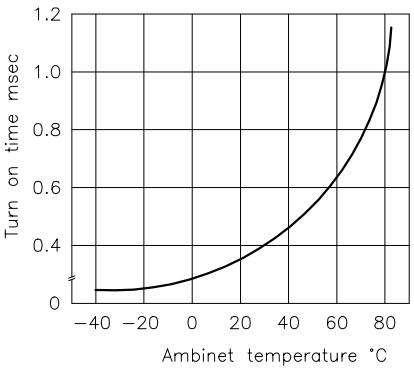
Load current vs. ambient temperature
Allowable ambient temperature:
-40℃ to +85℃



On resistance vs. ambient temperature
Across terminals 7 and 8 pin
LED current: 5mA
Continuouse load current: 130mA(DC)



Trun on time vs. ambient temperature
Load voltage 400V(DC)
LED current: 5mA
Continuouse load current: 130mA(DC)



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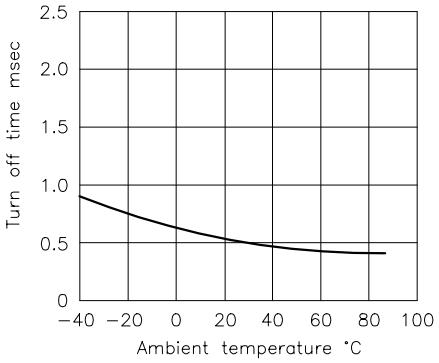
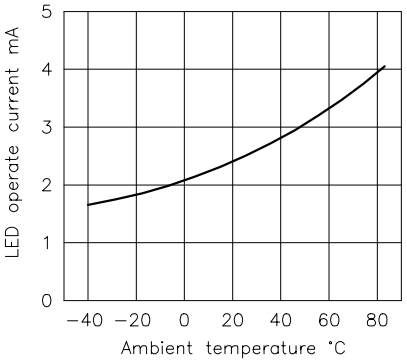
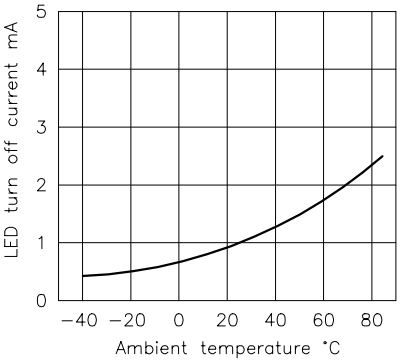
Turn off time vs. ambient temperature LED current: 5mA
Load voltage: 400V(DC)
Continuous load current: 130mA(DC)



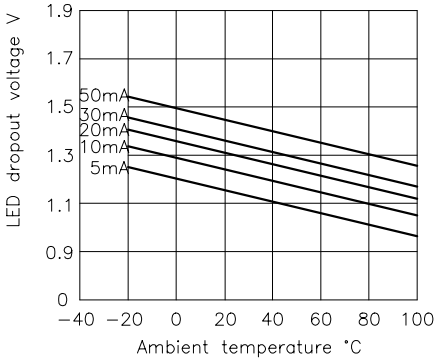
LED operate vs. ambient temperature Load voltage: 400V(DC)
Continuous load current: 130mA(DC)



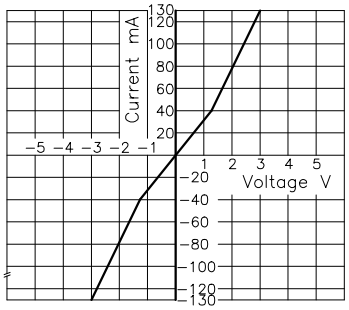
LED turn off current vs. ambient temperature
Load voltage: 400V(DC)
Continuons load current: 130mA(DC)



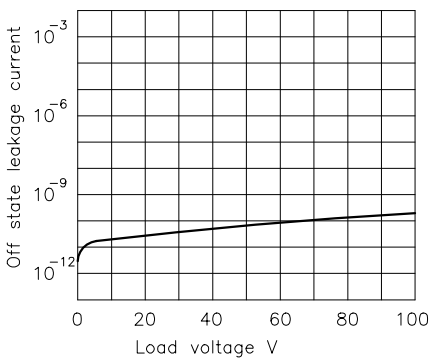
LED dropout voltage vs. ambient temperature
LED current: 5 to 50mA



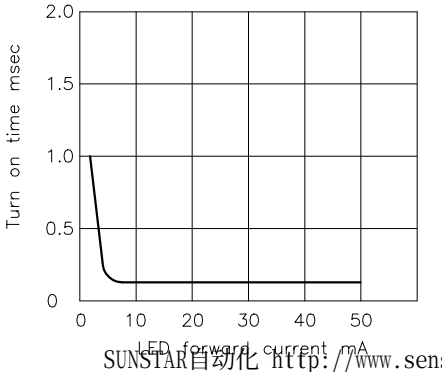
Voltage vs. current characteristics of output at MOS FET portion Measured portion: across terminal 7 and 8 pin
Ambient temperature: 25° C



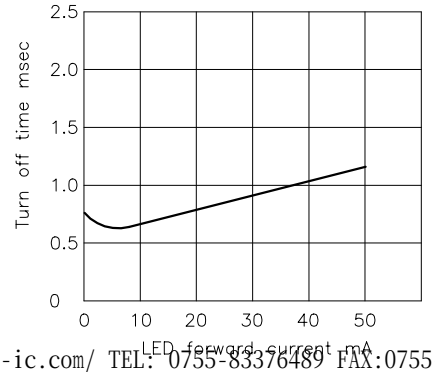
Off state leakage current Across terminals 7 and 8 pin
Ambient temperature: 25° C



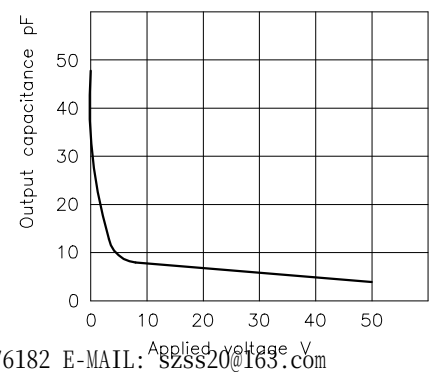
LED forward current vs. turn on time Across terminals 7 and 8 pin
load voltage: 400V(DC);Continuous load current:130mA(DC);Ambient temperature: 25° C



LED forward current vs. turn off time Across terminals 7 and 8 pin
load voltage: 400V(DC);Continuous load current:130mA(DC);Ambient temperature: 25° C



Applied voltage vs. output capacitance Across terminals 7 and 8 pin Frequency: 1MHz;Ambient temperature 25° C



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● Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	± 50	mA
	Peak forward current	I_{FM}	± 1	A
	Power dissipation	P_D	70	mW
Output	Collector-emitter voltage	V_{CEO}	60	V
	Emitter-collector voltage	V_{ECO}	6	V
	Collector current	Ic	50	mA
	Collector power dissipation	Pc	150	mW
Total power dissipation		P_{tot}	200	mW
Isolation voltage 1 minute		Viso	1500	Vrms
Operating temperature		Topr	-30 to +100	° C
Storage temperature		Tstg	-55 to +125	° C
Soldering temperature 10 second		Tsol	260	° C

● 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
	Peak forward voltage	V_{FM}	I_{FM}=± 0.5A	-	-	3.5	V
	Terminal capacitance	C_t	V=0, f=1kHz	-	30	-	pF
Output	Collector dark current	I_{CEO}	V_{CE}=20V, I_F=0	-	-	0.1	uA
Transfer characteristics	Current transfer ratio	CTR	I_F=± 1mA, V_{CE}=5V	30	100	-	%
	Collector-emitter saturation voltage	$V_{CE(sat)}$	I_F=± 20mA, Ic=1mA	-	0.1	0.3	V
	Isolation resistance	Riso	DC500V	$5x10^{10}$	10^{11}	-	ohm
	Floating capacitance	C_f	V=0, f=1MHz	-	0.6	1.0	pF
	Cut-off frequency	fc	V_{CC}=5V, Ic=2mA, R_L=100ohm	-	80	-	kHz
	Response time (Rise)	tr	V_{CC}=2V, Ic=2mA, R_L=100ohm	-	5	20	us
	Response time (Fall)	tf		-	4	20	us

Fig.1 Current Transfer Ratio vs. Forward Current

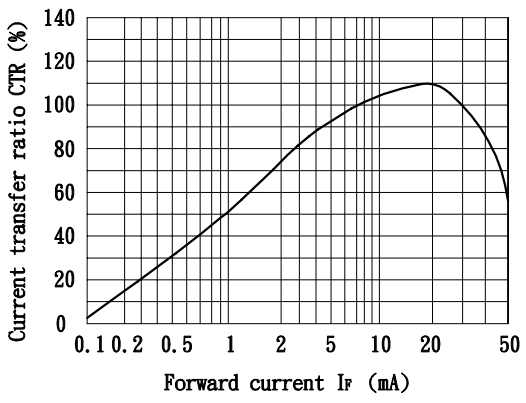

Fig.2 Collector Power Dissipation vs. Ambient Temperature

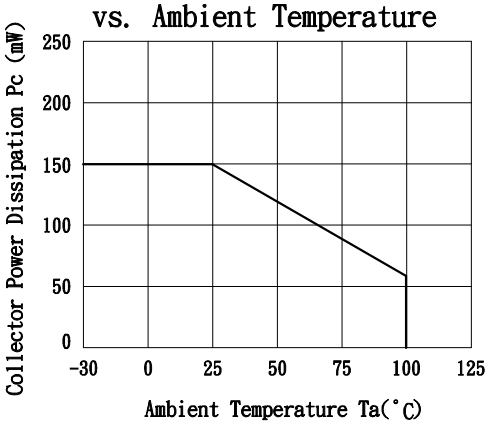

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Fig.3 Collector Dark Current vs. Ambient Temperature

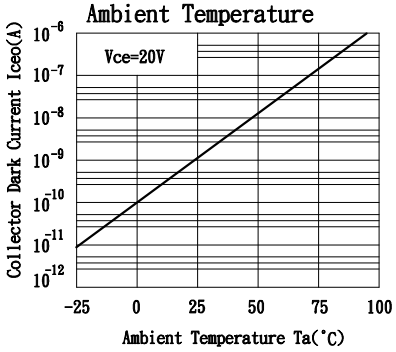

Fig.4 Forward Current vs. Ambient Temperature

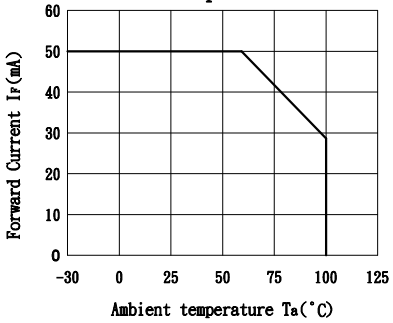

Fig.5 Forward Current vs. Forward Voltage

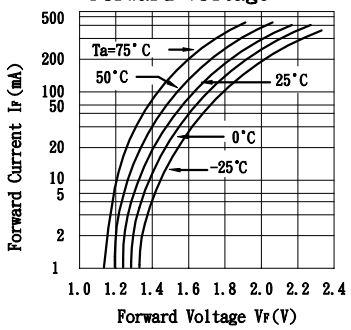

Fig.6 Collector Current vs. Collector-emitter Voltage

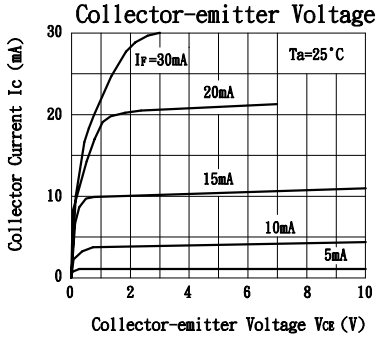

Fig.7 Relative Current Transfer Ratio Ambient Temperature

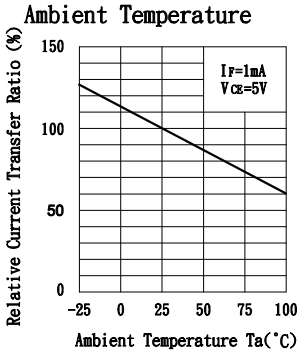

Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

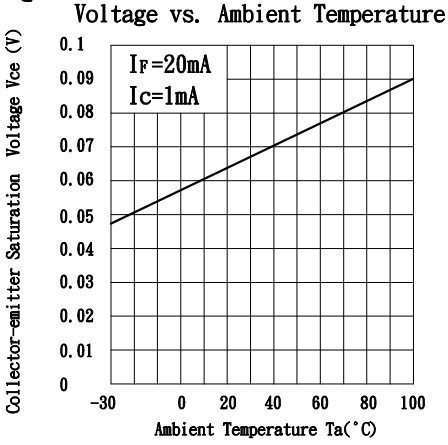

Fig.9 Collector-emitter Saturation Voltage vs. Forward Current

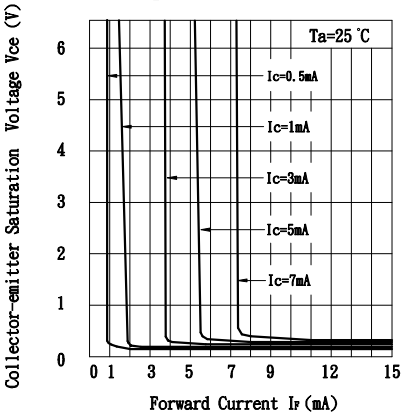

Fig.10 Response Time vs. Load Resistance

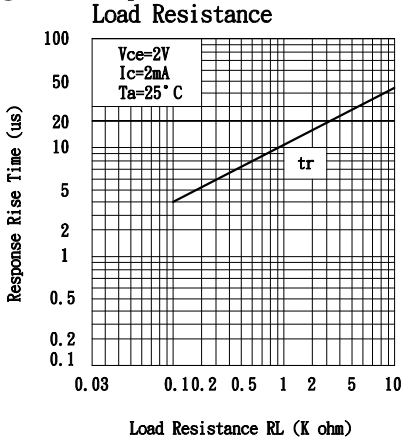

Fig.11 Response Time vs. Load Resistance