

## **Photo DMOS-FET Relay**

### **Description**

LT211SC is a miniature 1-Form A solid-state relay with a built-in current limiting protection circuit. It is packaged in a 4-pin SOP package and utilizes optically coupled MOSFET technology to provide 1500V of input-to-output isolation. The optically coupled input is controlled by a highly efficient GaAlAs infrared LED, and the output side is managed by MOSFETs.

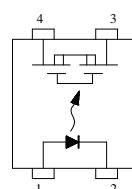
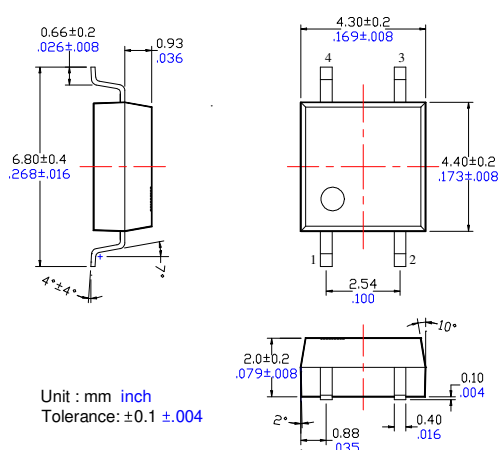
### **Features**

- SOP package 4 Pin type in miniature design (4.4×4.3×2.0mm / .173×.169×.083inch)
- Low driver power requirements (TTL/CMOS Compatible)
- Short circuit protection (Latch type)
- No moving parts
- High reliability
- Arc-Free with no snubbing circuits
- 1500Vrms Input/Output isolation
- Tape & Reel version available

### **Applications**

- Telecommunications (PC, Electronic notepad)
- Measuring and Testing equipment
- Industrial control
- Security equipments
- High speed inspection machine

### **Outline Dimensions**



1. LED Anode
2. LED Cathode
- 3, 4. Drain (MOS FET)

# Photo DMOS-FET Relay Specifications

**Part Name: LT211SC**

(Load voltage: 350V / Load current: 120mA)

## Absolute Maximum Ratings (Ambient Temperature: 25°C)

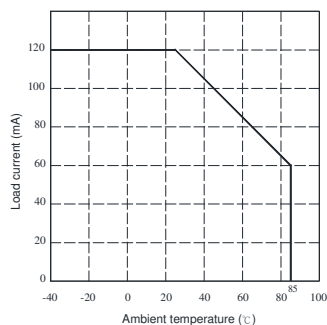
Item		Symbol	Value	Units	Note
Input	Continuous LED Current	I <sub>F</sub>	50	mA	
	Peak LED Current	I <sub>FP</sub>	1000	mA	f=100Hz, duty=1%
	LED Reverse Voltage	V <sub>R</sub>	5	V	
	Input Power Dissipation	P <sub>In</sub>	75	mW	
Output	Load Voltage	V <sub>L</sub>	350	V(AC peak or DC)	
	Load Current	I <sub>L</sub>	120	mA	
	Peak Load Current	I <sub>Peak</sub>	0.6	A	100ms(1 pulse)
	Output Power Dissipation	P <sub>out</sub>	300	mW	
Total Power Dissipation		P <sub>T</sub>	350	mW	
I/O Breakdown Voltage		V <sub>I/O</sub>	1500	V <sub>rms</sub>	RH=60%, 1min
Operating Temperature		T <sub>Opr</sub>	-40 to +85	°C	
Storage Temperature		T <sub>Stg</sub>	-40 to +100	°C	
Pin Soldering Temperature		T <sub>Sol</sub>	260	°C	10 sec max.

## Electrical Specifications (Ambient Temperature: 25°C)

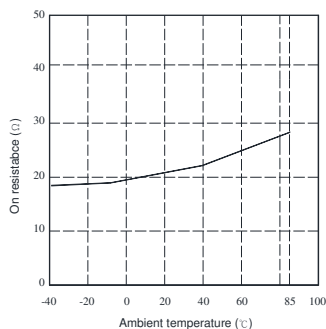
Item		Symbol	MIN.	TYP.	MAX.	Units	Conditions
Input	LED Forward Voltage	V <sub>F</sub>		1.2	1.4	V	I <sub>F</sub> =10mA
	Operation LED Current	I <sub>F On</sub>		0.5	2.0	mA	
	Recovery LED Current	I <sub>F Off</sub>		0.35	0.5	mA	
	Recovery LED Voltage	V <sub>F Off</sub>	0.7			V	
Output	On-Resistance	R <sub>On</sub>		22	28	Ω	I <sub>F</sub> =5mA, I <sub>L</sub> =100mA, Time to flow is within 1 sec.
	Off-State Leakage Current	I <sub>Leak</sub>			1	uA	V <sub>L</sub> =Rating
	Output Capacitance	C <sub>Out</sub>		41		pF	V <sub>L</sub> =0, f=1MHz
	<b>Over current protection</b>						
	Cut off current	I <sub>shut</sub>		180	240	mA	I <sub>F</sub> = 5 mA Within 5ms on time
Transmis sion	Turn-On Time	T <sub>On</sub>		0.3	0.5	ms	I <sub>F</sub> =5mA, I <sub>L</sub> =100mA,
	Turn-Off Time	T <sub>Off</sub>		0.05	0.2	ms	
Coupled	I/O Isolation Resistance	R <sub>I/O</sub>	10 <sup>10</sup>			Ω	DC500V
	I/O Capacitance	C <sub>I/O</sub>		0.8	1.5	pF	f=1MHz

## Reference Data

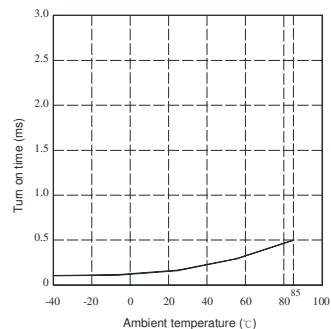
Load current Vs.  
Ambient temperature



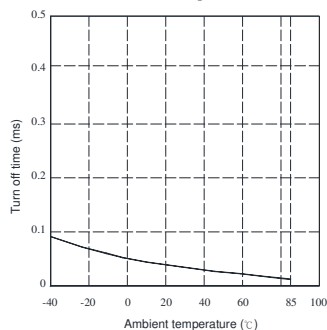
On resistance Vs.  
Ambient temperature



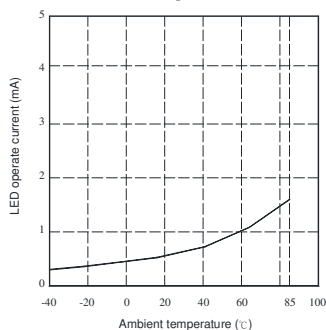
Turn on time Vs.  
Ambient temperature



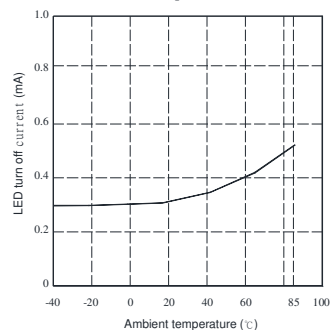
Turn off time Vs.  
Ambient temperature



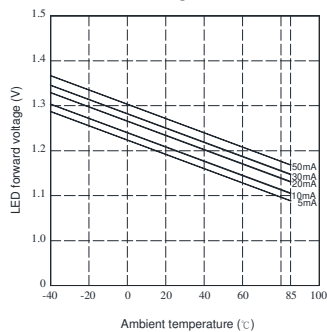
LED operate current Vs.  
Ambient temperature



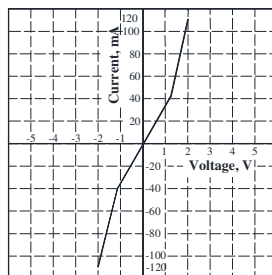
LED turn off current Vs.  
Ambient temperature



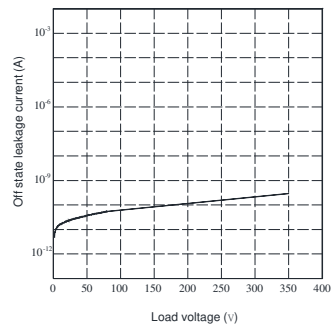
LED forward voltage Vs.  
Ambient temperature



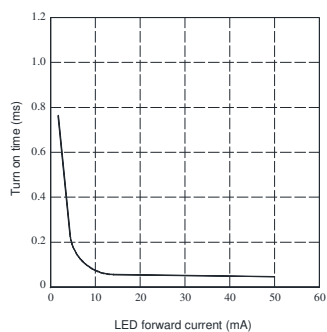
Voltage Vs. current characteristics  
of output at MOS portion



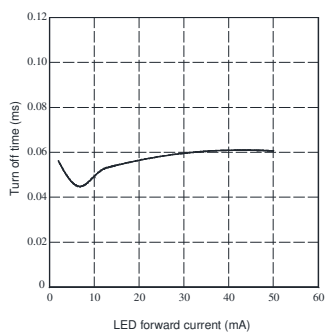
Off state leakage current Vs.  
Load voltage characteristics



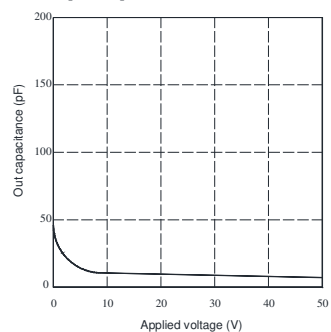
LED forward current Vs.  
turn on time characteristics

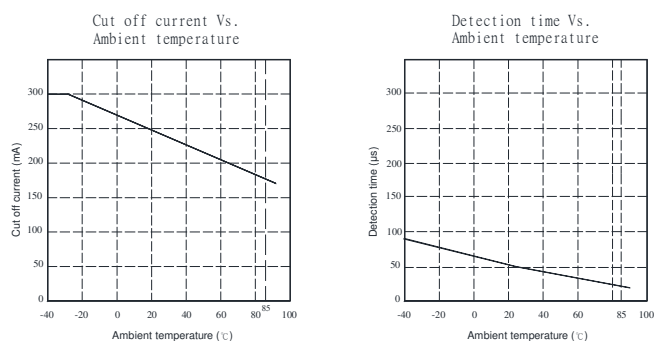


LED forward current Vs.  
turn off time characteristics



Applied voltage Vs.  
output capacitance characteristics





### ●RECOMMENDED OPERATING CONDITIONS

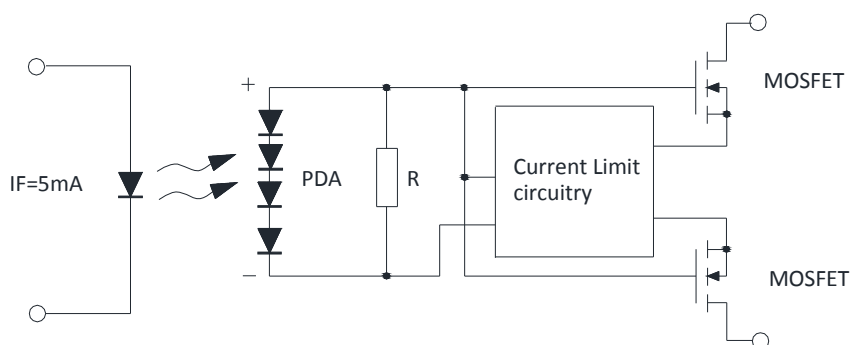
Please following conditions to ensure proper device operation and resetting.

Item	Symbol	Recommended value	Unit
Input LED current	IF	5~10	mA

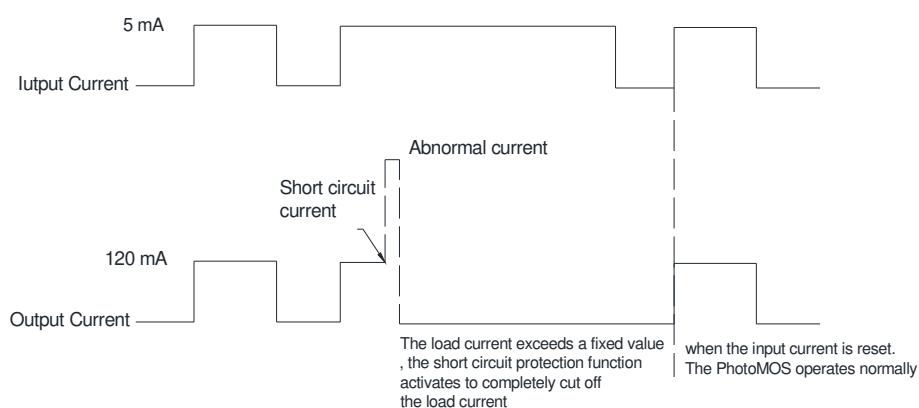
## Relay Protection

The Photo DMOS Relay is equipped with a built-in active current limiting circuit for short-circuit protection. When the output current exceeds the rated value, it will instantaneously (typically 50 us) completely cut off the load current and maintain it in the off state. This not only protects the Relay itself but also safeguards the output circuit from the effects of faults. Subsequently, you can turn off the input current to restore the Relay to its normal operational state.

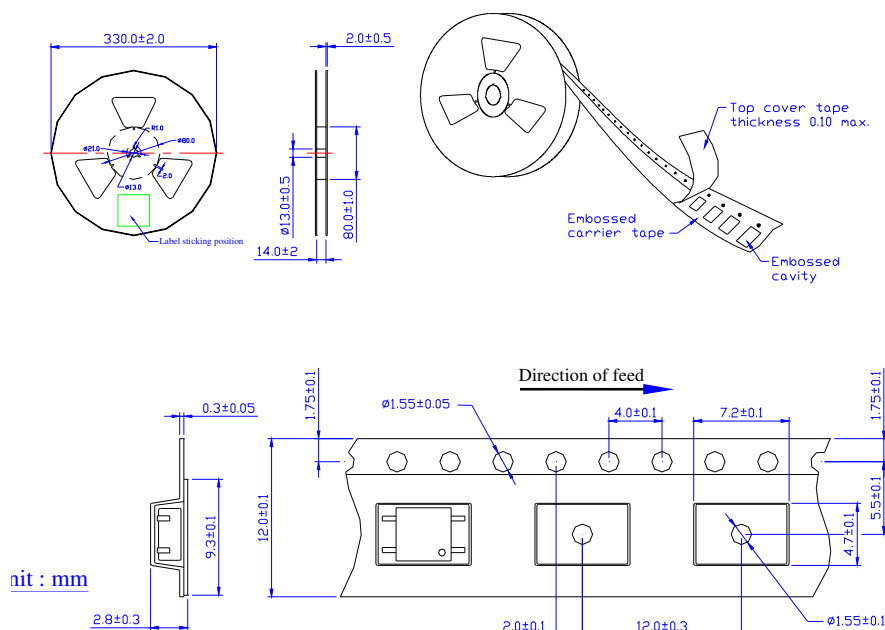
## Current Limit Schematic



## Action flow chart

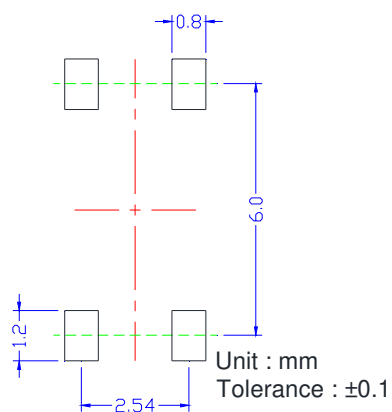


## Taping Specifications for Surface Mount Devices



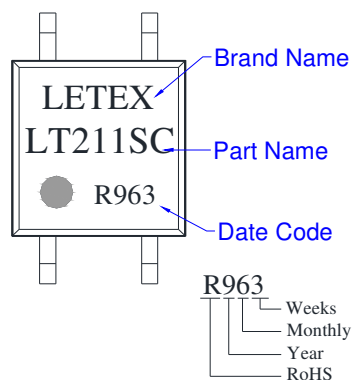
### Recommended Mounting Pad

(Top view)



### Marking

(Each photo MOS Relay shall be marked with the following information)



- Note: 1. There shall be leader of 230 mm minimum which may consist of carrier and or cover tape follower by a minimum of 160 mm of carrier tape sealed with cover tape.
2. There shall be a minimum of 160 mm of empty component pockets sealed with cover tape.
3. Devices are pockets in accordance with EIA standard EIA-481-A and specifications given above.
4. Packaging: 2,000pcs per reel, 2 reel per box, 5 boxes per carton.