Photo DMOS-FET Relay

Description

The **LT237** is a miniature 1-Form A solid state relay in a 4 pin SOP package that employs 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 MOS FETs on the output side.

(Operating Temperature 工作溫度-40 ~ +105 時負載電流 350mA Max.)

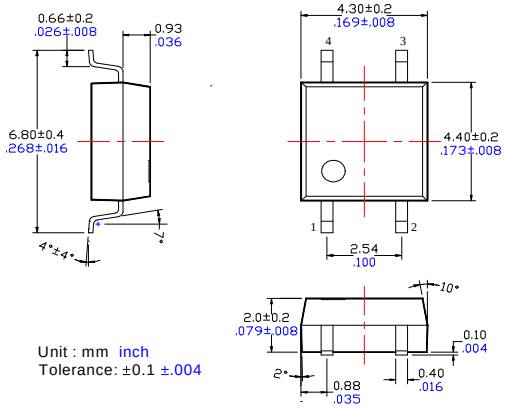
Features

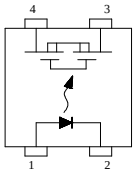
- SOP package 4 Pin type in miniature design (4.4×4.3×2.0mm / .173×.169×.083inch)
- Low driver power requirements (TTL/CMOS Compatible)
- No moving parts
- High reliability
- Arc-Free with no snubbing circuits
- 1500Vrms Input/Output isolation
- UL NO. E222222 approved
- Tape & Reel version available

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: LT237

(Load voltage: 60V / Load current: 350mA)

Absolute Maximum Ratings (Ambient Temperature: 25℃)

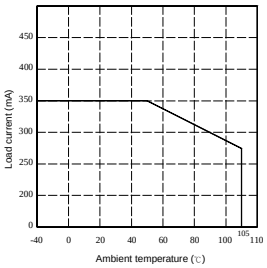
Item		Symbol	Value	Units	Note
Input	Continuous LED Current	I_F	50	mA	
	Peak LED Current	I_{FP}	1000	mA	f=100Hz, duty=1%
	LED Reverse Voltage	V_R	5	V	
	Input Power Dissipation	P_{In}	75	mW	
Output	Load Voltage	V_L	60	V(AC peak or DC)	
	Load Current	I_L	350	mA	
	Peak Load Current	I_{Peak}	4.0	A	100ms(1 pulse)
	Output Power Dissipation	Pout	350	mW	
Total Power Dissipation		P_T	400	mW	
I/O Breakdown Voltage		$V_{I/O}$	1500	Vrms	RH=60%, 1min
Operating Temperature		T_{opr}	-40 to +105	℃	
Storage Temperature		T_{stg}	-40 to +100	℃	
Pin Soldering Temperature		T_{sol}	260	℃	10 sec max.

Electrical Specifications (Ambient Temperature: 25℃)

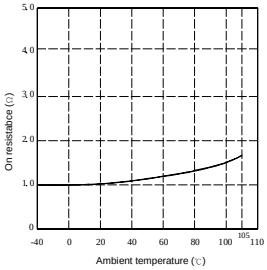
Item		Symbol	MIN.	TYP.	MAX.	Units	Conditions
Input	LED Forward Voltage	V_F		1.2	1.4	V	I_F=10mA
	Operation LED Current	$I_{F\ on}$		0.5	2.0	mA	
	Recovery LED Current	$I_{F\ off}$		0.35	0.5	mA	
	Recovery LED Voltage	$V_{F\ off}$	0.7			V	
Output	On-Resistance	R_{on}		0.13	0.5	Ω	I_F=5mA,I_L=100mA, Time to flow is within 1 sec.
	Off-State Leakage Current	I_{Leak}			1.0	uA	V_L=Rating
	Output Capacitance	C_{out}			115	pF	V_L=0, f=1MHz
Transmission	Turn-On Time	T_{on}		1.0	1.3	ms	I_F=5mA, I_L=100mA,
	Turn-Off Time	T_{off}		0.6	0.8	ms	
Coupled	I/O Isolation Resistance	$R_{I/O}$	10^{10}			Ω	DC500V
	I/O Capacitance	$C_{I/O}$		0.8	1.5	pF	f=1MHz

Reference Data

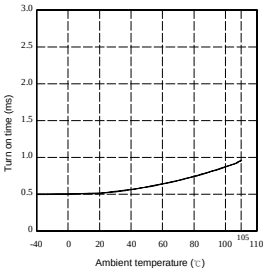
Load current Vs.
Ambient temperature



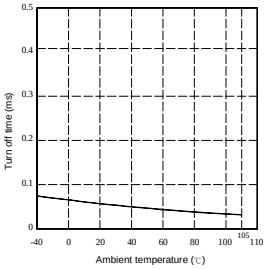
On resistance Vs.
Ambient temperature



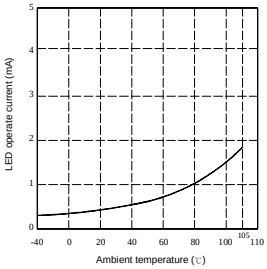
Turn on time Vs.
Ambient temperature



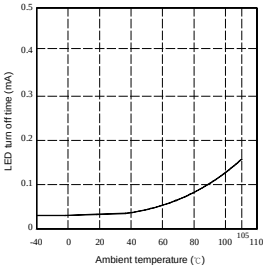
Turn off time Vs.
Ambient temperature



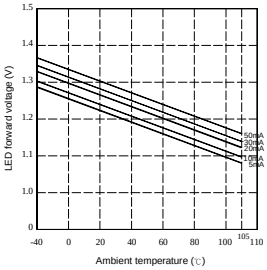
LED operate current Vs.
Ambient temperature



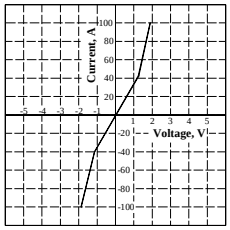
LED turn off current Vs.
Ambient temperature



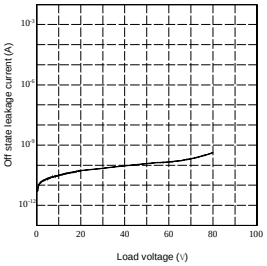
LED forward voltage Vs.
Ambient temperature



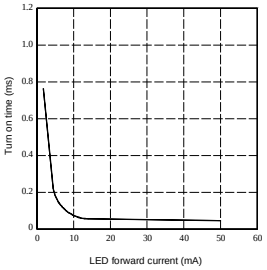
Voltage Vs. currennt characteristics
of output at MOS portion



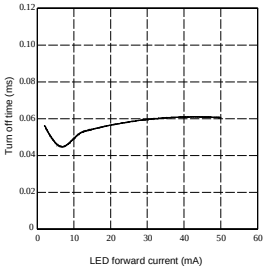
Off state leakage current Vs.
Load voltage characteristics



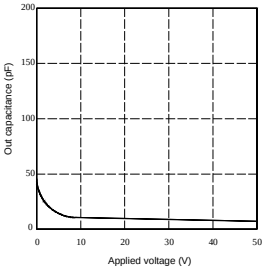
LED foward current Vs.
turn on time characteristics



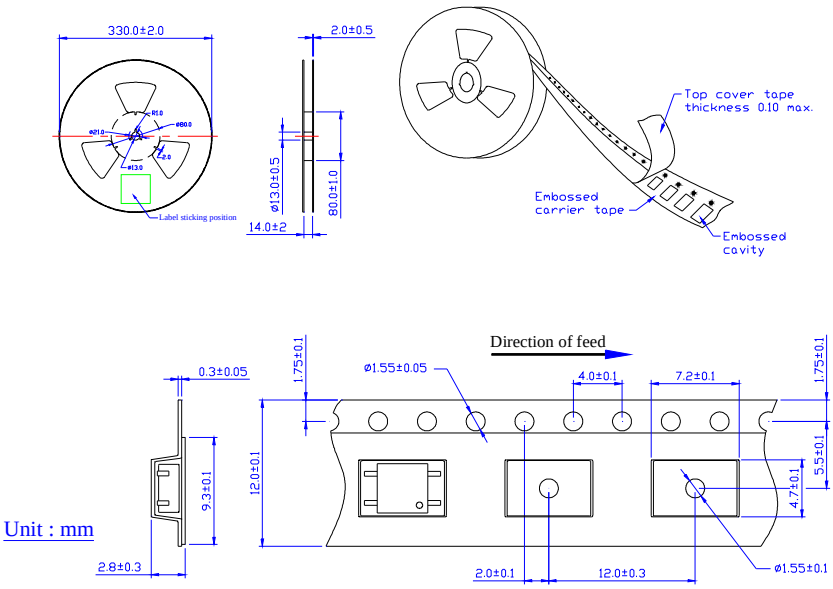
LED foward current Vs.
turn off time characteristics



Applied voltage Vs.
output capacitance characteristics

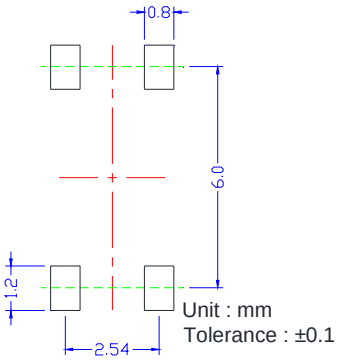


Taping Specifications for Surface Mount Devices



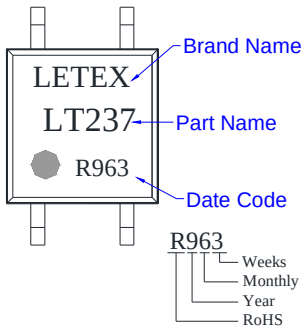
Recommended Mounting Pad

(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.

Photo MOS relay 信賴性試驗 / RELIABILITY GUARANTEE CRITERION

	試驗項目/ Item	試驗方法 Test Method		試驗條件/ Test conditions	Sample Q'ty	Ac / Re
		IEC 68	JIS C			
1	常溫連續動作試驗 Room temp continuous operation test	-	-	Ta=25℃ IF=50mA IL=800mA. / VL=60V t=1000H	40	0 / 1
2	高溫連續動作試驗 High temp continuous operation test	-	0021	Ta=105℃ IF=20mA IL=350mA / VL=60V t=1000H	40	0 / 1
3	高溫保存試驗 High temp storage test	2-2	0021	Ta=125℃ VR=5V Voff=80% / VL=Max.*80% t=1000H	40	0 / 1
4	低溫保存試驗 Low temp storage test	2-1	0020	Ta=-40℃ VR=5V Voff=80% / VL=Max.*80% t=1000H	40	0 / 1
5	高溫高溼保存試驗 High temp/High humidity storage test	2-3	0022	Ta=85℃, RH=85% VR=5V Voff=80% / VL=Max.*80% t=1000H	40	0 / 1
6	溫度循環試驗 Temp cycling test	-	0025	階段 / 溫度 / 時間 1 / -40℃ / 30min 2 / 25℃ / 5min 3 / 105℃ / 30min 4 / 25℃ / 5min 100 cycles	40	0 / 1
7	高溫高壓試驗(PCT) Pressure cooker test	2-66	-	Ta=121℃, RH=100% 2atm, Bias, t=100H	40	0 / 1
8	端子強度試驗 Terminal strength test	2-21	0051	Weight due to the terminal: 5N t= 30sec.	40	0 / 1
9	端子曲折試驗 Terminal bend test	2-21	0051	Bend the terminal with 125g at 90 degree angle, 2 times	40	0 / 1
10	錫焊性試驗 Solderability test	-	0050	Solder: 230±5℃ t= 5 sec.	40	0 / 1
11	錫焊耐熱性試驗 Solderability heat resistance test	-	-	Solder: 260±5℃ t= 10 sec.	40	0 / 1