Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

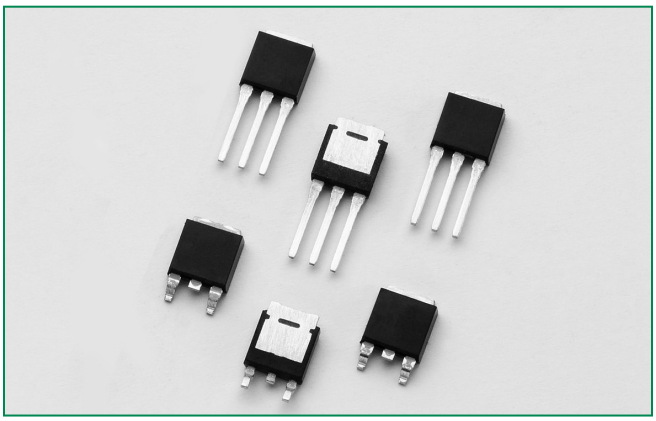
We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

LJxx06xx & QJxx06xHx series

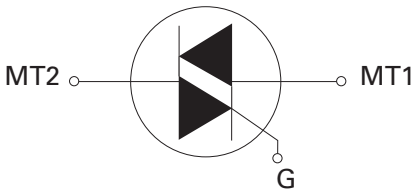
HF RoHS



Main Features

Symbol	Value	Unit
$I_{T(RMS)}$	6	A
V_{DRM}/V_{RRM}	400 or 600	V
$I_{GT\ (Q1)}$	10 to 35	mA

Schematic Symbol



PRELIMINARY & CONFIDENTIAL

Littelfuse, Inc. has characterized initial samples of this device and is currently conducting reliability testing. Parts numbers and specifications are subject to change until the datasheet is made final.

Description

This 6 A High Temperature Alternistor Triac solid state switch series is designed for AC switching and phase control applications such as motor speed and temperature modulation controls, lighting controls, and static switching relays.

Sensitive type components guarantee gate control in Quadrants I & IV needed for digital control circuitry.

Alternistor type components only operate in quadrants I, II, & III and are used in circuits requiring high dv/dt capability.

Features & Benefits

- ~~RoHS compliant~~
- 150°C maximum junction temperature
- Voltage capability up to 600V
- Surge capability up to 72A at 60Hz half cycle
- Solid-state switching eliminates arcing or contact bounce that create voltage transients
- No contacts to wear out from reaction of switching events
- Restricted (or limited) RFI generation, depending on activation point of sine wave
- Requires only a small gate activation pulse in each half-cycle
- Halogen free and RoHS compliant

Applications

Excellent for AC switching and phase control applications such as heating, lighting, and motor speed controls.

Typical applications are AC solid-state switches, light dimmers, power tools, home/brown goods and white goods appliances.

Alternistor Triacs (no snubber required) are used in applications with high inductive loads requiring the highest commutation performance.

Internally constructed isolated packages are offered for ease of heat sinking with highest isolation voltage.

Absolute Maximum Ratings — Sensitive Triac (4 Quadrants)

Symbol	Parameter			Value	Unit
V_{DSM}/V_{RSM}	Peak non-repetitive blocking voltage	Pw=100 µs		700	V
$I_{T(RMS)}$	RMS on-state current (full sine wave)	LJxx06Vy/LJxx06Dy	T_C = 125°C	6	A
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_J initial = 25°C)	f = 50 Hz	t = 20 ms	60	A
		f = 60 Hz	t = 16.7 ms	72	
I^2t	I^2t Value for fusing	t_p = 8.3 ms		21.5	A^2s
di/dt	Critical rate of rise of on-state current I_G = 50mA with 0.1µs rise time	f = 60 Hz	T_J = 150°C	70	A/µs
I_{GTM}	Peak gate trigger current	$t_p \leq 10$ µs	T_J = 150°C	1.6	A
$P_{G(AV)}$	Average gate power dissipation		T_J = 150°C	0.4	W
T_{stg}	Storage temperature range			-40 to 150	°C
T_J	Operating junction temperature range			-40 to 150	°C

Note: xx=voltage/10, y = sensitivity

Revised: 04/23/18

Absolute Maximum Ratings — Alternistor Triac (3 Quadrants)

Symbol	Parameter			Value	Unit
V_{DSM}/V_{RSM}	Peak non-repetitive blocking voltage	Pw=100 µs		700	V
$I_{T(RMS)}$	RMS on-state current (full sine wave)	QJxx06VHy/QJxx06DHy	T_C = 130°C	6	A
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_J initial = 25°C)	f = 50 Hz, t = 20 ms	QJxx06VHy QJxx06DHy	60	A
		f = 60 Hz, t = 16.7 ms	QJxx06VHy QJxx06DHy	72	
I^2t	I^2t Value for fusing	t_p = 8.3 ms	QJxx06VHy QJxx06DHy	21.5	A^2s
di/dt	Critical rate of rise of on-state current	f = 60 Hz	T_J = 150°C	70	A/µs
I_{GTM}	Peak gate trigger current	$t_p \le 10$ µs; $I_{GT} \le I_{GTM}$	T_J = 150°C	1.2	A
$P_{G(AV)}$	Average gate power dissipation		T_J = 150°C	0.3	W
T_{stg}	Storage temperature range			-40 to 150	°C
T_J	Operating junction temperature range			-40 to 150	°C

Note: xx=voltage/10, y = sensitivity

Electrical Characteristics (T_J = 25°C, unless otherwise specified) — Sensitive Triac (4 Quadrants)

Symbol	Test Conditions	Quadrant		Value LJxx06x8	Unit
I_{GT}	V_D = 12V R_L = 60 Ω	I – II – III IV	MAX.	10 20	mA
V_{GT}		ALL	MAX.	1.2	V
V_{GD}	$V_D = V_{DRM}$ R_L = 3.3 kΩ T_J = 150°C	ALL	MIN.	0.15	V
I_H	I_T = 100mA		MAX.	25	mA
dv/dt	$V_D = V_{DRM}$ Gate Open T_J = 150°C	400V 600V	TYP.	80 50	V/µs
(dv/dt)c	(di/dt)c = 3.2 A/ms T_J = 150°C		TYP.	2	V/µs
t_{gt}	$I_G = 2 \times I_{GT}$ PW = 15µs I_T = 8.5 A(pk)		TYP.	12	µs

Note: xx=voltage/10, x = package

Electrical Characteristics (T_J = 25°C, unless otherwise specified) — Alternistor Triac (3 Quadrants)

Symbol	Test Conditions	Quadrant			Value QJxx06xH3	Value QJxx06xH4	Unit
I_{GT}	V_D = 12V R_L = 60 Ω	I – II – III	MAX.		10	35	mA
V_{GT}		I – II – III	MAX.		1.3		V
V_{GD}	$V_D = V_{DRM}$ R_L = 3.3 kΩ T_J = 150°C	I – II – III	MIN.		0.15		V
I_H	I_T = 100mA		MAX.		25	35	mA
dv/dt	$V_D = V_{DRM}$ Gate Open T_J = 150°C	QJxx06VHY/ QJxx06DHy	MIN.	400V	150	350	V/µs
				600V	100	250	
(dv/dt)c	(di/dt)c = 3.2 A/ms T_J = 150°C		MIN.		15	20	V/µs
t_{gt}	$I_G = 2 \times I_{GT}$ PW = 15µs I_T = 8.5 A(pk)		TYP.		10	10	µs

Note: xx=voltage/10, x = package

Revised: 04/23/18

Static Characteristics

Symbol	Test Conditions					Value	Unit
V_{TM}	I_{TM} = 8.4 A t_p = 380 µs				MAX.	1.40	V
I_{DRM} / I_{RRM}	V_{DRM} = V_{RRM}	LJxx06xy	T_J = 25°C	400 - 600V	MAX.	10	µA
			T_J = 125°C	400 - 600V		0.5	mA
			T_J = 150°C	400 - 600V		3	
		QJxx06xHy	T_J = 25°C	400 - 600V		10	µA
			T_J = 125°C	400 - 600V		0.5	mA
			T_J = 150°C	400 - 600V		3	

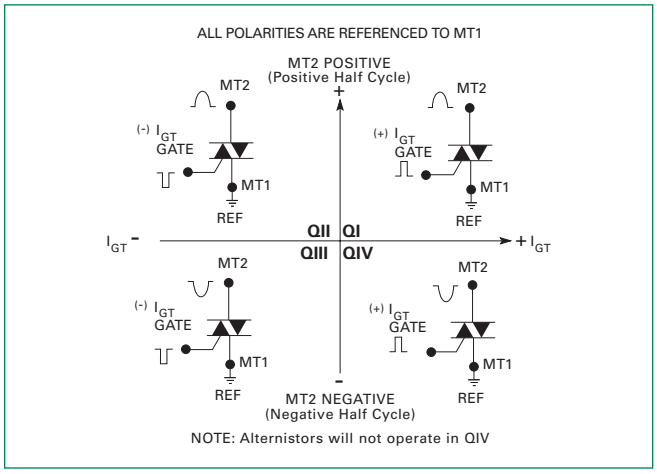
Note: xx=voltage/10, x = package, y = sensitivity

Thermal Resistances

Symbol	Parameter		Value	Unit
$R_{\theta(JC)}$	Junction to case (AC)	LJ/QJxx06Vyy LJ/QJxx06Dyy	1.3	°C/W
$R_{\theta(J-A)}$	Junction to ambient	LJ/QJxx06Vyy LJ/QJxx06Dyy	70	°C/W

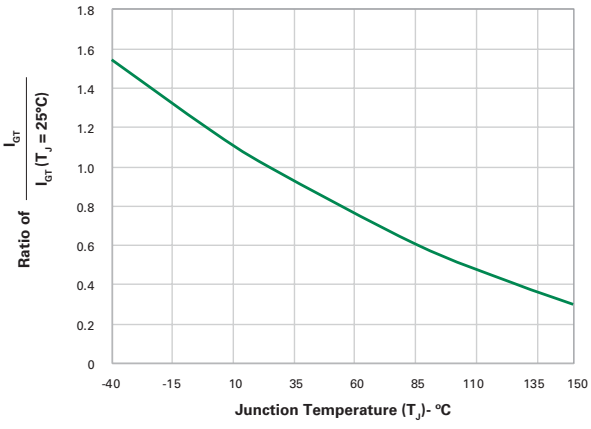
Note: xx=voltage/10, y = sensitivity

Figure 1: Definition of Quadrants



Note: Alternistors will not operate in QIV

Figure 2: Normalized DC Gate Trigger Current for All Quadrants vs. Junction Temperature



PRELIMINARY & CONFIDENTIAL

Littelfuse, Inc. has characterized initial samples of this device and is currently conducting reliability testing. Parts numbers and specifications are subject to change until the datasheet is made final.

Revised: 04/23/18

Figure 3: Normalized DC Holding Current vs. Junction Temperature

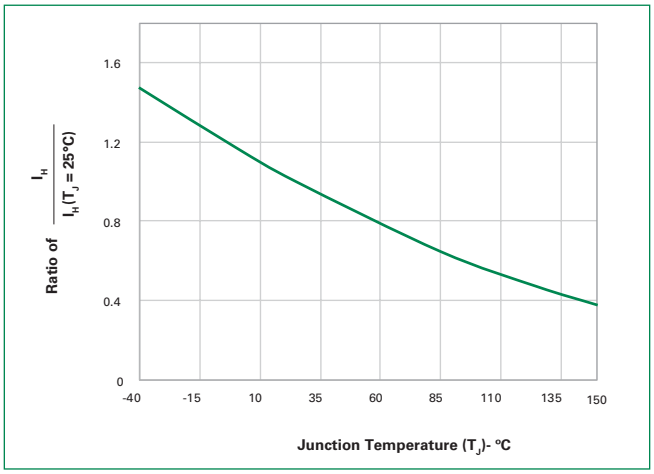


Figure 4: Normalized DC Gate Trigger Voltage for All Quadrants vs. Junction Temperature

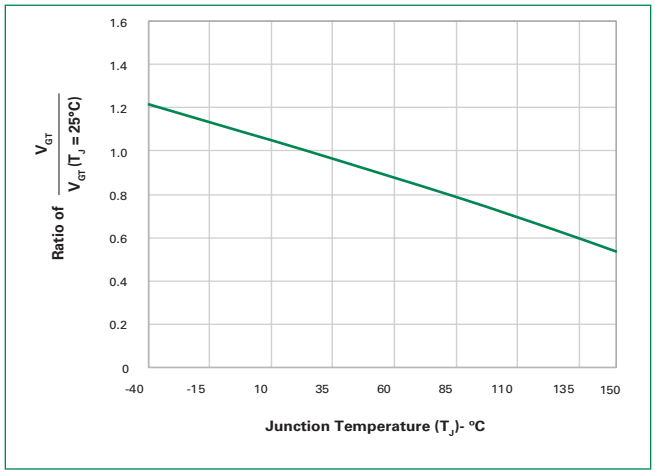


Figure 5: Power Dissipation (Typical) vs. RMS On-State Current

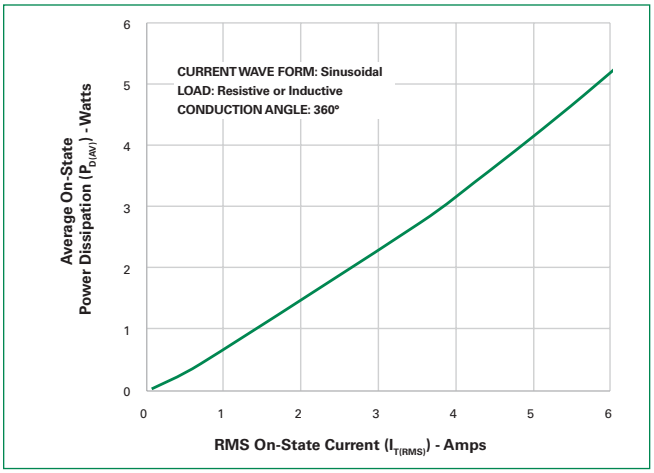


Figure 6: Maximum Allowable Case Temperature vs. On-State Current

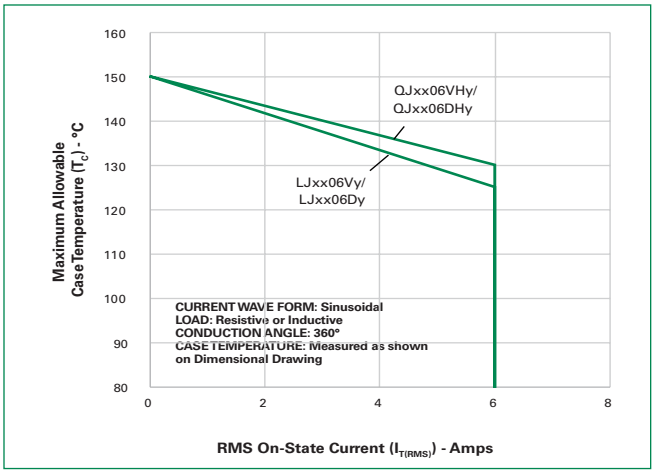
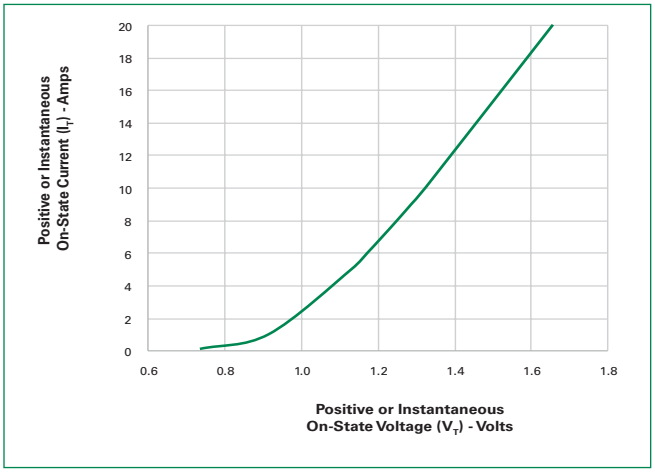


Figure 7: On-State Current vs. On-State Voltage (Typical)

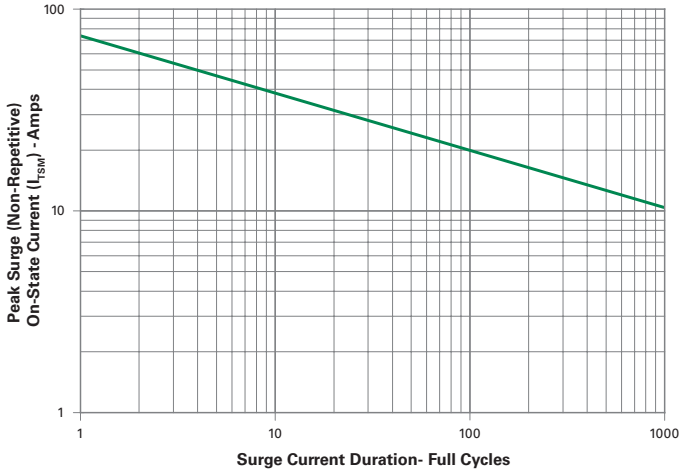


PRELIMINARY & CONFIDENTIAL

Littelfuse, Inc. has characterized initial samples of this device and is currently conducting reliability testing. Parts numbers and specifications are subject to change until the datasheet is made final.

Revised: 04/23/18

Figure 8: Surge Peak On-State Current vs. Number of Cycles

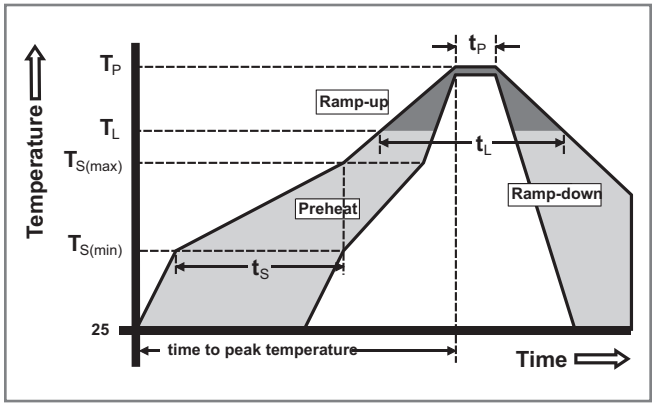


SUPPLY FREQUENCY: 60 Hz Sinusoidal
LOAD: Resistive
RMS On-State Current: [$I_{T(RMS)}$]: Maximum Rated Value at Specified Case Temperature

Notes:
1. Gate control may be lost during and immediately following surge current interval.
2. Overload may not be repeated until junction temperature has returned to steady-state rated value.

Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	-Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp) (T_L) to peak		5°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		5°C/second max
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Time (t_L)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		280°C



PRELIMINARY & CONFIDENTIAL

Littelfuse, Inc. has characterized initial samples of this device and is currently conducting reliability testing. Parts numbers and specifications are subject to change until the datasheet is made final.

Revised: 04/23/18

Thyristors

6 Amp High Temp Sensitive & Alternistor (High Commutation) Triacs

Physical Specifications

Terminal Finish	100% Matte Tin-plated
Body Material	UL recognized compound meeting flammability rating V-0.
Terminal Material	Copper Alloy

Environmental Specifications

Test	Specifications and Conditions
AC Blocking (V_{DRM})	MIL-STD-750, M-1040, Cond A Applied Peak AC voltage @ 150°C for 1008 hours
Temperature Cycling	MIL-STD-750, M-1051, 100 cycles; -55°C to +150°C; 15-min dwell-time
Temperature/ Humidity	EIA / JEDEC, JESD22-A101 1008 hours; 160V - DC: 85°C; 85% rel humidity
High Temp Storage	MIL-STD-750, M-1031, 1008 hours; 150°C
Low-Temp Storage	1008 hours; -40°C
Resistance to Solder Heat	MIL-STD-750 Method 2031
Solderability	ANSI/J-STD-002, category 3, Test A
Lead Bend	MIL-STD-750, M-2036 Cond E

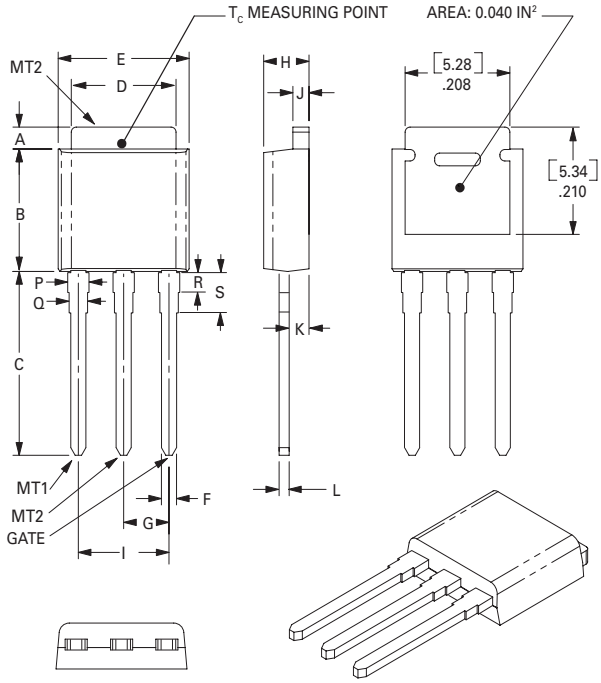
Design Considerations

Careful selection of the correct component for the application's operating parameters and environment will go a long way toward extending the operating life of the Thyristor. Good design practice should limit the maximum continuous current through the main terminals to 75% of the component rating. Other ways to ensure long life for a power discrete semiconductor are proper heat sinking and selection of voltage ratings for worst case conditions. Overheating, overvoltage (including dv/dt), and surge currents are the main killers of semiconductors. Correct mounting, soldering, and forming of the leads also help protect against component damage.

PRELIMINARY & CONFIDENTIAL

Littelfuse, Inc. has characterized initial samples of this device and is currently conducting reliability testing. Parts numbers and specifications are subject to change until the datasheet is made final.

Dimensions — TO-251AA (V-Package) — V-PAK Through Hole



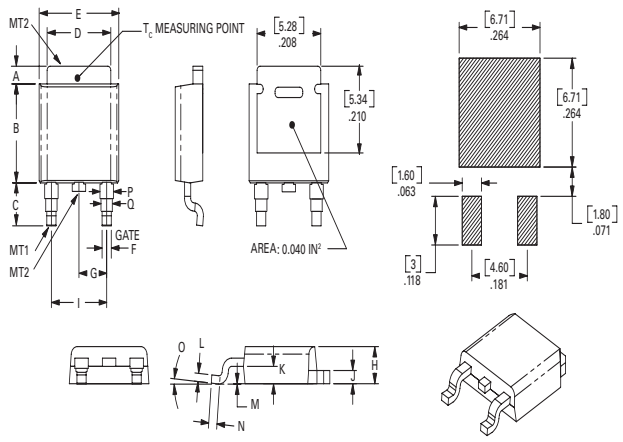
Dimension	Inches			Millimeters		
	Min	Typ	Max	Min	Typ	Max
A	0.037	0.040	0.043	0.94	1.01	1.09
B	0.235	0.242	0.245	5.97	6.15	6.22
C	0.350	0.361	0.375	8.89	9.18	9.53
D	0.205	0.208	0.213	5.21	5.29	5.41
E	0.255	0.262	0.265	6.48	6.66	6.73
F	0.027	0.031	0.033	0.69	0.80	0.84
G	0.087	0.090	0.093	2.21	2.28	2.36
H	0.085	0.092	0.095	2.16	2.34	2.41
I	0.176	0.180	0.184	4.47	4.57	4.67
J	0.018	0.020	0.023	0.46	0.51	0.58
K	0.035	0.037	0.039	0.90	0.95	1.00
L	0.018	0.020	0.023	0.46	0.52	0.58
P	0.042	0.047	0.052	1.06	1.20	1.32
Q	0.034	0.039	0.044	0.86	1.00	1.11
R	0.034	0.039	0.044	0.86	1.00	1.11
S	0.074	0.079	0.084	1.86	2.00	2.11

Revised: 04/23/18

Thyristors

6 Amp High Temp Sensitive & Alternistor (High Commutation) Triacs

Dimensions — TO-252AA (D-Package) — D-PAK Surface mount



Dimension	Inches			Millimeters		
	Min	Typ	Max	Min	Typ	Max
A	0.037	0.040	0.043	0.94	1.01	1.09
B	0.235	0.243	0.245	5.97	6.16	6.22
C	0.106	0.108	0.113	2.69	2.74	2.87
D	0.205	0.208	0.213	5.21	5.29	5.41
E	0.255	0.262	0.265	6.48	6.65	6.73
F	0.027	0.031	0.033	0.69	0.80	0.84
G	0.087	0.090	0.093	2.21	2.28	2.36
H	0.085	0.092	0.095	2.16	2.33	2.41
I	0.176	0.179	0.184	4.47	4.55	4.67
J	0.018	0.020	0.023	0.46	0.51	0.58
K	0.035	0.037	0.039	0.90	0.95	1.00
L	0.018	0.020	0.023	0.46	0.51	0.58
M	0.000	0.000	0.004	0.00	0.00	0.10
N	0.021	0.026	0.027	0.53	0.67	0.69
O	0°	0°	5°	0°	0°	5°
P	0.042	0.047	0.052	1.06	1.20	1.32
Q	0.034	0.039	0.044	0.86	1.00	1.11

PRELIMINARY & CONFIDENTIAL

Littelfuse, Inc. has characterized initial samples of this device and is currently conducting reliability testing. Parts numbers and specifications are subject to change until the datasheet is made final.

Product Selector

Part Number	Voltage		Gate Sensitivity Quadrants		Type	Package
	400V	600V	I - II - III	IV		
LJxx06D8	x	x	10	20	Sensitive Triac	TO-252 D-PAK
LJxx06V8	x	x	10	20	Sensitive Triac	TO-251 V-PAK
QJxx06DH3	x	x	10		Alternistor Triac	TO-252 D-PAK
QJxx06VH3	x	x	10		Alternistor Triac	TO-251 V-PAK
QJxx06DH4	x	x	35		Alternistor Triac	TO-252 D-PAK
QJxx06VH4	x	x	35		Alternistor Triac	TO-251 V-PAK

Note: xx = voltage/10

Packing Options

Part Number	Marking	Weight	Packing Mode	Base Quantity
LJxx06D8TP	LJxx06D8	0.3g	Tube Pack	750(75 per tube)
LJxx06D8RP	LJxx06D8	0.3g	Embossed Carrier	2500
LJxx06V8TP	LJxx06V8	0.4g	Tube Pack	750(75 per tube)
QJxx06DH3TP	QJxx06DH3	0.3g	Tube Pack	750(75 per tube)
QJxx06DH3RP	QJxx06DH3	0.3g	Embossed Carrier	2500
QJxx06VH3TP	QJxx06VH3	0.4g	Tube Pack	750(75 per tube)
QJxx06DH4TP	QJxx06DH4	0.3g	Tube Pack	750(75 per tube)
QJxx06DH4RP	QJxx06DH4	0.3g	Embossed Carrier	2500
QJxx06VH4TP	QJxx06VH4	0.4g	Tube Pack	750(75 per tube)

Note: xx = voltage/10

Revised: 04/23/18

Part Numbering System

QJ 60 06 V 8

COMPONENT TYPE
LJ : HT Sensitive Triac
QJ : HT Triac or Alternistor

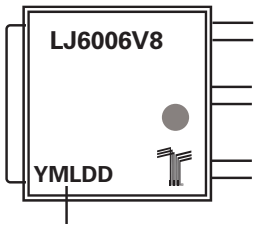
VOLTAGE RATING
40 : 400V
60 : 600V

CURRENT
06: 6A

PACKAGE TYPE
V : TO-251 (VPAK)
D : TO-252 (DPAK)

SENSIT IVITY & TYPE
Sensitive Triac:
8 : 10 mA (QI, II, III)
20 mA (QIV)
Alternistor Triac:
H3 : 10 mA (QI, II, III)
H4 : 35 mA (QI, II, III)

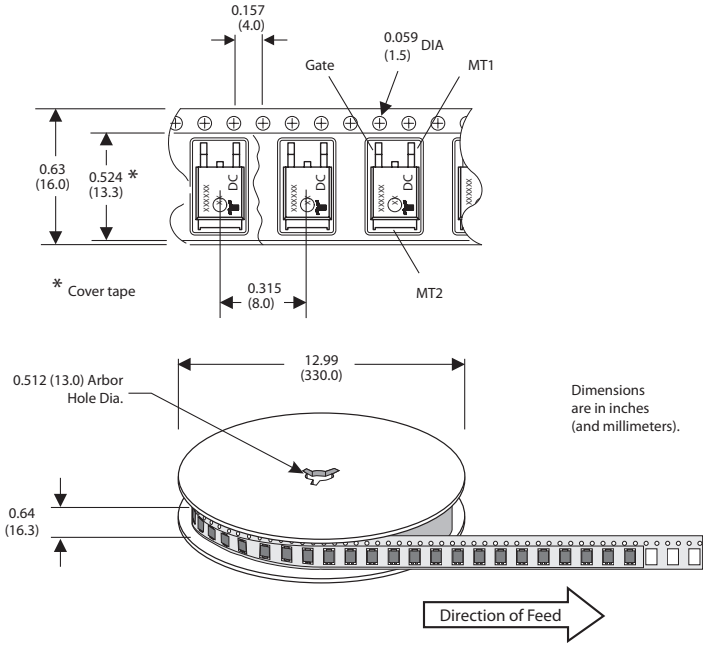
Part Marking System



Date Code Marking
Y:Year Code
M: Month Code
L: Location Code
DD: Calendar Code

TO-252 Embossed Carrier Reel Pack (RP) Specifications

Meets all EIA-481-2 Standards



PRELIMINARY & CONFIDENTIAL

Littelfuse, Inc. has characterized initial samples of this device and is currently conducting reliability testing. Parts numbers and specifications are subject to change until the datasheet is made final.

Revised: 04/23/18