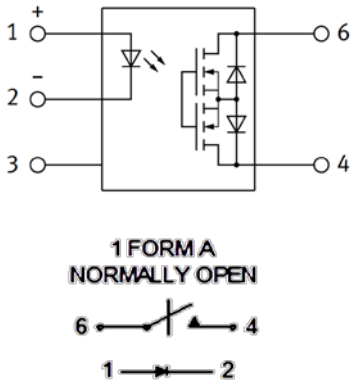
KAQV258 Series

5PIN 1500V N.O TYPE
SOLID STATE RELAY-MOSFET OUTPUT

Description

The KAQV258 series is robust, ideal for telecom and ground fault applications. It is a SPST normally open switch (1 Form A) that replaces electromechanical relays in many applications. It is constructed using a GaAlAs LED for actuation control and an integrated monolithic die for the switch output. The die, fabricated in a high-voltage dielectrically isolated technology, is comprised of a photodiode array, switch control circuitry and MOSFET switches.

Schematic



Features

1. Load voltage: 1,500 V
2. Load current: 50 mA
3. Safety Approvals:
   CQC GB4943.1-2022

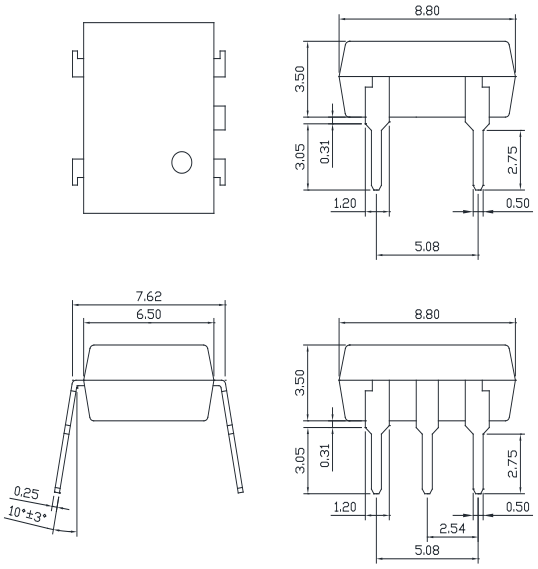
Application

- Isolation detection
- Voltage monitoring
- Signal control

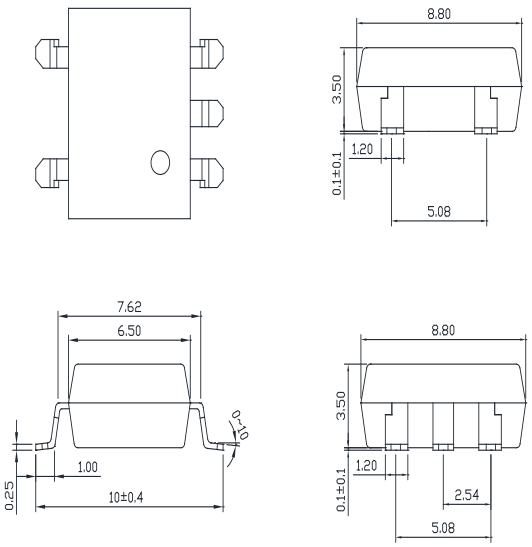
● Outside Dimension

Unit：mm

Dual in line type



Surface mount type



TOLERANCE： ±0.2mm

● Device Marking

Notes：

cosmo
V258 : Part NO.
YWW Y：Year code / W：Week code

● Absolute Maximum Ratings

(Ta=25℃)

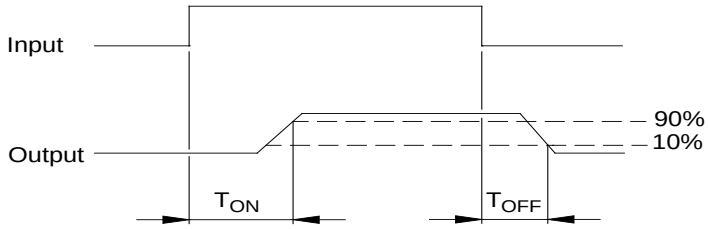
Parameter		Symbol	Ring	Unit
Input	Continuous forward current	I_F	50	mA
	Peak forward current	I_{FP}	1	A
	Reverse voltage	V_R	5	V
	Power dissipation	P_{in}	75	mW
Output	Load voltage	V_L	1500	V
	Continuous load current	I_L	0.05	A
	Peak load current	I_{peak}	0.18	A
	Power dissipation	P_{out}	500	mW
Isolation voltage		V_{iso}	5000	Vrms
Total power dissipation		P_t	500	mW
Derate linearly from 25℃		-	2.5	mW/℃
Operating temperature□		T_{opr}	-40 to +100	℃
Storage temperature		T_{stg}	-40 to +125	℃
Junction temperature		T_j	125	℃
Soldering temperature 10 seconds		T_{sot}	260	℃

● Electro-optical Characteristics

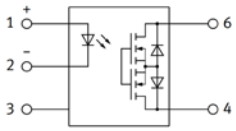
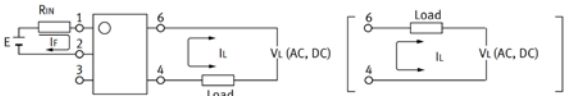
(Ta=25℃)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	V_F	I_F = 10 mA	-	1.2	1.5	V
	Operation input current	I_{FON}	I_L = Max.	-	0.8	3.0	mA
	Recovery input current	I_{FOFF}	I_L = Max.	0.2	-	-	mA
Output	On resistance	R_{on}	I_F = 10 mA I_L = Max. Within 1 s	-	150	300	Ω
	Off-state leakage curren□	I_{LEAK}	I_F = 0 mA V_L = Max.	-	-	1	μA
I/O capacitance		C_{iso}	f = 1 MHz V_B = 0 V	-	1.3	3	pF
Initial I/O isolation resistance		R_{iso}	500 V DC	1,000	-	-	MΩ
Turn-on time		T_{ON}	I_F=10mA I_L= Max.	-	0.15	1.0	ms
Turn-off time		T_{OFF}		-	0.07	0.2	ms

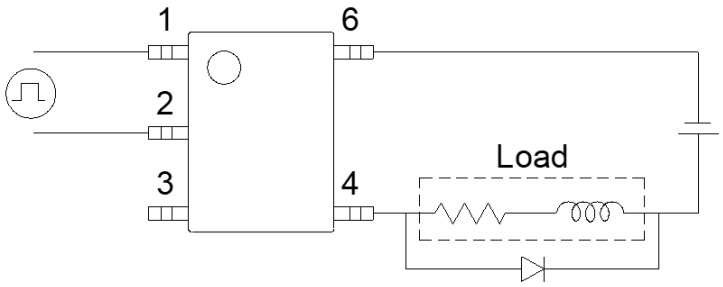
Turn-on / Turn-off Time

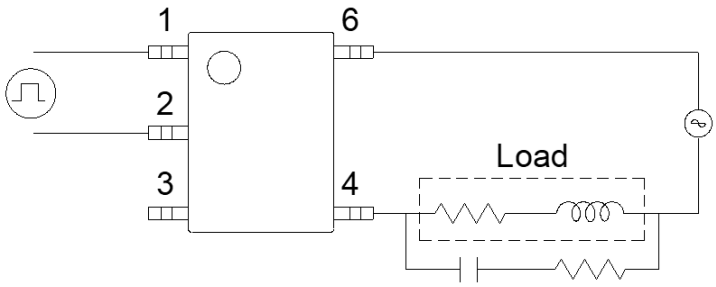


Schematic and Wiring Diagrams

Schematic	Output Configuration	Load	Connection	Wiring Diagrams
	1a	AC DC	-	

Using Methods





R-C Snubber

Fig 1. Load current vs Ambient Temperature

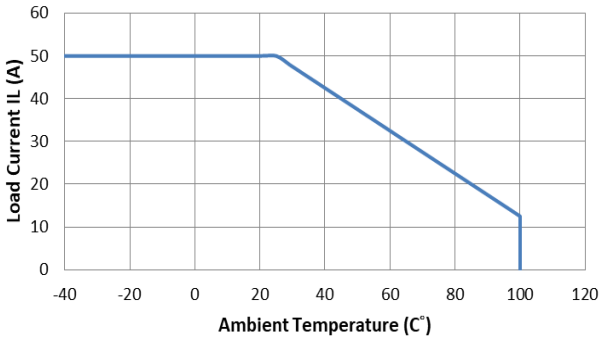


Fig. 2 On Resistance V.S. Ambient temperature

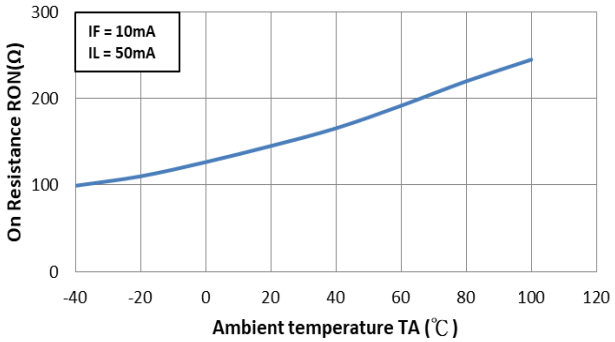


Fig. 3 Turn On Time V.S. Ambient temperature

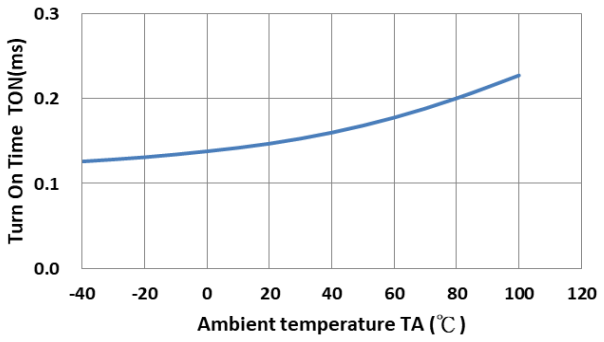


Fig. 4 Turn Off Time V.S. Ambient temperature

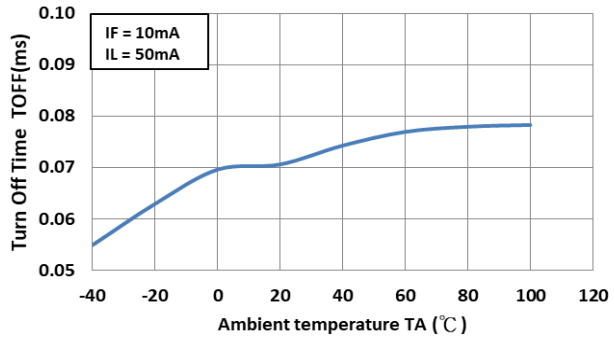


Fig. 5 Operate Input Current V.S. Ambient temperature

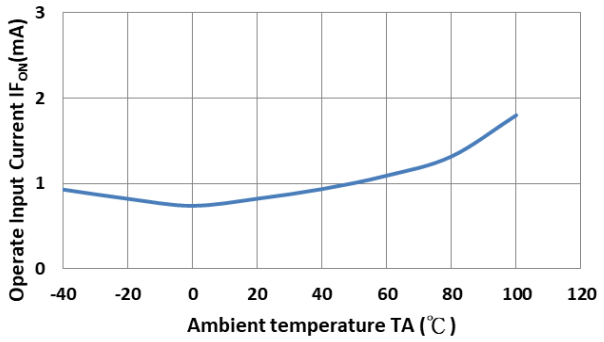


Fig. 6 Revover Input Current V.S. Ambient temperature

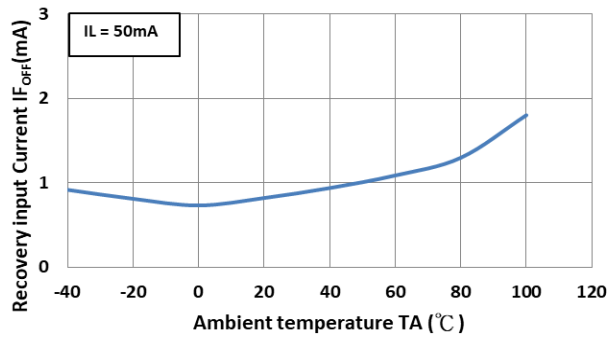


Fig 7. Forward voltage vs Ambient temperature

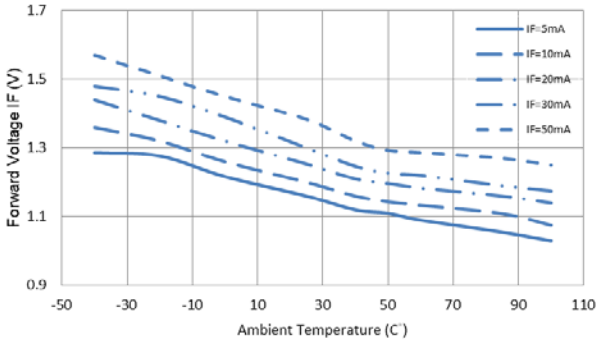


Fig. 8 Load Current V.S. Load Voltage

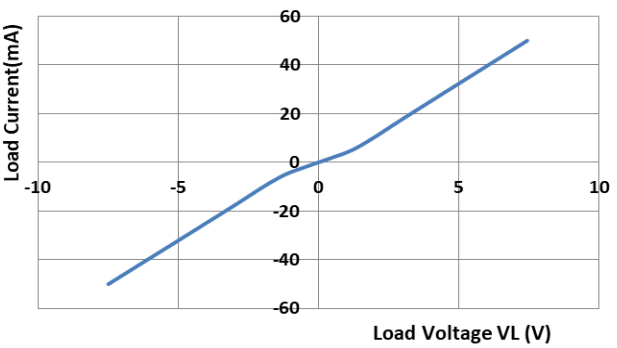


Fig. 9 Off State LeakageCurrent V.S. Load Voltage

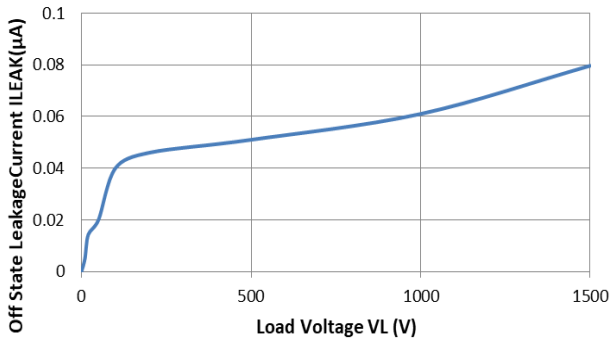


Fig. 10 Turn On Time V.S. Forward Current

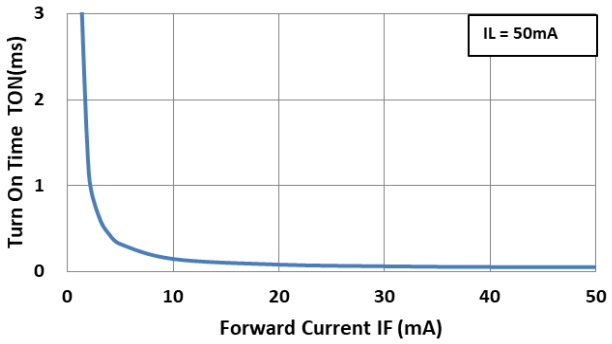
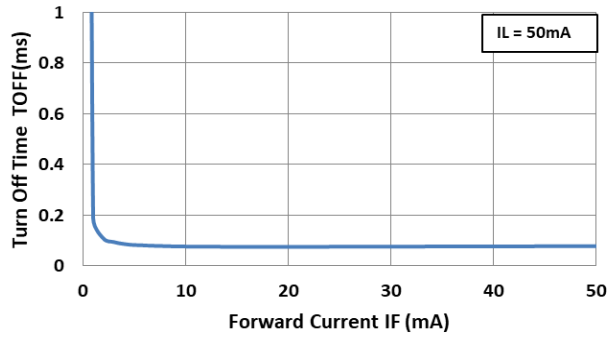


Fig. 11 Turn Off Time V.S. Forward Current

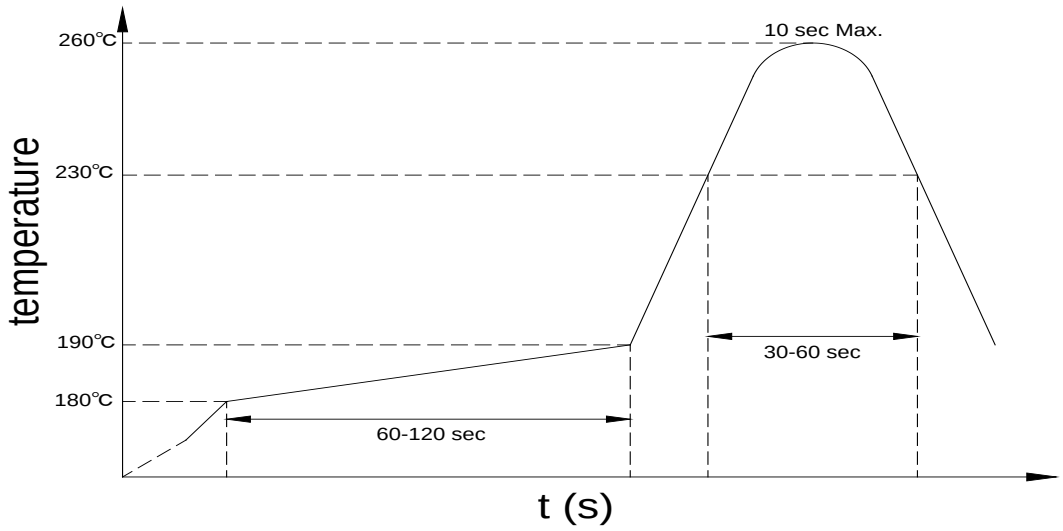


Recommended Soldering Conditions

(a) Infrared reflow soldering：

- Peak reflow soldering： 260℃ or below (package surface temperature)
- Time of peak reflow temperature: 10 sec
- Time of temperature higher than 230℃： 30-60 sec
- Time to preheat temperature from 180~190℃： 60-120 sec
- Number of reflows： Two
- Flux： Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

Recommended Temperature Profile of Infrared Reflow



(b) Wave soldering：

- Temperature： 260℃ or below (molten solder temperature)
- Time： 10 seconds or less
- Preheating conditions: 120℃ or below (package surface temperature)
- Number of times： One
- Flux： Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

(c) Cautions：

- Fluxes： Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.
- Avoid shorting between portion of frame and leads.

- **Numbering System**

KAQV258 X (Y)

Notes:

KAQV258 = Part No.

X = Lead form option (blank or A)

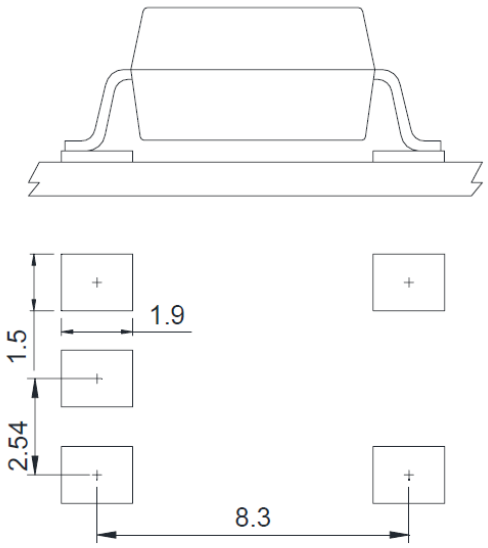
Y = Tape and reel option (TL、TR)

Option	Description	Packing quantity
A (TL)	surface mount type packag□+ TL tape & reel option	1000 uni□s per re□l
A (TR)	surfa□e mount type package □TR tape□& reel□option	1000 units pe□reel

- **Recommended Pad Layout for Surface Mount Lead Form**

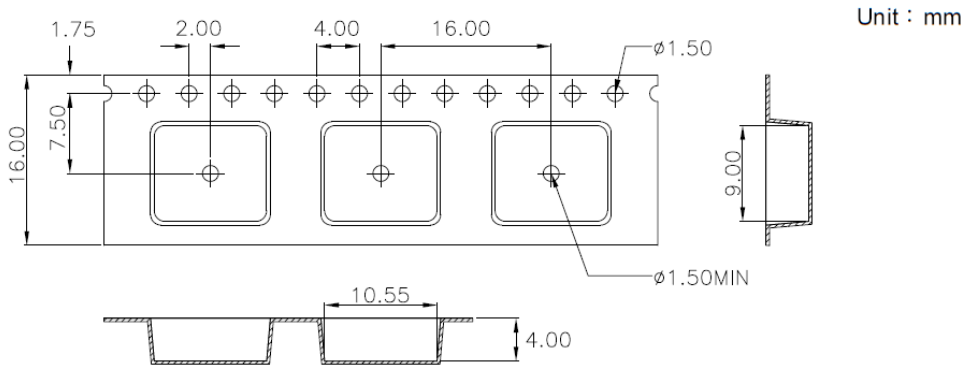
1. Surface mount type.

5-pin SMD

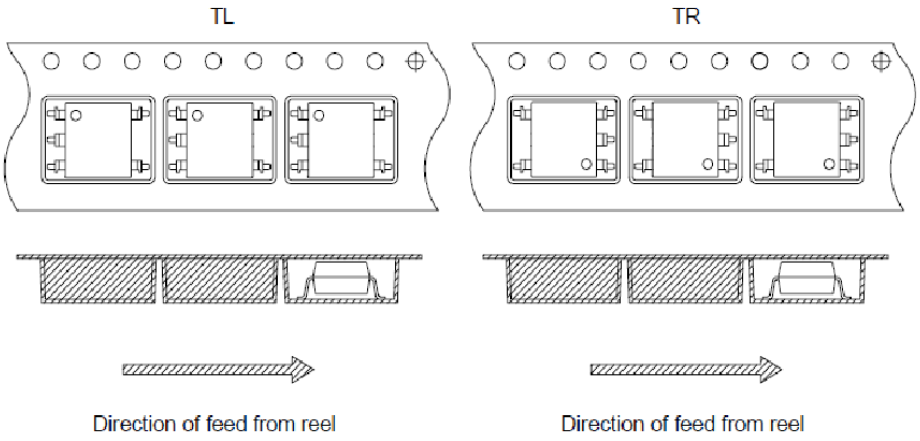


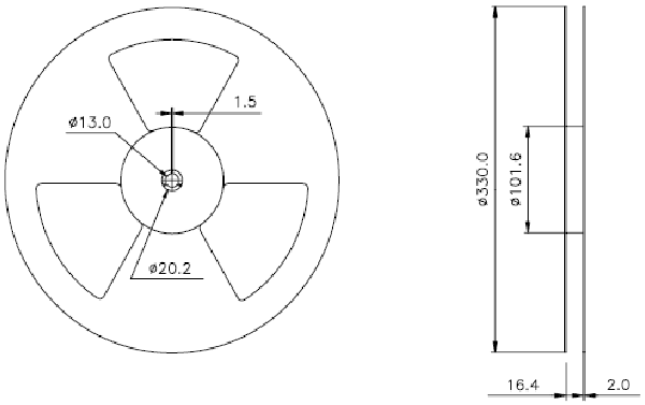
Unit：mm

- **6-pin SMD Carrier Tape & Reel**



TOLERANCE：±0.2mm





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