

## DUAL POLE OptoMOS® RELAYS

### LBA110/LBA110L



### DESCRIPTION

LBA110 is 350V, 120mA, 35Ω independent 1-Form-A and 1-Form-B relays. It is designed to provide an ideal solution where a complimentary Form-A/Form-B relay pair is required. Current limiting version is available ("L" suffix).

### FEATURES

- Small 8 Pin DIP Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- 3750V<sub>RMS</sub> Input/Output Isolation
- FCC Compatible
- VDE Compatible
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Current Limiting, Surface Mount and Tape & Reel Versions Available

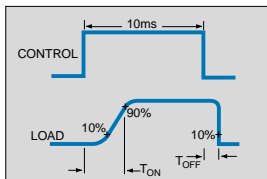
### APPROVALS

- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-10
- BSI Certified to:
  - BS EN 60950:1992 (BS7002:1992) Certificate #: 7344
  - BS EN 41003:1993 Certificate #: 7344

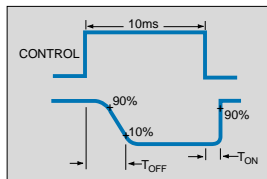
### OPTIONS / SUFFIXES

- P: Flatpack Package
- L: Current Limiting
- S: Surface Mount Package
- TR: Tape & Reel

Switching Characteristics of Normally Open (Form A) Devices



Switching Characteristics of Normally Closed (Form B) Devices



### APPLICATIONS

- Telecommunications
  - Telecom Switching
  - Tip/Ring Circuits
  - Modem Switching (Laptop, Notebook, Pocket Size)
  - Hookswitch
  - Dial Pulsing
  - Ground Start
  - Ringer Injection
- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
  - Meters (Watt-Hour, Water, Gas)
- Medical Equipment-Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

### RATINGS (@ 25° C)

Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150 <sup>1</sup>	mW
Input Control Current Peak (10ms)	-	-	50	mA
	-	-	1	A
Reverse Input Voltage	-	-	5	V
Total Power Dissipation	-	-	800 <sup>2</sup>	mW
Capacitance Input to Output	-	3	-	pF
Isolation Voltage Input to Output	3750	-	-	V <sub>RMS</sub>
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature DIP Package	-	-	+260	°C
Flatpack/Surface Mount Package (10 Seconds Max.)	-	-	+220	°C

<sup>1</sup> Derate Linearly 1.33 mw/°C  
<sup>2</sup> Derate Linearly 6.67 mw/°C

Note: For Mechanical Dimensions See Pages 408-415

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### LBA110/LBA110L

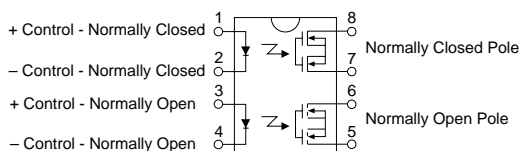
## SPECIFICATIONS

PARAMETER	CONDITIONS	SYMBOL	LBA110			LBA110L			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
<b>Output Characteristics @ 25°C</b>									
Load Voltage (Peak)	-	$V_L$	-	-	350	-	-	350	V
Load Current *(Continuous) AC/DC Configuration	-	$I_L$	-	-	120	-	-	120	mA
Peak Load Current	10ms	$I_{LPK}$	-	-	350	-	-	-	mA
On-Resistance AC/DC Configuration	$I_L=120mA$	$R_{ON}$	-	23	35	-	23	35	$\Omega$
Off-State Leakage Current	$V_L=350V$	$I_{LEAK}$	-	-	1	-	-	1	$\mu A$
Switching Speeds	$I_F=5mA, V_L=10V$ $I_F=5mA, V_L=10V$	$T_{ON}$ $T_{OFF}$	-	-	3	-	-	3	ms
Turn-On			-	-	3	-	-	3	ms
Turn-Off									
Output Capacitance	50V; f=1MHz	$C_{OUT}$	-	25	-	-	25	-	pF
Load Current Limiting	Form A only	$I_{CL}$	-	-	-	130	170	210	mA
<b>Input Characteristics @ 25°C</b>									
Input Control Current	$I_L=$ Load Current	$I_F$	5	-	50	5	-	50	mA
Input Dropout Current	-	$I_F$	0.4	0.7	-	0.4	0.7	-	mA
Input Voltage Drop	$I_F=5mA$	$V_F$	0.9	1.2	1.4	0.9	1.2	1.4	V
Reverse Input Voltage	-	$V_R$	-	-	5	-	-	5	V
Reverse Input Current	$V_R=5V$	$I_R$	-	-	10	-	-	10	$\mu A$
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	-	3	-	pF
Input to Output Isolation	-	$V_{I/O}$	3750	-	-	3750	-	-	$V_{RMS}$

\*NOTE: If both poles operate simultaneously load current must be derated so as not to exceed the package power dissipation value.

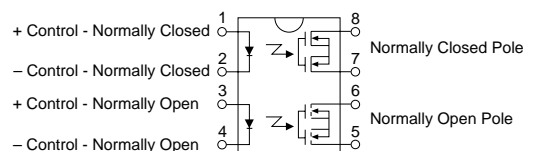
#### LBA110 Pinout

AC/DC Configuration



#### LBA110L Pinout

AC/DC Configuration



Note: For Mechanical Dimensions See Pages 408-415

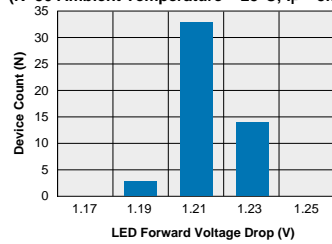
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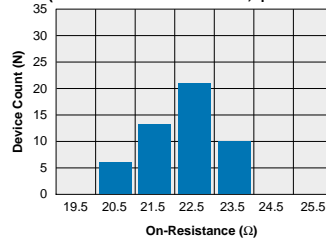
### LBA110/LBA110L

### PERFORMANCE DATA

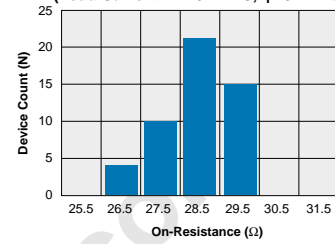
**LBA110**  
Typical LED Forward Voltage Drop  
(N=50 Ambient Temperature = 25°C; I<sub>F</sub> = 5mADC)



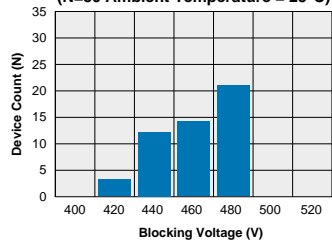
**LBA110 - FormA**  
Typical On-Resistance Distribution  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC, I<sub>F</sub>=5mADC)



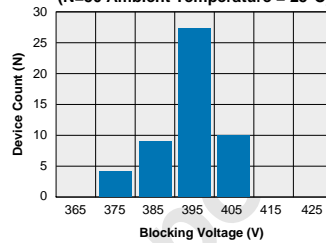
**LBA110 - FormB**  
Typical On-Resistance Distribution  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC, I<sub>F</sub>=5mADC)



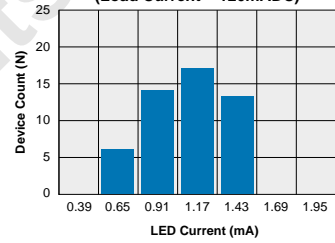
**LBA110 - FormA**  
Typical Blocking Voltage Distribution  
(N=50 Ambient Temperature = 25°C)



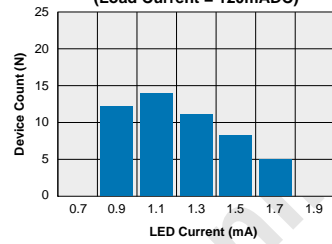
**LBA110 - FormB**  
Typical Blocking Voltage Distribution  
(N=50 Ambient Temperature = 25°C)



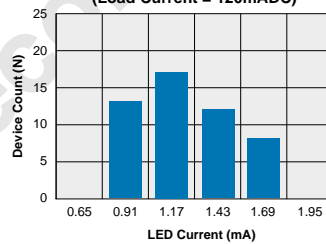
**LBA110 - FormA**  
Typical I<sub>F</sub> for Switch Dropout  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC)



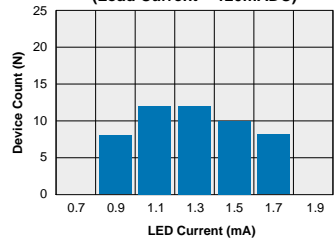
**LBA110 - FormB**  
Typical I<sub>F</sub> for Switch Dropout  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC)



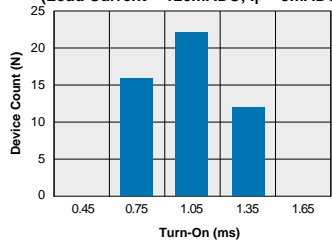
**LBA110 - FormA**  
Typical I<sub>F</sub> for Switch Operation  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC)



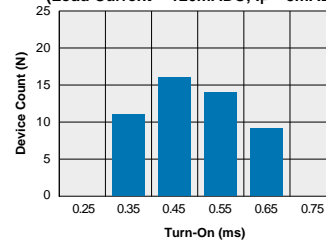
**LBA110 - FormB**  
Typical I<sub>F</sub> for Switch Operation  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC)



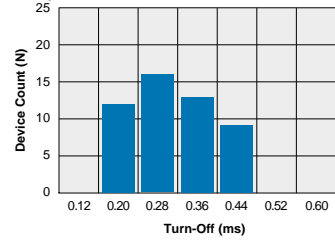
**LBA110 - FormA**  
Typical Turn-On Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC; I<sub>F</sub> = 5mADC)



**LBA110 - FormB**  
Typical Turn-On Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC; I<sub>F</sub> = 5mADC)



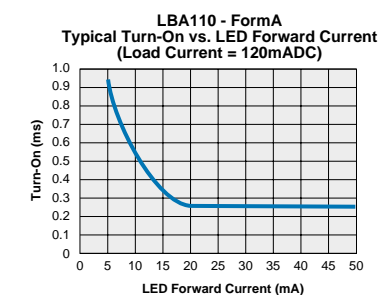
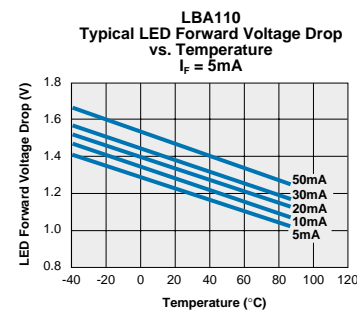
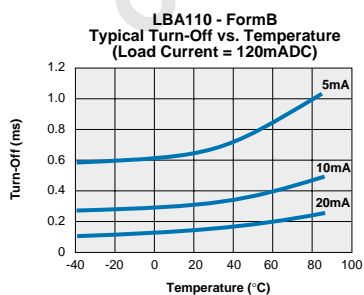
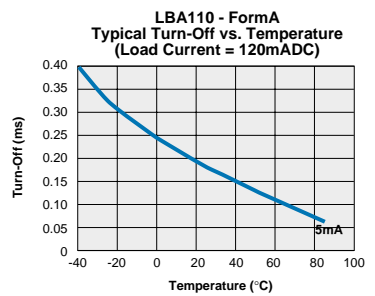
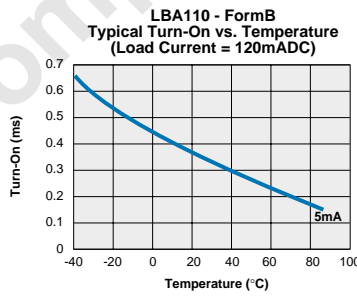
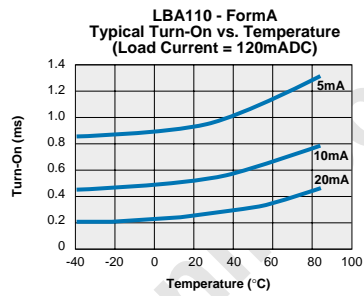
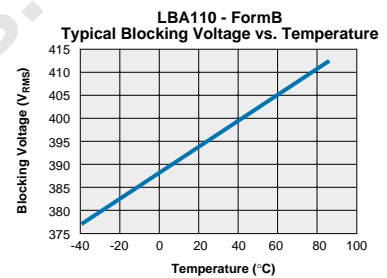
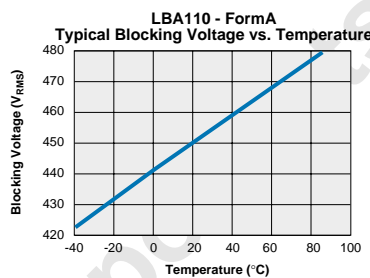
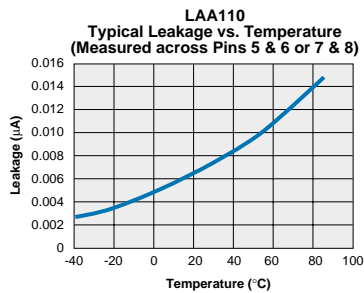
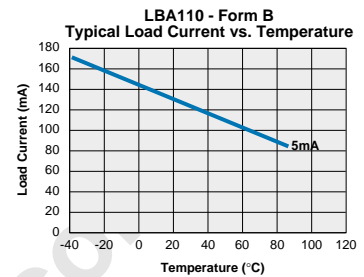
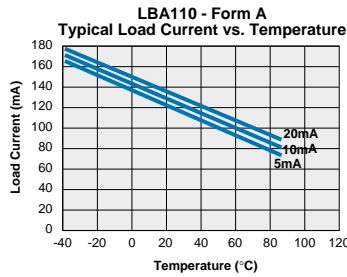
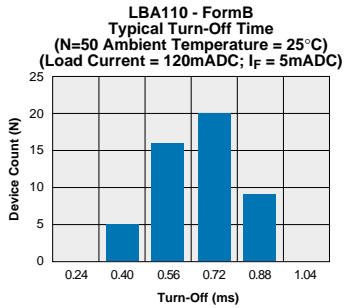
**LBA110 - FormA**  
Typical Turn-Off Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC; I<sub>F</sub> = 5mADC)



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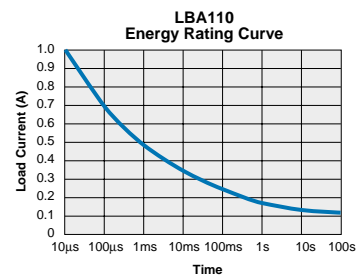
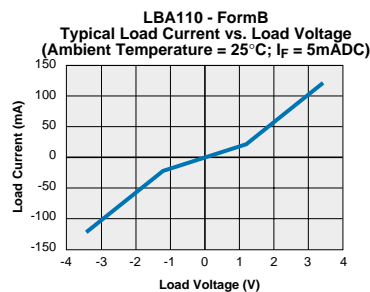
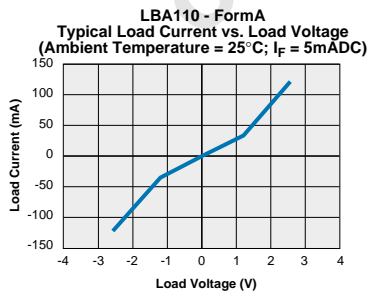
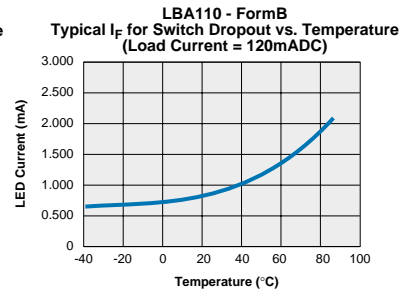
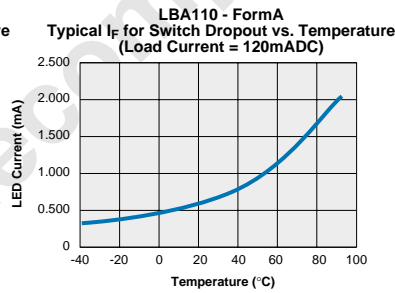
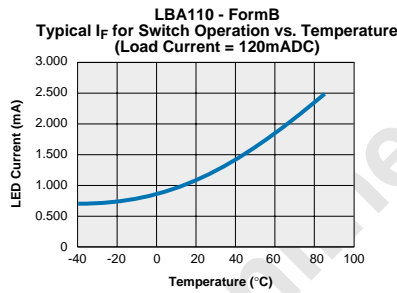
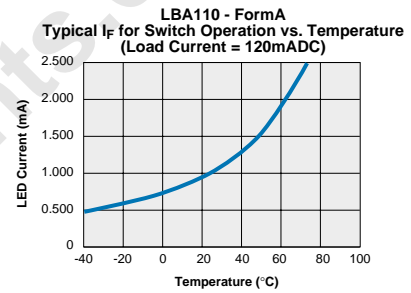
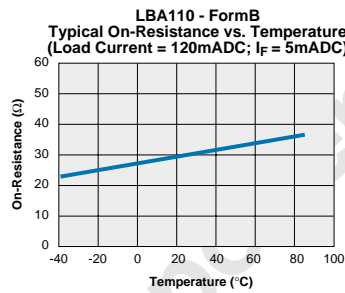
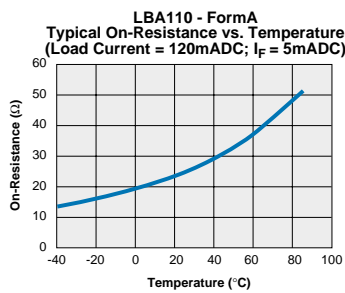
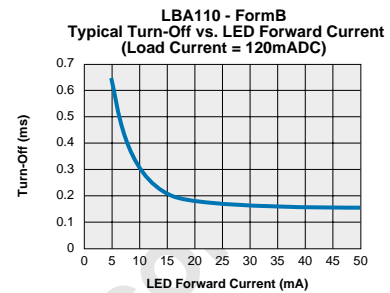
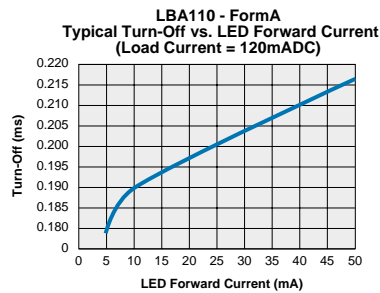
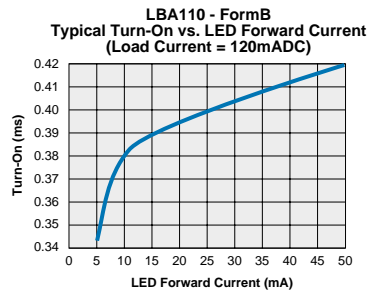
#### PERFORMANCE DATA



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### LBA110/LBA110L

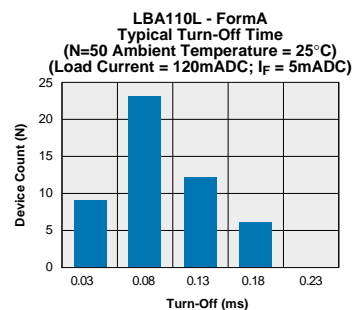
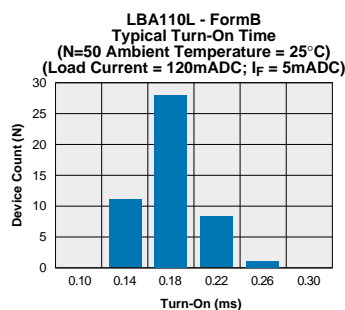
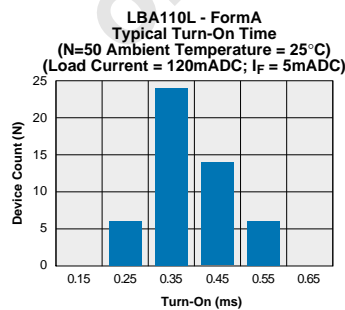
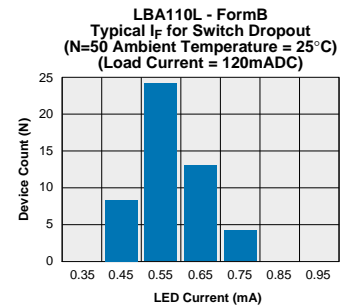
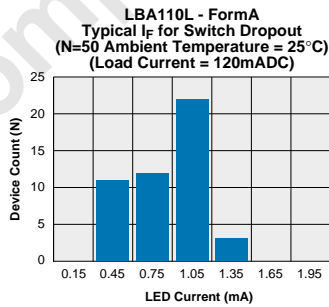
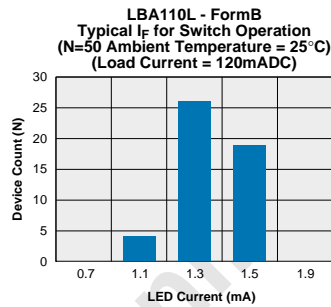
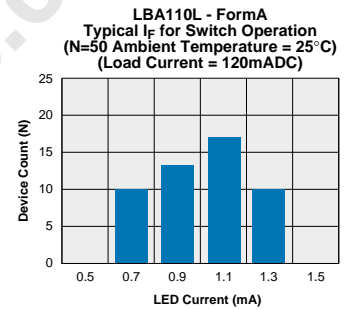
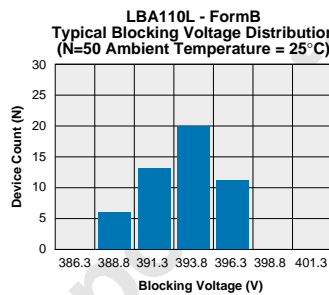
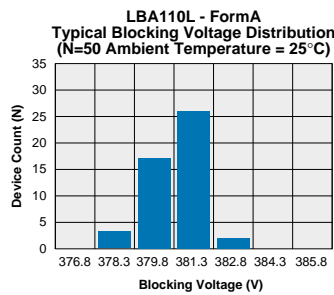
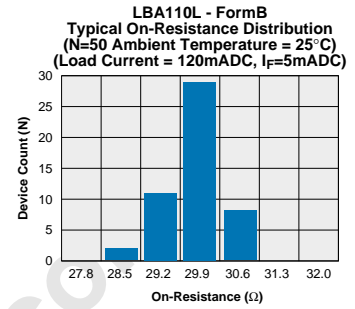
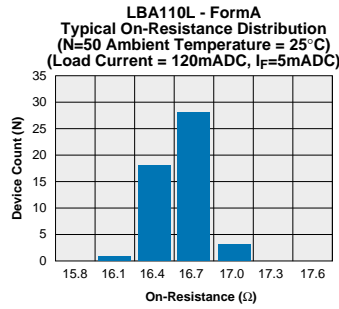
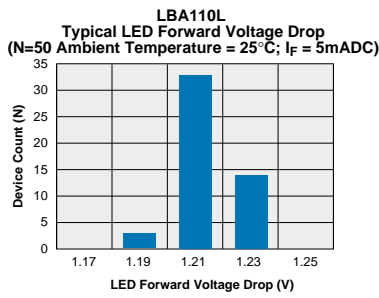
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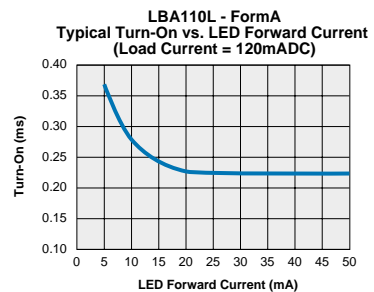
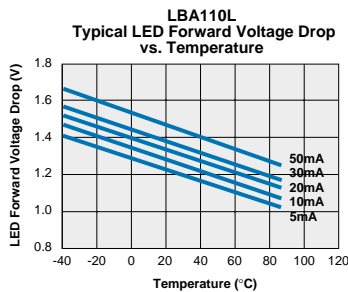
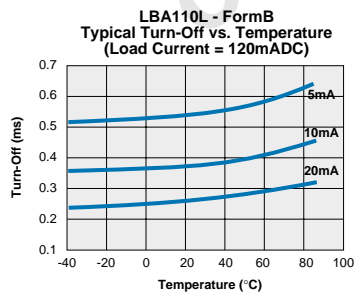
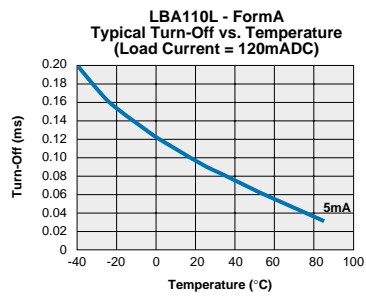
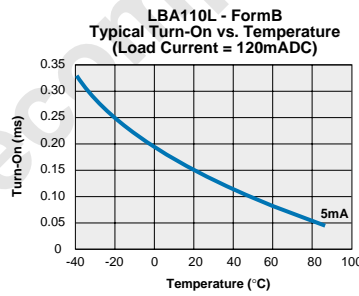
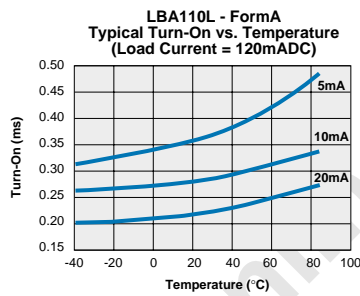
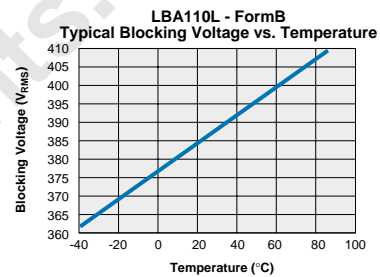
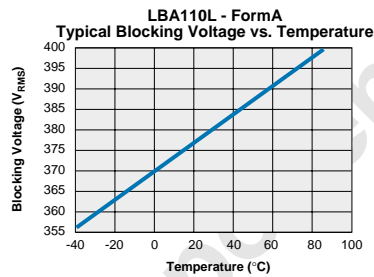
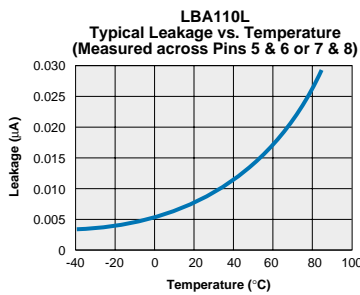
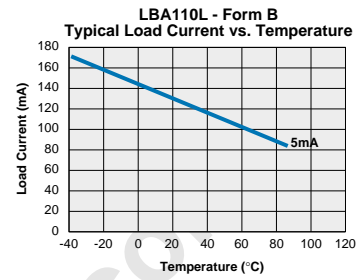
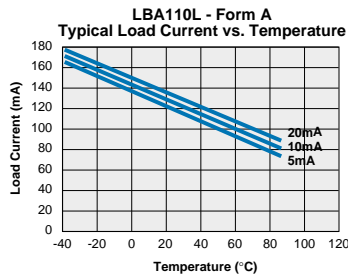
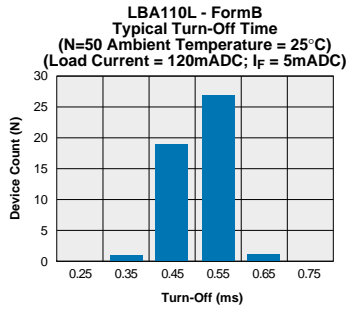
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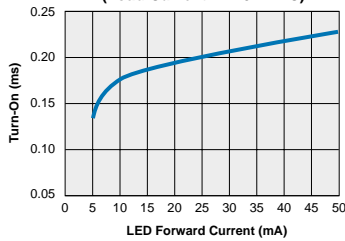


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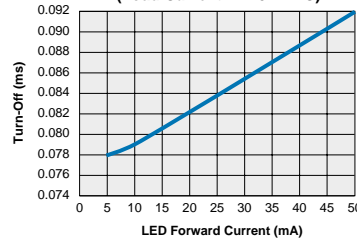
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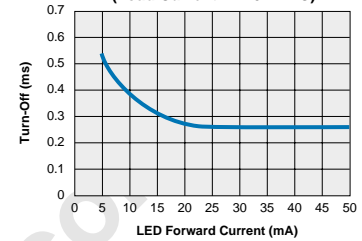
**LBA110L - FormB**  
Typical Turn-On vs. LED Forward Current  
(Load Current = 120mADC)



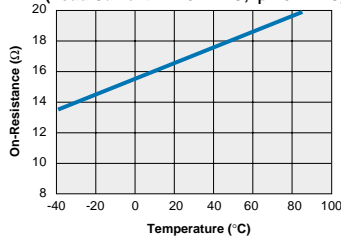
**LBA110L - FormA**  
Typical Turn-Off vs. LED Forward Current  
(Load Current = 120mADC)



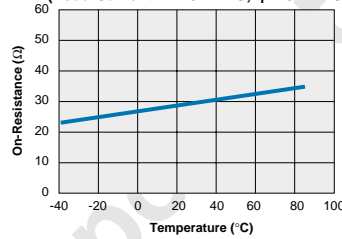
**LBA110L - FormB**  
Typical Turn-Off vs. LED Forward Current  
(Load Current = 120mADC)



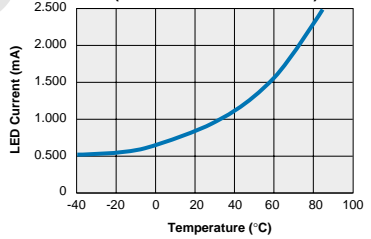
**LBA110L - FormA**  
Typical On-Resistance vs. Temperature  
(Load Current = 120mADC; I<sub>F</sub> = 5mADC)



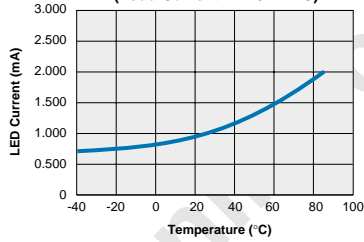
**LBA110L - FormB**  
Typical On-Resistance vs. Temperature  
(Load Current = 120mADC; I<sub>F</sub> = 5mADC)



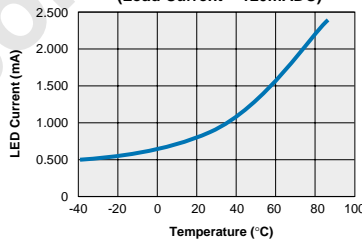
**LBA110L - FormA**  
Typical I<sub>F</sub> for Switch Operation vs. Temperature  
(Load Current = 120mADC)



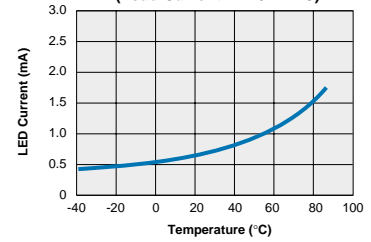
**LBA110L - FormB**  
Typical I<sub>F</sub> for Switch Operation vs. Temperature  
(Load Current = 120mADC)



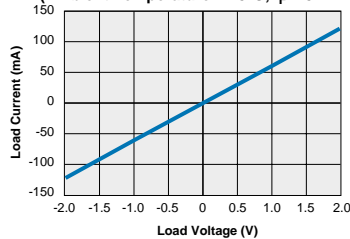
**LBA110L - FormA**  
Typical I<sub>F</sub> for Switch Dropout vs. Temperature  
(Load Current = 120mADC)



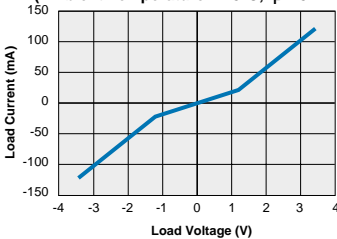
**LBA110L - FormB**  
Typical I<sub>F</sub> for Switch Dropout vs. Temperature  
(Load Current = 120mADC)



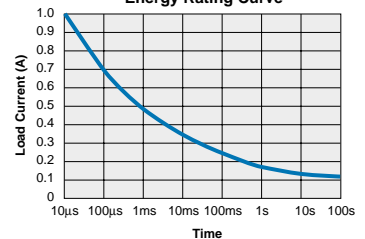
**LBA110L - FormA**  
Typical Load Current vs. Load Voltage  
(Ambient Temperature = 25°C; I<sub>F</sub> = 5mADC)



**LBA110L - FormB**  
Typical Load Current vs. Load Voltage  
(Ambient Temperature = 25°C; I<sub>F</sub> = 5mADC)



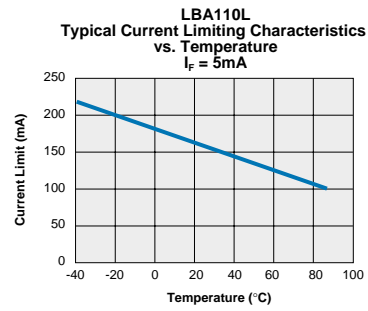
**LBA110L**  
Energy Rating Curve



## DUAL POLE OptoMOS® RELAYS

### LBA110/LBA110L

#### PERFORMANCE DATA



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