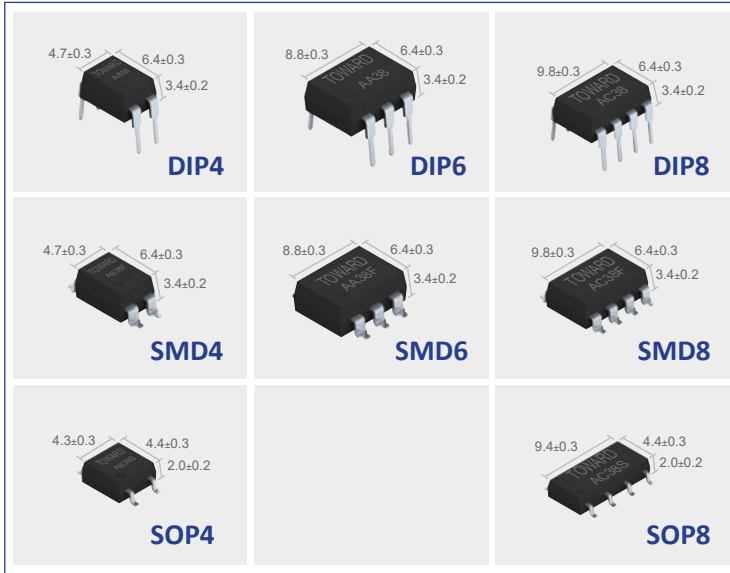


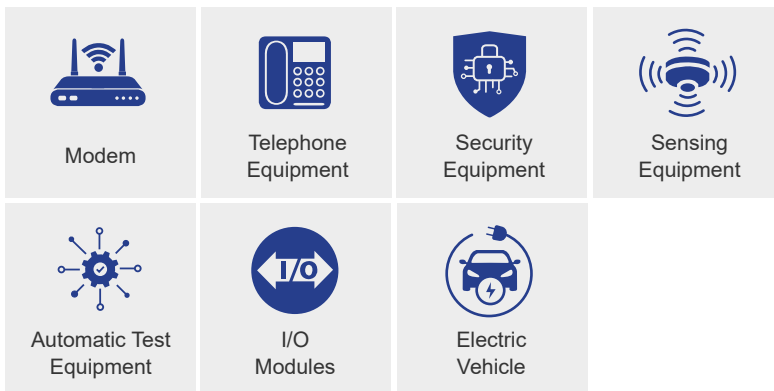


38 SERIES

600V .1a/2a



APPLICATIONS



KEY FEATURES

- High voltage with low on-resistance
- Fast reverse recovery time
- High avalanche ruggedness

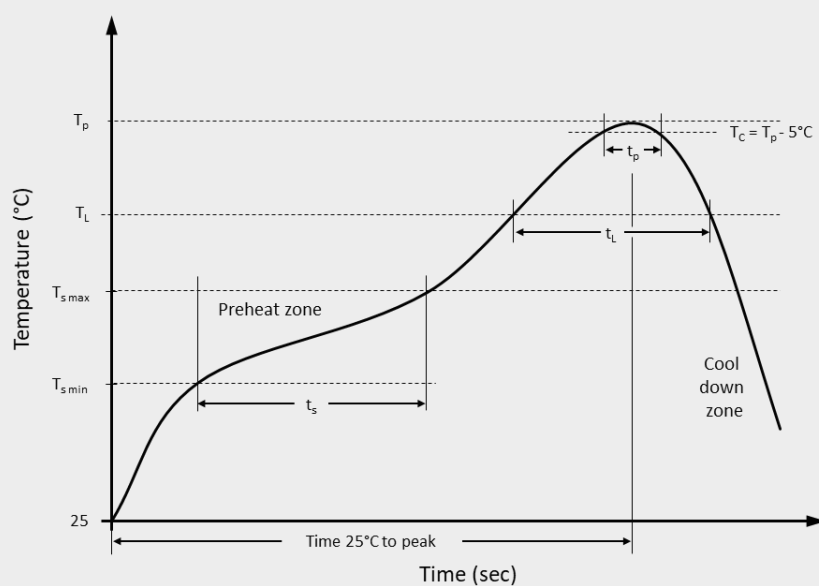
PIN DESCRIPTION AND PART NUMBER

CIRCUIT DIAGRAM	PIN DESCRIPTION	PART NO.	PACKAGE	PACKING
	1: Anode (+) • LED 2: Cathode (-) • LED 3: Drain • MOSFET 4: Drain • MOSFET	AB38 AB38F AB38S AB38F-R1 AB38S-R1	DIP-4 SMD-4 SOP-4 SMD-4 SOP-4	Tube (90pcs) Tube (90pcs) Tube (100pcs) Reel (1000pcs) Reel (1000pcs)
	1: Anode (+) • LED 2: Cathode (-) • LED 3: NC 4: Drain • MOSFET 5: Source • MOSFET 6: Drain • MOSFET	AA38 AA38F AA38F-R1	DIP-6 SMD-6 SMD-6	Tube (50pcs) Tube (50pcs) Reel (1000pcs)
	1: Anode (+) • LED 2: Cathode (-) • LED 3: Anode (+) • LED 4: Cathode (-) • LED 5~8: Drain • MOSFET	AC38 AC38F AC38S AC38F-R1 AC38S-R1	DIP-8 SMD-8 SOP-8 SMD-8 SOP-8	Tube (45pcs) Tube (45pcs) Tube (50pcs) Reel (1000pcs) Reel (1000pcs)

SPECIFICATIONS

ITEM		PERFORMANCE CHARACTERISTICS
Contact Form		1a / 2a
Load Voltage	V _L	600V
Operation LED Current	I _{F ON}	3.0mA
Load Current	I _L	80mA
On-Resistance	R _{ON}	40Ω
Output Capacitance	C _{OUT}	47pF
Low Off-State Leakage Current	I _{LEAK}	1.0μA

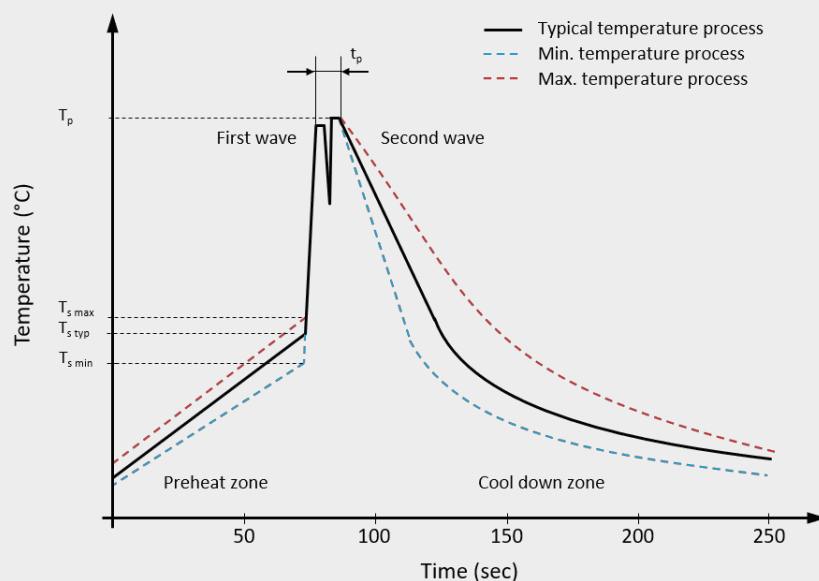
RECOMMENDED REFLOW SOLDERING PROFILE



RECOMMENDED REFLOW SOLDERING CONDITIONS

PROFILE FEATURES		PB-FREE ASSEMBLY
Preheat temperature min.	T _S MIN	150°C
Preheat temperature max.	T _S MAX	200°C
Preheat time T _S from T _S MIN to T _S MAX	T _S	120 seconds
Ramp-up rate (T _L to T _P)		max. 3°C / second
Liquidous temperature	T _L	217°C
Time T _L maintained above T _L	T _L	60 seconds max.
Peak package body temperature	T _P	260°C
Timeframe of within 5°C below and up to max actual peak body temperature	T _P	30 seconds max.
Ramp-down rate (T _L to T _P)		max. 6°C / second
Time 25°C to peak temperature		max. 8 minutes

RECOMMENDED WAVE SOLDERING PROFILE



CLASSIFICATION WAVE SOLDERING PROFILE

PROFILE FEATURES		VALUE • PB-FREE ASSEMBLY
Preheat temperature min.	$T_{s\ min}$	100°C
Preheat temperature typical	$T_{s\ typ}$	120°C
Preheat temperature max.	$T_{s\ max}$	130°C
Preheat time T_s from $T_{s\ min}$ to $T_{s\ max}$	T_s	70 seconds
Peak temperature	T_p	245°C ~ 260°C
Time of actual peak temperature	T_p	Max. 10 seconds Max. 5 second each wave
Ramp-down rate min.		~ 2°C / second
Ramp-down rate typical		~ 3.5°C / second
Ramp-down rate max.		~ 5°C / second
Time 25°C to 25°C		4 minutes

STORAGE AND HANDLING CONDITIONS

ESD LEVEL	FLOOR LIFE	CONDITION	MSL
HBM class 2	Unlimited	$T_A < 30^\circ\text{C}$, RH < 85%	3

ABSOLUTE MAXIMUM RATINGS 絕對最大定格 (Ambient Temperature 周圍溫度 : 25°C)

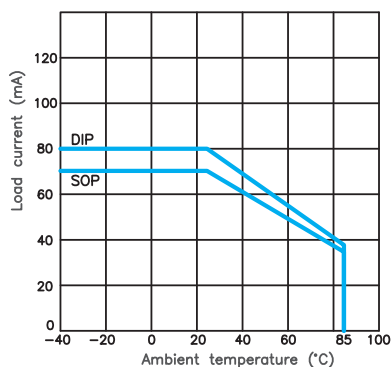
ITEM		CONDITION	SYMBOL	VALUE					UNIT
Outline Package				AB38S	AC38S	AB38(F)	AC38(F)	AA38(F)	
				1CH	2CH	1CH	2CH	1CH	
Input 輸入	Continuous LED Current 連續 LED 電流		I _F	50					mA
	Peak LED Current LED 峰值電流	f=100 Hz,Duty=1%	I _{FP}	500					mA
	LED Reverse Voltage 逆向 LED 電壓		V _R	5					V
	Input Power Dissipation 輸入損耗		P _{IN}	75					mW
Output 輸出	Load Voltage 負荷電壓		V _L	600 (AC peak or DC)					V
	Load Current 負荷電流		I _L	70	60	80	70	80	mA
	Peak Load Current 峰值負荷電流	1ms, 1 shot	I _{PEAK}	200	200	200	200	200	mA
	Output Power Dissipation 輸出損耗		P _{OUT}	300	450	450	600	450	mW
Relay 繼電器	Total Power Dissipation 全損耗		P _T	350	500	500	650	500	mW
	I/O Breakdown Voltage 入/出力間絕緣電壓		V _{I/O}	1500	1500	3750	3750	3750	V _{rms}
	I/O Breakdown Voltage 入/出力間絕緣電壓	Suffix-H	V _{I/O}	3750	3750	5000	5000	5000	V _{rms}
	Operating Temperature 使用時溫度		T _{OPR}	-40 ~ +85					°C
	Storage Temperature 保存溫度		T _{STG}	-40 ~ +100					°C

ELECTRICAL SPECIFICATIONS 電性規格 (Ambient Temperature 周圍溫度 : 25°C)

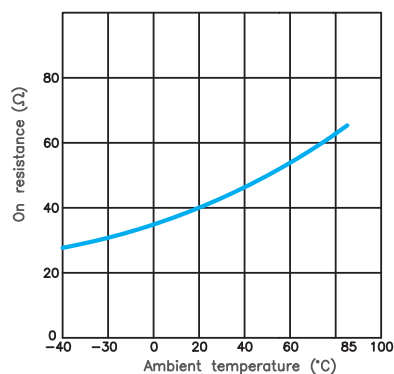
ITEM		CONDITION	SYM.	MIN.	TYP.	MAX.	UNIT
Input 輸入	LED Forward Voltage LED 順向電壓	I _F =10mA	V _F	1.0	1.17	1.5	V
	Operation LED Current LED 動作電流		I _{F ON}		1.0	3.0	mA
	Recovery LED Voltage LED 復位電壓		V _{F OFF}	0.5	1.0		V
Output 輸出	On-Resistance 導通電阻 Drain to Drain	I _F =5mA, I _L =Rating Time to flow is within 1sec.	R _{ON}		40	60	Ω
	Off-State Leakage Current 開路狀態漏電流	V _L =600V	I _{LEAK}			1.0	μA
	Output Capacitance 輸出端容量	V _L =0V, f=1MHz	C _{OUT}		47		pF
Trans- mission 傳達	Turn-On Time 動作時間	I _F =5mA I _L =Rating (for SOP type)	T _{ON}		0.2	0.5	ms
	Turn-Off Time 復位時間		T _{OFF}		0.15	0.5	ms
	Turn-On Time 動作時間	I _F =10mA I _L =Rating (for DIP/SMD type)	T _{ON}		0.1	1.0	ms
	Turn-Off Time 復位時間		T _{OFF}		0.15	0.5	ms
Coupled 結合	I/O Insulation Resistance 輸入/ 出間絕緣阻抗		R _{I/O}	10 ⁹			Ω
	I/O Capacitance 輸入/ 力端靜電容量	f=1MHz	C _{I/O}		1.3		pF

REFERENCE DATA

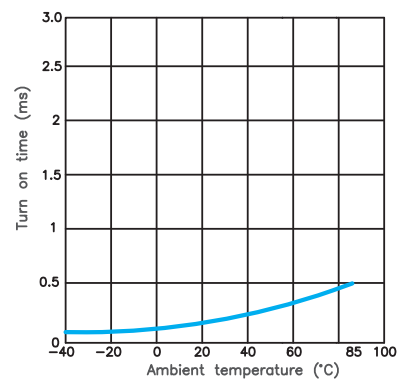
Load current vs. Ambient temp.



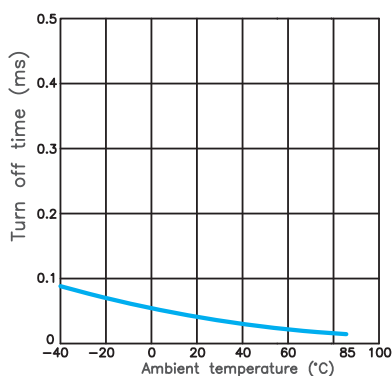
On resistance vs. Ambient temp.



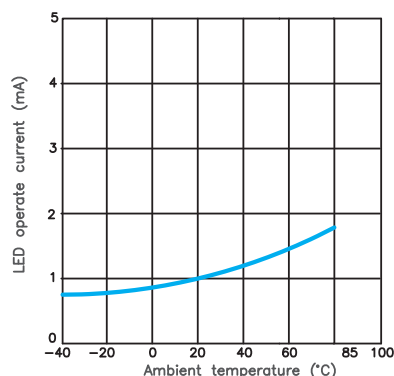
Turn on time vs. Ambient temp.



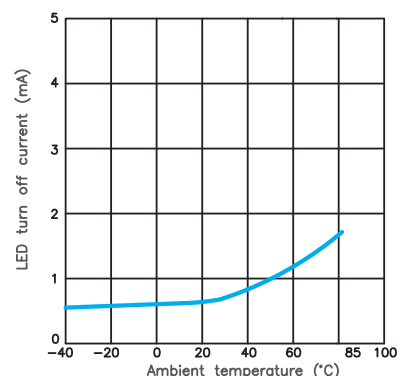
Turn off time vs. Ambient temp.



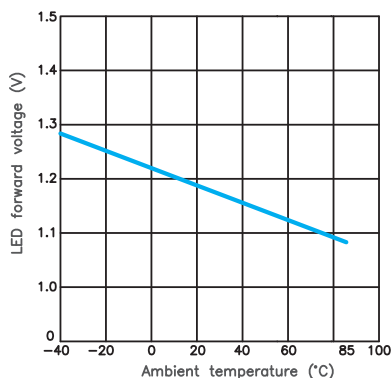
LED operate current vs. Ambient temp.



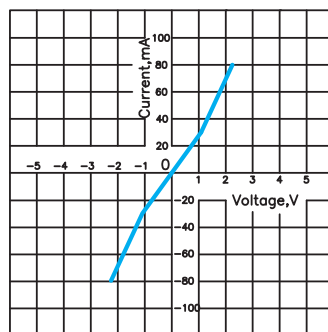
LED turn off current vs. Ambient temp.



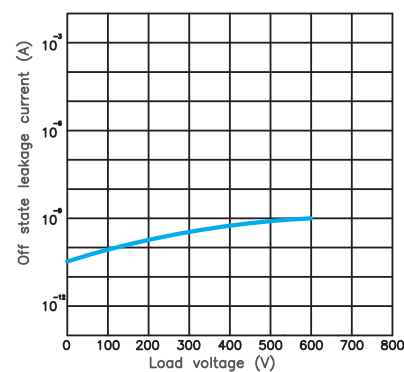
LED forward voltage vs. Ambient temp.



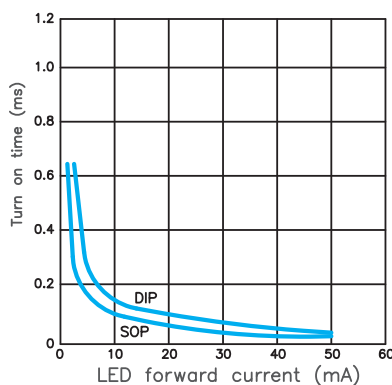
Current vs. Voltage characteristics of output at MOS portion



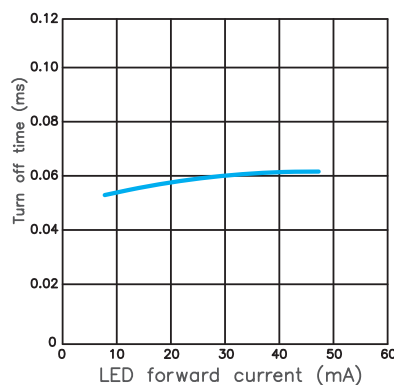
Off state leakage current vs. Load voltage



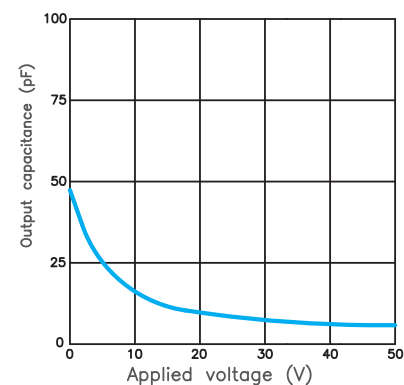
Turn on time vs. LED forward current



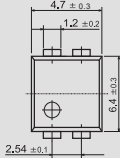
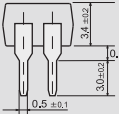
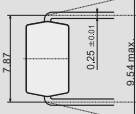
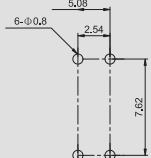
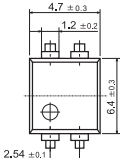
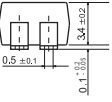
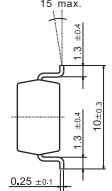
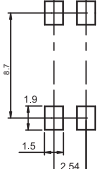
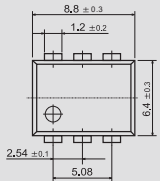
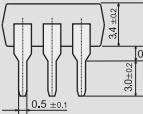
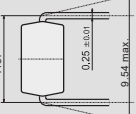
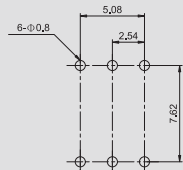
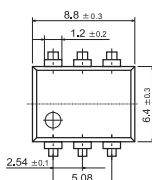
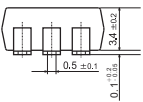
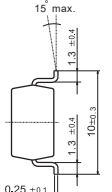
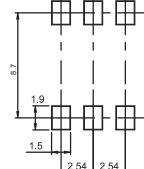
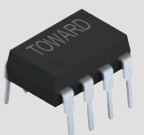
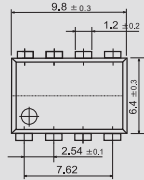
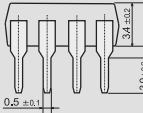
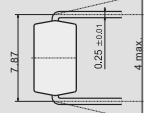
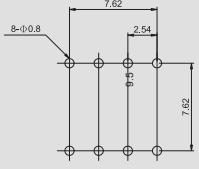
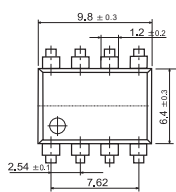
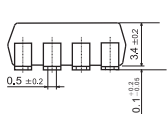
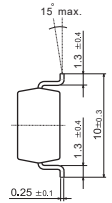
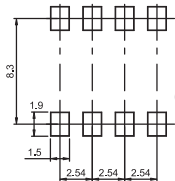
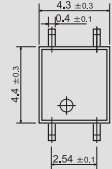
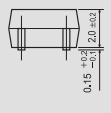
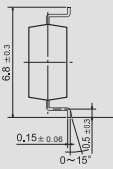
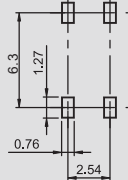
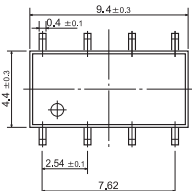
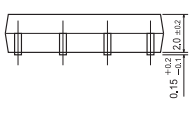
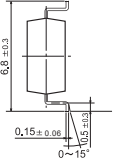
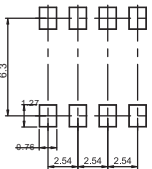
Turn off time vs. LED forward current



Output capacitance vs. Applied voltage



PACKAGE & PC BOARD PATTERN

PACKAGE	DIMENSIONS			PC BOARD PATTERN
 DIP4				 (Bottom View)
 SMD4				 (Top View)
 DIP6				 (Bottom View)
 SMD6				 (Top View)
 DIP8				 (Bottom View)
 SMD8				 (Top View)
 SOP4				 (Top View)
 SOP8				 (Top View)

PACKING SPECIFICATIONS

PACKAGE TYPE 包裝類型	TAPE SHAPE & DIMENSIONS 形狀和尺寸	REEL SHAPE & DIMENSIONS 圖帶形狀和尺寸	QUANTITY 數量
4 Pin SOP			1000 pcs
8 Pin SOP			1000 pcs
4 Pin SMD			1000 pcs
6 Pin SMD			1000 pcs
8 Pin SMD			1000 pcs

LOAD CONNECTING METHOD

TYPE 類型	LOAD 負荷	CONNECTION 接續方法	FEATURE 特長
4 Pin	AC or DC		Control bi-directional signal 可控制雙向信號
6 Pin	A AC or DC		Control bi-directional signal 可控制雙向信號
	B DC		On-Resistance is 1/2 of A-connection 導通電阻值是A接法的1/2 2-Make-contacts (Source Common)
	C DC		On-Resistance is 1/2 of B-connection 導通電阻值是B接法的1/2 導通電阻值是A接法的1/4
8 Pin	AC or DC		2 input and 2 output 2 入力和2 出力回路
			1 input and 2 output 1 入力和2 出力回路