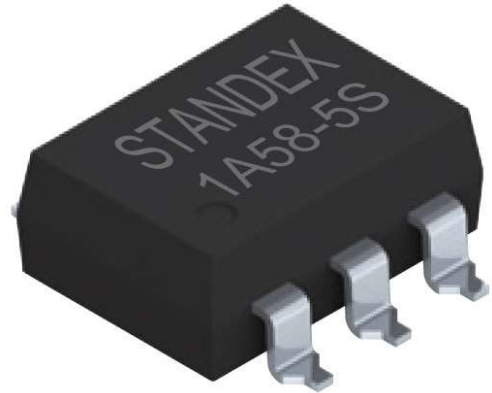


58 Series Photo-MOSFET Relay

- Features: High Voltage SiC Photo MOSFET Relay, switching up to 1800 VDC/Peak AC with Low On-Resistance
- Improved Leakage Current at High Temperature
- THT or SMD, High I/O Isolation
- Tested in accordance with AEC-Q101, UL listed, RoHS Compliance
- Applications: EV/Battery Management Systems, I/O Modules, Sensing Equipment, Solar
- Markets: Battery Management System, Energy Storage System, Telecomm, Test & Measurement, Security



Part Description: SMP-XA58-5XX-X

Number of Poles	Contact Form	Series Number	Number of Pins	Mounting Type	Package Style	Special Features
1	A	58	5	D, S	Tube, Reel	Nil, Q, R

See page 3 for Glossary

Maximum Ratings @ Ambient Temperature = 25°C

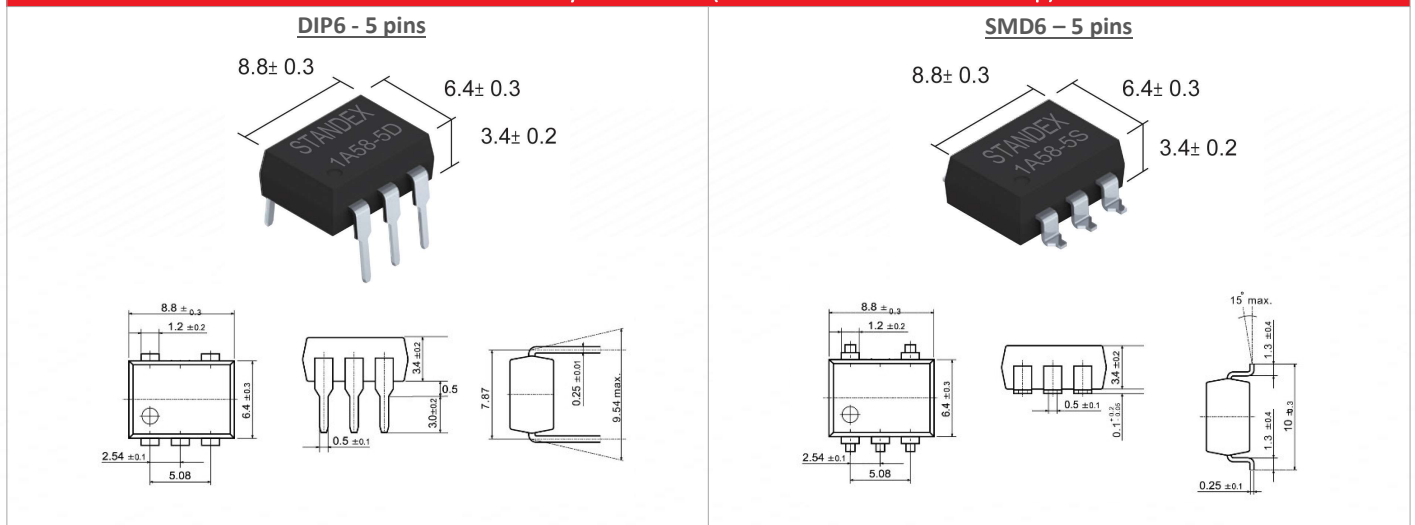
Parameters	Symbol	Value	Units	Condition
		1A58-5D, S		
INPUT SPECIFICATIONS				
Continuous LED Current	I_F	50	mA	-
Peak LED Current	I_{FP}	500	mA	f=100Hz, 1% Duty Cycle
LED Reverse Voltage	V_R	5	V	-
Input Power Dissipation	P_{IN}	75	mW	-
OUTPUT SPECIFICATIONS				
Load Voltage	V_L	1800	DC or Peak AC	-
Load Current	I_L	30	mA	-
Peak Load Current	I_{PEAK}	80	mA	1 ms, 1 shot
Output Power Dissipation	P_{OUT}	450	mW	-
GENERAL SPECIFICATIONS				
Total Power Dissipation	P_T	500	mW	-
I/O Breakdown Voltage	$V_{I/O}$	3750	V_{RMS}	-
I/O Breakdown Voltage	$V_{I/O}$	5000	V_{RMS}	Suffix R
Operating Temperature	T_{OPR}	-40/+85	°C	-
Storage Temperature	T_{STG}	-40/+100	°C	-

58 Series Photo-MOSFET Relay

Ratings @ Ambient Temperature = 25°C

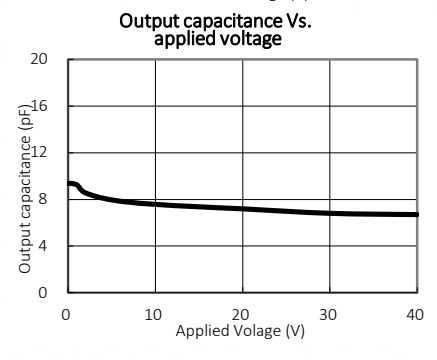
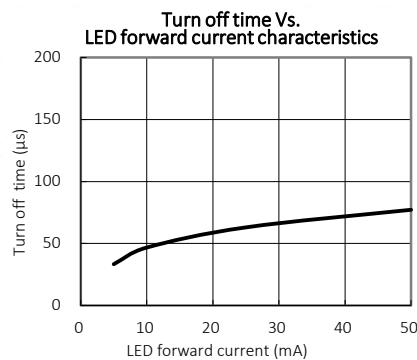
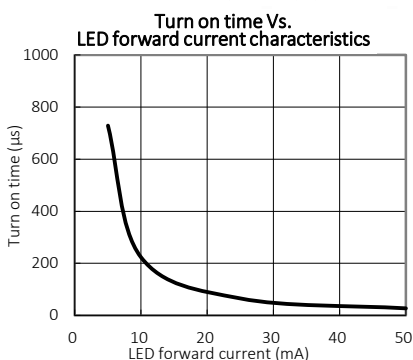
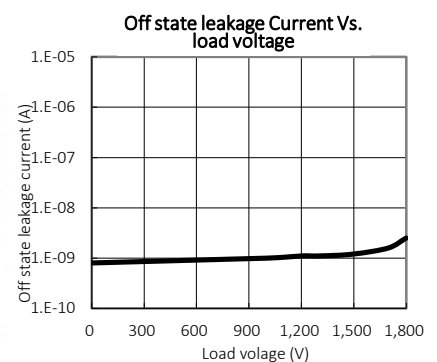
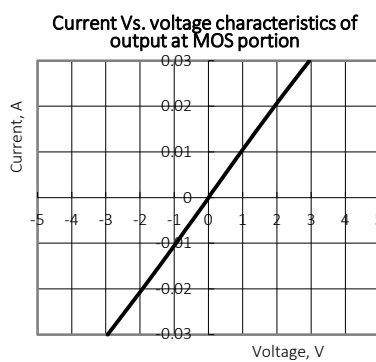
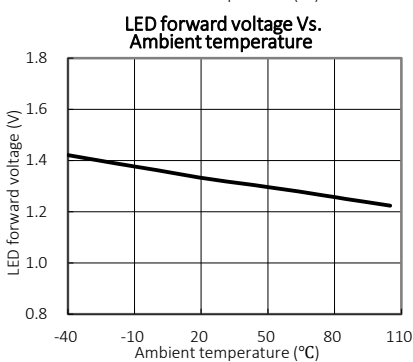
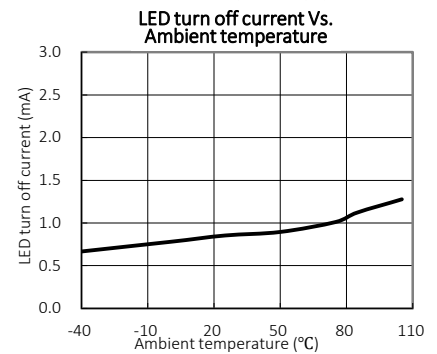
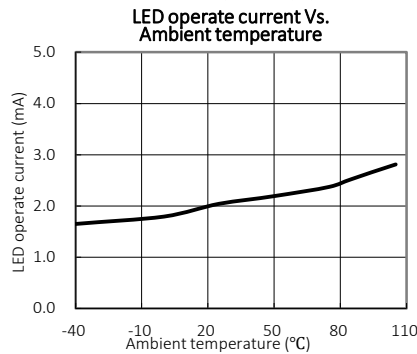
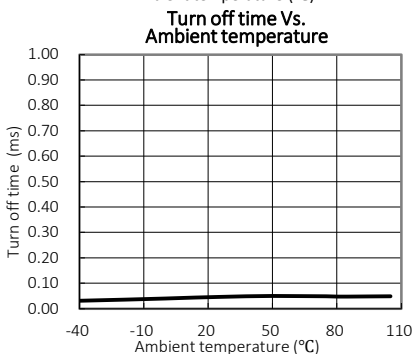
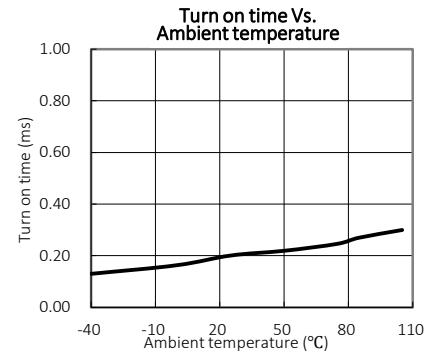
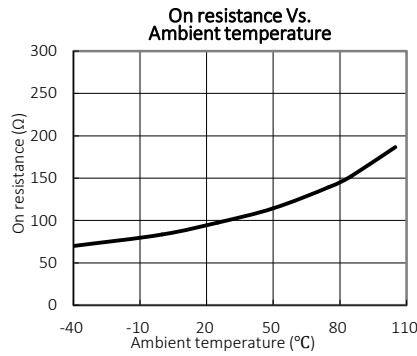
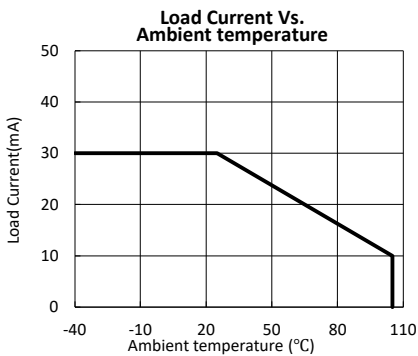
Parameters	Symbol	Min	Typ	Max	Units	Condition
INPUT SPECIFICATIONS						
LED Forward Voltage	V_F	1.0	1.33	1.5	V	$I_F = 10\text{mA}$
Operation LED Current	$I_{F\text{ ON}}$	-	2.0	5.0	mA	-
Recovery LED Voltage	$V_{F\text{ OFF}}$	0.5	1.2	-	V	-
OUTPUT SPECIFICATIONS						
On Resistance: Drain to Drain (tested within 1 sec.)	R_{ON}	-	120	200	Ω	$I_F = 10\text{mA}, I_L = \text{Rating}$
	R_{ON}	-	100	180	Ω	$I_F = 10\text{mA}, I_L < 5\text{mA}$
Off-State Leakage Current	I_{LEAK}	-	-	1	μA	$V_L = 1500\text{V @ } 25^\circ\text{C}$
	I_{LEAK}	-	-	10	μA	$V_L = 1800\text{V @ } 25^\circ\text{C}$
	I_{LEAK}	-	-	10	μA	$V_L = 1000\text{V @ } 85^\circ\text{C}$
Output Capacitance	C_{OUT}	-	10	-	ρF	$V_L = 0\text{V}, f = 1\text{MHz}$
TRANSMISSION SPECIFICATIONS						
Turn-On Time	T_{ON}	-	0.2	3.0	ms	$I_F = 10\text{mA}, I_L = \text{Rating}$
Turn-Off Time	T_{OFF}	-	0.06	1.0	ms	
COUPLED SPECIFICATIONS						
I/O Insulation Resistance	$R_{\text{I/O}}$	10^{10}	-	-	Ω	-
I/O Capacitance	$C_{\text{I/O}}$	-	1.3	-	ρF	$f = 1\text{MHz}$

Photo-MOSFET Relay Dimensions (Tolerances acc. to ISO 2768-mp)



58 Series Photo-MOSFET Relay

Photo MOSFET Relay Reference Data



58 Series Photo-MOSFET Relay

Photo MOSFET Relay Recommended PCB Pad Layout (Tolerances acc. to ISO 2768-mp)

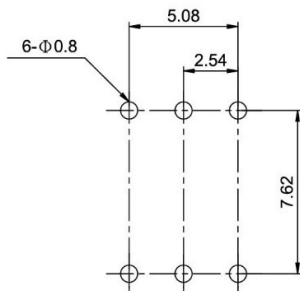
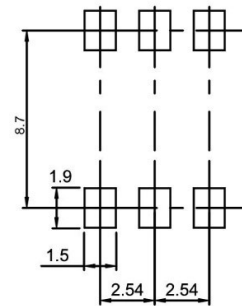
DIP6 (Bottom View)

SMD6 (Top View)


Photo MOSFET Relay Tape & Reel Packaging (1,000 pcs per reel) / THT Packaging (50 pcs per tube)

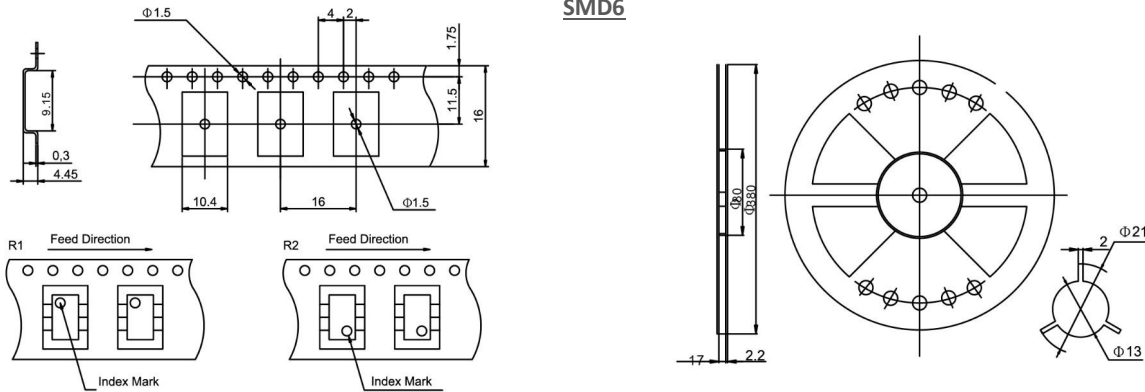
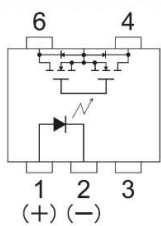
SMD6


Photo MOSFET Relay Pin-Out (Top View)


5 PIN

- 1: Anode (LED)
- 2: Cathode (LED)
- 3: NC
- 4,6: Drain (MOS FET)
- 5: NC

Glossary Options

D	DIP (Dual-In-Line Package)
S	SMD (Surface Mount Design)
P	SOP (Small-Outline Package)
Q	AEC-Q101 / High Temperature
R	Reinforced Isolation

Please note: All technical specifications in this series datasheet refer to the standard product range. Modifications in the sense of technical progress are reserved. For general information only. For more specific information, please consult the product datasheet, available upon request.

This series datasheet could contain technical inaccuracies or typographical errors. Changes are periodically made to the information herein. These changes will be incorporated in future revisions.

For deviating values, latest specifications and product details, please contact your nearest sales office.

58 Series Photo-MOSFET Relay – AEC-Q101 Test Report

Test Item		Test Condition	Sample Size per Lot	Result
Preconditioning	PC	Bake : MSL_3 : 125°C, 24hrs Soak : MSL_3 : 60°C, 60%RH Reflow : MSL_3 : 260°C, 3 times	77*6 lot (Total 462 ea)	Pass
External Visual	EV	Inspect part construction, marking and workmanship	77*6 lot (Total 462 ea)	Pass
High Temperature Reverse Bias	HTRB	125C, total :1000H, Readout: 168/500/1000hr	77*3 lot (Total 231 ea)	Pass
Temperature Cycling	TC	TCT : -40~125/10min,trans:5min, 1cyc=30min, 500 hrs (Readout:500/1000 cyc)	77*3 lot (Total 231 ea)	Pass
Temperature Cycling Hot Test	TCHT	Decapsulation(Others) for TCHT' after TCDT	5 ea	Pass
TC Delamination Test	TCDT	After TCT 100% C-SAM Required for MOSFETs parts with internal bond wire sizes 5 mil diameter and less.	77*3 lot (Total 231 ea)	Pass
Unbiased Highly Accelerated Stress Test	UHASt	130C/85% for 96 hrs	77*3 lot (Total 231 ea)	Pass
High Humidity High Temperature Reverse Bias	H3TRB	85°C/85% RH, total :1000H, Readout: 168/500/1000hr	77*3 lot (Total 231 ea)	Pass
Power Temperature Cycle	PTC	TCT : -40~125/10min,trans:30min, for 1000 hrs, 1cyc=80min, 750cyc, 5min on/5min off 6000cys Readout : 375 cycle	77*3 lot (Total 231 ea)	Pass
ESD Characterization	ESD	> 2000V Level per pins HBM *Reference AEC-Q101-001	10*3 lot (Total 30 ea)	Pass
		CDM *Reference AEC-Q101-005	10*3 lot (Total 30 ea)	Pass
Destructive Physical Analysis	DPA	Decapsulation OM	2 ea	Pass
Physical Dimensions	PD	Reference JESD22 B-100	30*1 lot (Total 30 ea)	Pass
Terminal Strength	TS	Reference to MIL-750 2036. Leaded device only	30*1 lot (Total 30 ea)	Pass
Resistance to Solder Heat	RSH	270°C± 5°C +2/-0 seconds *Reference JESD22 B-106	30*1 lot (Total 30 ea)	Pass
Solderability	SD	Aging:93C.8hr 245°C 5 seconds Magnification 50x, *Reference J-STD-002JESD22B102	10*1 lot (Total 10 ea)	Pass
High Temperature Forward Bias	HTFB	105°C , IF=10mA, 1000h	77*3 lot (Total 231 ea)	Pass
High Temperature High Humidity Bias	HTHHB	85°C 85%RH, IF=20mA, 1000h	77*3 lot (Total 231 ea)	Pass