Description

The EL6xxA is solid state relays containing an AlGaAs infrared LEDs on the light emitting side (input side) optically coupled to a high voltage output detector circuit. The detector consists of a photovoltaic diode array and MOSFETs on the output side. The single channel configuration is equivalent to 1form A EMR. The devices in a 6-pin small outline DIP package and 6-pin SMD package.

Features

- Normally open signal pole signal throw relay
- Low operating current
- 60 to 600V output withstand voltage
- Wide operating temperature range of -40°C to 85°C
- High input-output isolation voltage(Viso= 5,000Vrms)
- RoHS

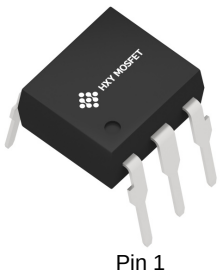
Applications

- Measurement equipment
- Exchange equipment
- FA/OA equipment
- Security
- Industrial controls

Package Marking and Ordering Information

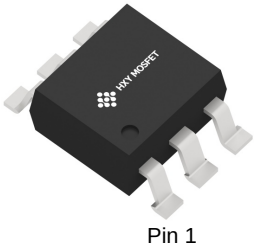
Product ID	Pack	Qty(PCS)	Packaging
EL6xxA	DIP-6	65	Tube
EL6xxA	SMD-6	2000	Reel

xx: From 06, 40, 60



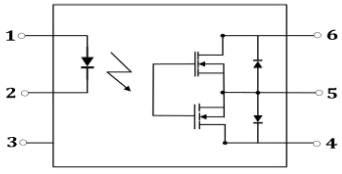
Pin 1

DIP-6



Pin 1

SMD-6



Pin Configuration
1. AN
2. CA
3. N/CO
4. D1
5.Source
6. D2

Maximum Ratings

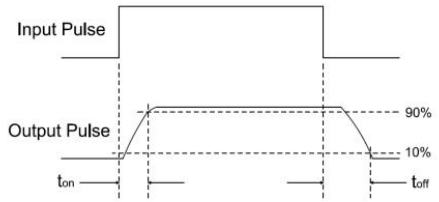
Parameter		Symbol	Values		Unit
Input	Forward Current	I_F	50		mA
	Reverse Voltage	V_R	6		V
	Power Dissipation	P	75		MW
	Peak Forward Current (100μs pulse, 100Hz)	I_{FP}	1		A
	Thermal Resistance Junction-Ambient	R_{thJ-A}	325		°C/W
	Thermal Resistance Junction-Case	R_{thJ-C}	200		°C/W
Output	Break Down Voltage	V_L	EL606A	60	V
			EL640A	400	
			EL660A	600	
	Continuous Load Current	I_L	EL606A	550	mA
			EL640A	120	
			EL660A	50	
	Pulse Load Current*(1)	I_{LPeak}	EL606A	1.2	A
			EL640A	0.3	
			EL660A	0.15	
Power Dissipation		P_{out}	500		mW
Operating temperature range		T_{op}	–40 ~ 85		°C
Storage temperature range		T_{stg}	–40 ~ 125		°C
Total Power consumption		P(W)	550		mW
Isolation Voltage(2)		V_{ISO}	5000		Vrms
Soldering Temperature(3)		T_{SOL}	260		°C

Notes:
(1). A connection: 100ms (1 shot), VL = DC
(2)AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 3 are shorted together, and pins 4, 6 are shorted together.
(3).For 10 seconds

Electronic Optical Characteristics (TA = 25°C)

Parameter			Symbol	Min.	Typ.	Max.	Unit	Condition
Input	Forward Voltage		V_F	-	1.2	1.5	V	I_F=10mA
	Reverse Current		I_R	-	-	1	μA	V_R=5V
Output	Off State leakage Current		I_{leak}	-	-	1	μA	I_F=0mA, V_L=Max
	On Resistance	EL606A	$R_{d(ON)}$	-	0.7	2.5	Ω	I_F=10mA, I_L = Max. t = 1s
		EL640A		-	20	30		
		EL660A		-	40	70		
	Output Capacitance	EL606A	C_{out}	-	80	-	pF	VL = 0V, f = 1MHz
		EL640A		-	45	-		
		EL660A		-	30	-		
Transfer Characteristics	LED turn on Current		$IF_{(on)}$		2.5	5	mA	IL = Max.
	LED turn off current		$IF_{(off)}$	0.4	2.5	-	mA	IL = Max.
Turn On Time	EL606A		T_{ON}	-	1.4	3	ms	IF = 10 mA, IL = Max. RL = 200 Ω,
	EL640A			-	0.4	3		
	EL660A			-	1.4	3		
Turn Off Time	EL606A		T_{OFF}	-	0.05	0.5		
	EL640A			-	0.05	0.5		
	EL660A			-	0.05	0.5		

Turn on/Turn off Time



Characteristics Curves

Fig.1 LED Dropout Voltage vs. Ambient Temperature

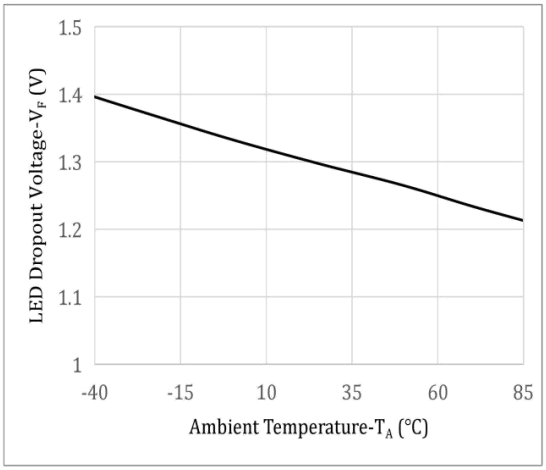


Fig.2 Output Current vs. Output Voltage

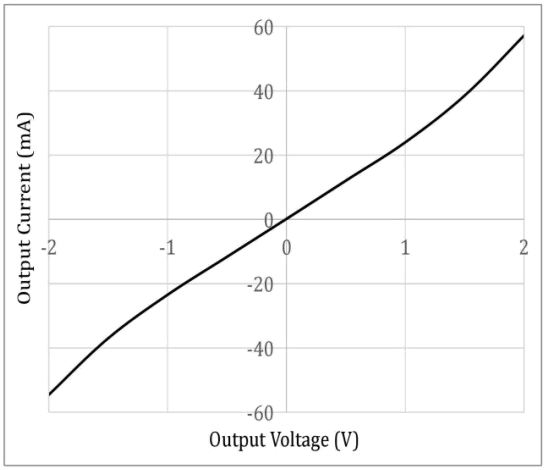


Fig.3 On Resistance vs. Ambient

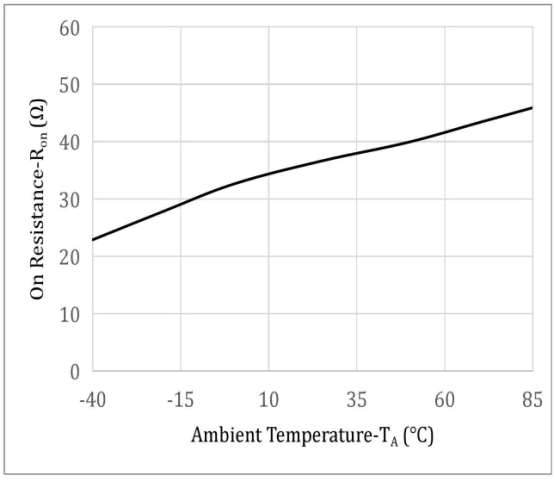


Fig.4 Load Current vs. Ambient Temperature

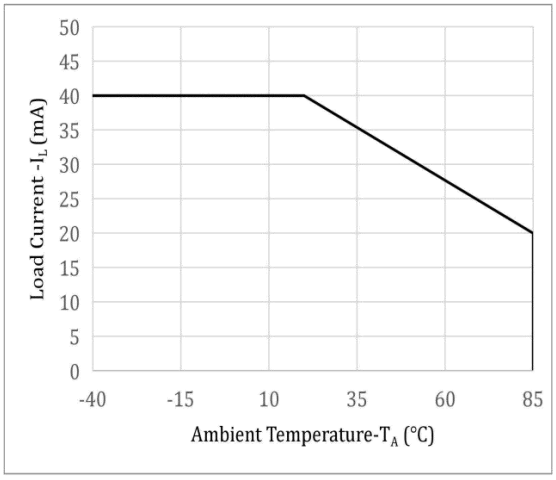


Fig.5 LED Operate Current vs. Ambient Temperature

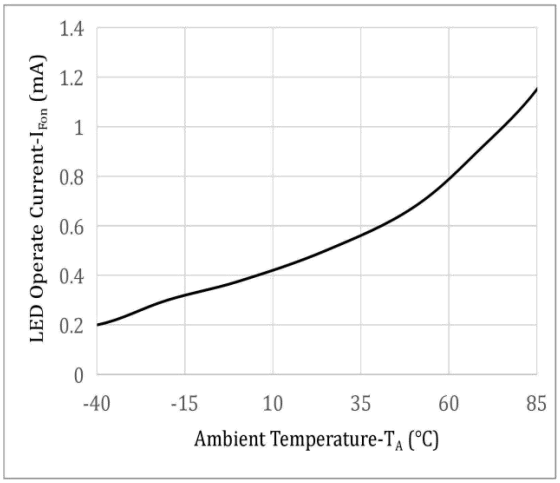


Fig.6 LED Turn Off Current vs. Ambient

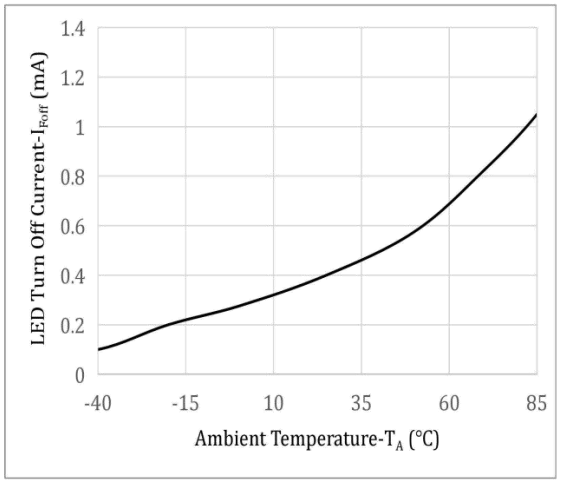


Fig.7 Turn On Time vs. Ambient Temperature

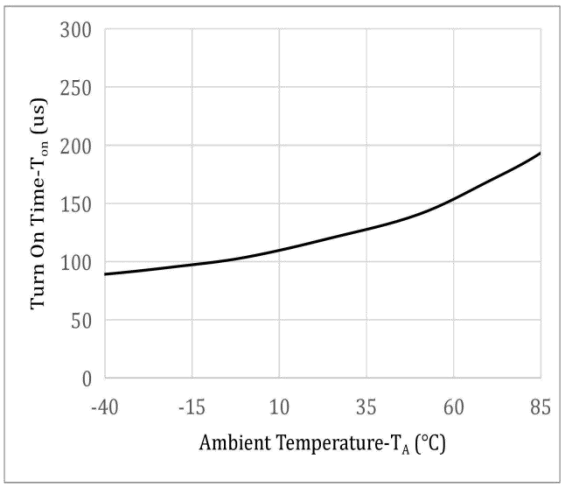


Fig.8 Turn Off Time vs. Ambient Temperature

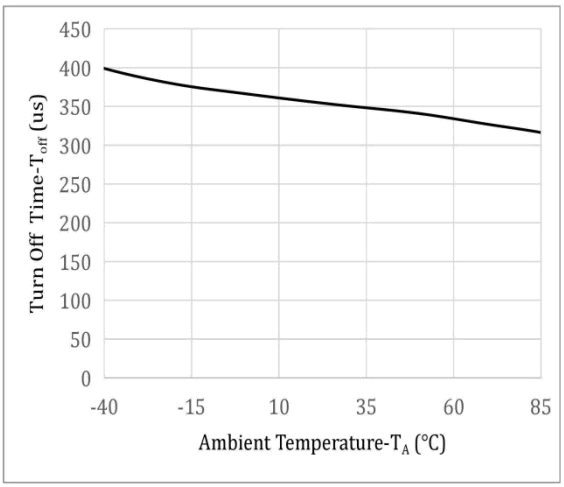


Fig.9 Turn On Time vs. LED Forward Current

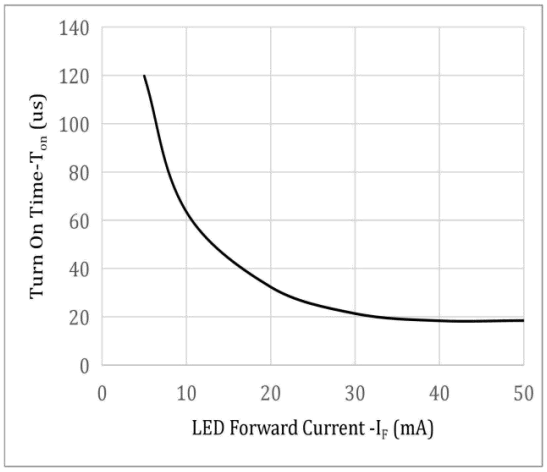


Fig.10 Turn Off Time vs. LED Forward

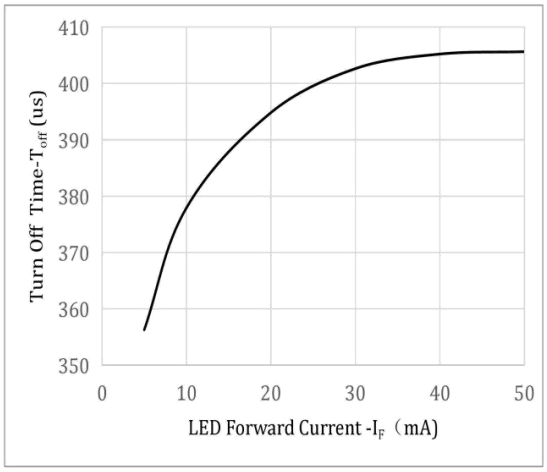
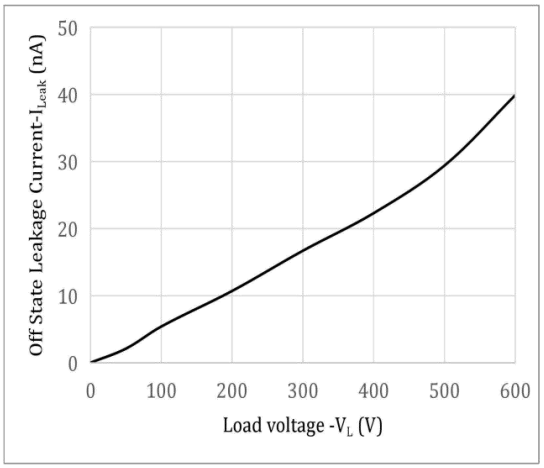
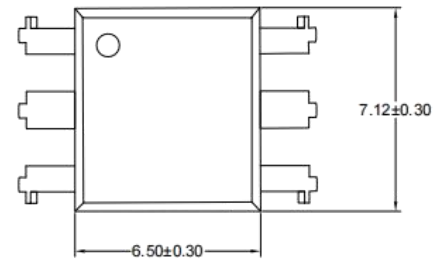


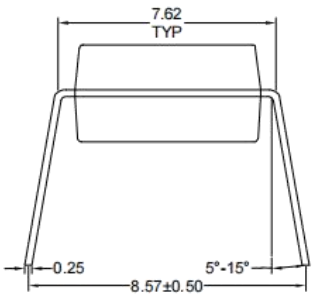
Fig.11 Off State Leakage Current vs Load Voltage

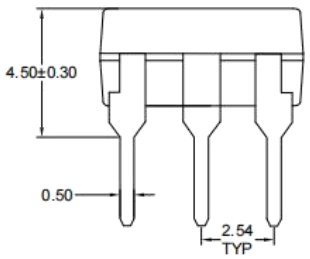


Outline Dimension

DIP-6 Type:

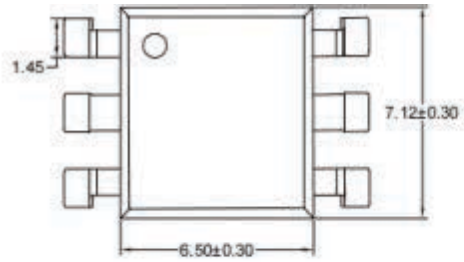


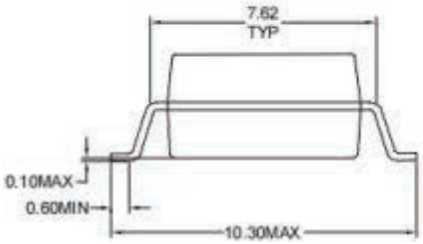


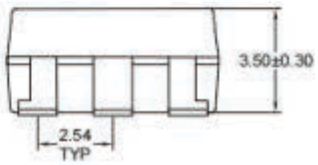


Outline Dimension

SMD-6 Type:

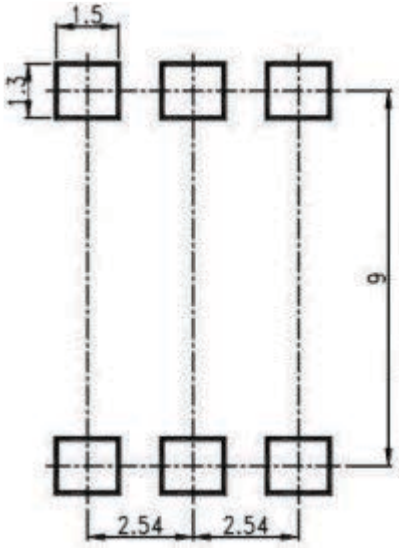






Unit: mm
Tolerance: ±0.1mm

Recommended solder pad Design



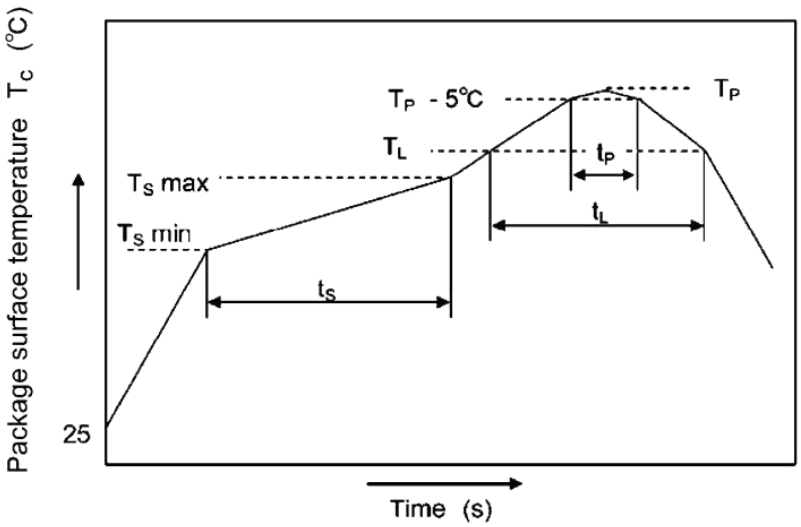
Unit: mm
Tolerance: ±0.1mm

Temperature Profile Of Soldering

1. IR Reflow soldering

(JEDEC-STD-020D compliant)

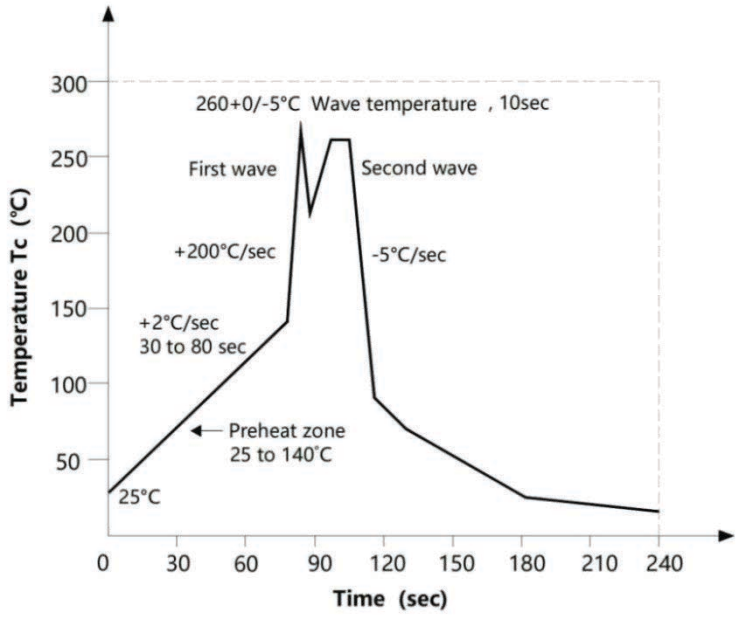
Profile item	Conditon
Preheat	
-Temperature Min (TSmin)	150°C
-Temperature Max (TSmax)	200°C
-Time (min to max) (ts)	90±30 sec
Soldering zone	
-Temperature (TL)	217°C
-Time (t_L)	60-150 sec
Peak Temperature (TP)	260°C
-Time (TP-5℃to TP) (ts)	30 sec
Ramp-up rate	3°C / sec max
Ramp-down rate	3~6°C/ sec



Notes:
One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

2. Wave soldering (JEDEC22A111 compliant)

One time soldering is recommended within the condition.
Temperature:260+0/-5˚C.
Time:10 sec.
Preheat temperature:25 to 140˚C.
Preheat time:30 to 80 sec.



3. Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.
Temperature: 380+0/-5˚C
Time: 3 sec max.

Attention

■ Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.

■ HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.

■ Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

■ HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could
give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

■ In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.

■ No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of HUA XUAN YANG ELECTRONICS CO.,LTD.

■ Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.