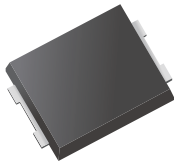
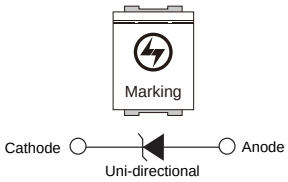
LTVxxA(C)Q Series

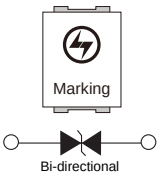
Transient Voltage Suppressors (TVS) Data Sheet

Features



- 3000W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycle): 0.01%
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- Typical I_R less than 2μA above 10V
- For surface mounted applications in order to optimize board space
- Low inductance
- Fast response time
- Low profile package
- Glass passivated junction
- Excellent clamping capability
- Built-in strain relief
- Lead free in comply with EU RoHS 2011/65/EU directives





Mechanical Data

- Case: PDFN7656
- Terminal: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: For uni-directional types the band denotes cathode end, no marking on bi-directional types
- Approx. Weight: 0.183g

Applications

- I/O interface
- AC/DC power supply
- Vcc bus
- Low frequency signal transmission line (RS232, RS485, etc.)

Ordering Information

Part Number	Marking	Shipping	Reel
LTVxxA(C)Q	See the Table	5000PCS Tape&Reel	13 inchs

Maximum Ratings and Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified.

Rating	Symbol	Value	Unit
Peak pulse power dissipation at 10/1000μs waveform (Note1, Note2, Fig.1)	P_{PPM}	Minimum 3000	W
Peak pulse current of at 10/1000μs waveform (Note 1, Fig.3)	I_{PPM}	See Table	A
Steady state power dissipation at T_A=50℃ (Fig.5)	$P_{M(AV)}$	6.5	W
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note3, Fig.6)	I_{FSM}	300	A
Operating junction and Storage Temperature Range.	T_J,T_{STG}	-55 to +150	℃
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	℃/W

Notes: (1) Non-repetitive current pulse, per Fig.3 and derated above T_A=25℃ per Fig.2.
(2) Mounted on 8.0mm×8.0mm copper pads to each terminal.
(3) 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum, unidirectional only.

Electrical Characteristics (T_A=25℃)

Part Number (Uni)	Part Number (Bi)	Marking	Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts)@ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C @I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R @V_R (μA)
				Min	Max				
LTV5.0AQ	LTV5.0CQ	5Q	5.0	6.40	7.00	10	9.2	326.1	800
LTV6.0AQ	LTV6.0CQ	6Q	6.0	6.67	7.37	10	10.3	291.3	500
LTV6.5AQ	LTV6.5CQ	6Q5	6.5	7.22	7.98	10	11.2	267.9	400
LTV7.0AQ	LTV7.0CQ	7Q	7.0	7.78	8.60	10	12.0	250.0	200
LTV7.5AQ	LTV7.5CQ	7Q5	7.5	8.33	9.21	1	12.9	232.6	100
LTV8.0AQ	LTV8.0CQ	8Q	8.0	8.89	9.83	1	13.6	220.6	50
LTV8.5AQ	LTV8.5CQ	8Q5	8.5	9.44	10.40	1	14.4	208.3	20
LTV9.0AQ	LTV9.0CQ	9Q	9.0	10.00	11.10	1	15.4	194.8	10
LTV10AQ	LTV10CQ	10Q	10.0	11.10	12.30	1	17.0	176.5	5
LTV11AQ	LTV11CQ	11Q	11.0	12.20	13.50	1	18.2	164.8	2
LTV12AQ	LTV12CQ	12Q	12.0	13.30	14.70	1	19.9	150.8	2
LTV13AQ	LTV13CQ	13Q	13.0	14.40	15.90	1	21.5	139.5	2
LTV14AQ	LTV14CQ	14Q	14.0	15.60	17.20	1	23.2	129.3	2
LTV15AQ	LTV15CQ	15Q	15.0	16.70	18.50	1	24.4	123.0	2
LTV16AQ	LTV16CQ	16Q	16.0	17.80	19.70	1	26.0	115.4	2
LTV17AQ	LTV17CQ	17Q	17.0	18.90	20.90	1	27.6	108.7	2
LTV18AQ	LTV18CQ	18Q	18.0	20.00	22.10	1	29.2	102.7	2
LTV20AQ	LTV20CQ	20Q	20.0	22.20	24.50	1	32.4	92.6	2
LTV22AQ	LTV22CQ	22Q	22.0	24.40	26.90	1	35.5	84.5	2
LTV24AQ	LTV24CQ	24Q	24.0	26.70	29.50	1	38.9	77.1	2
LTV26AQ	LTV26CQ	26Q	26.0	28.90	31.90	1	42.1	71.3	2
LTV28AQ	LTV28CQ	28Q	28.0	31.10	34.40	1	45.4	66.1	2
LTV30AQ	LTV30CQ	30Q	30.0	33.30	36.80	1	48.4	62.0	2
LTV33AQ	LTV33CQ	33Q	33.0	36.70	40.60	1	53.3	56.3	2
LTV36AQ	LTV36CQ	36Q	36.0	40.00	44.20	1	58.1	51.6	2
LTV40AQ	LTV40CQ	40Q	40.0	44.40	49.10	1	64.5	46.5	2
LTV43AQ	LTV43CQ	43Q	43.0	47.80	52.80	1	69.4	43.2	2
LTV45AQ	LTV45CQ	45Q	45.0	50.00	55.30	1	72.7	41.3	2
LTV48AQ	LTV48CQ	48Q	48.0	53.30	58.90	1	77.4	38.8	2
LTV51AQ	LTV51CQ	51Q	51.0	56.70	62.70	1	82.4	36.4	2
LTV54AQ	LTV54CQ	54Q	54.0	60.00	66.30	1	87.1	34.4	2
LTV58AQ	LTV58CQ	58Q	58.0	64.40	71.20	1	93.6	32.1	2
LTV60AQ	LTV60CQ	60Q	60.0	66.70	73.70	1	96.8	31.0	2
LTV64AQ	LTV64CQ	64Q	64.0	71.10	78.60	1	103.0	29.1	2
LTV70AQ	LTV70CQ	70Q	70.0	77.80	86.00	1	113.0	26.5	2
LTV75AQ	LTV75CQ	75Q	75.0	83.30	92.10	1	121.0	24.8	2
LTV78AQ	LTV78CQ	78Q	78.0	86.70	95.80	1	126.0	23.8	2
LTV85AQ	LTV85CQ	85Q	85.0	94.40	104.00	1	137.0	21.9	2
LTV90AQ	LTV90CQ	90Q	90.0	100.00	111.00	1	146.0	20.5	2
LTV100AQ	LTV100CQ	100Q	100.0	111.00	123.00	1	162.0	18.5	2
LTV110AQ	LTV110CQ	110Q	110.0	122.00	135.00	1	177.0	16.9	2
LTV120AQ	LTV120CQ	120Q	120.0	133.00	147.00	1	193.0	15.5	2
LTV130AQ	LTV130CQ	130Q	130.0	144.00	159.00	1	209.0	14.4	2
LTV150AQ	LTV150CQ	150Q	150.0	167.00	185.00	1	243.0	12.3	2
LTV160AQ	LTV160CQ	160Q	160.0	178.00	197.00	1	259.0	11.6	2
LTV170AQ	LTV170CQ	170Q	170.0	189.00	209.00	1	275.0	10.9	2
LTV180AQ	LTV180CQ	180Q	180.0	201.00	222.00	1	292.0	10.3	2
LTV190AQ	LTV190CQ	190Q	190.0	211.00	233.00	1	308.0	9.7	2
LTV200AQ	LTV200CQ	200Q	200.0	224.00	247.00	1	324.0	9.3	2
LTV210AQ	LTV210CQ	210Q	210.0	237.00	263.00	1	340.0	8.8	2
LTV220AQ	LTV220CQ	220Q	220.0	246.00	272.00	1	356.0	8.4	2

Notes: For bidirectional type having V_R of 10V and less, the I_R limit is double.

Characteristics Curves (T_A=25°C unless otherwise noted)

FIG.1 PEAK PULSE POWER RATING CURVE

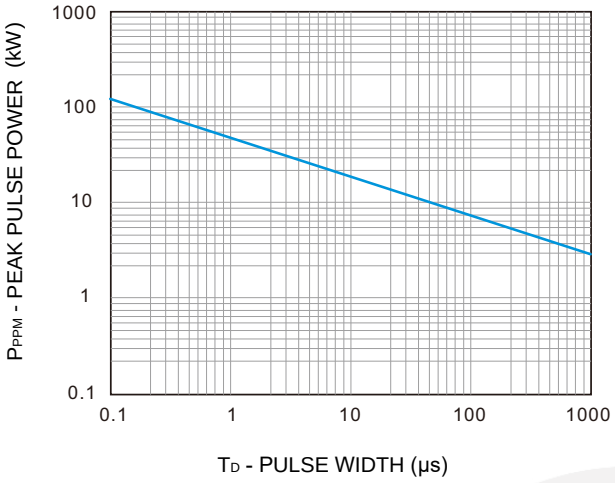


FIG.2 PULSE DERATING CURVE

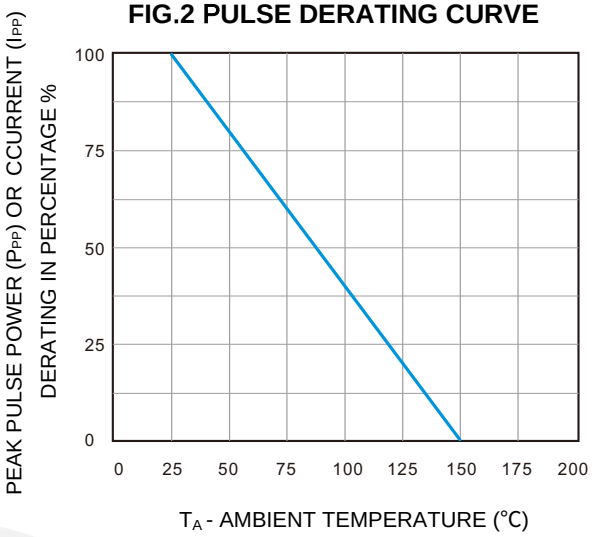


FIG.3 PULSE WAVEFORM

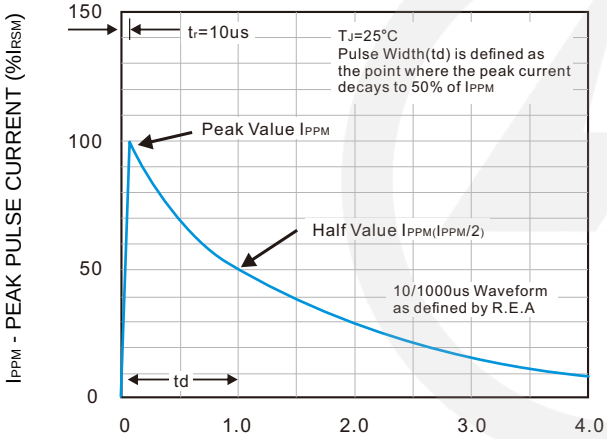


FIG.4 TYPICAL JUNCTION CAPACITANCE

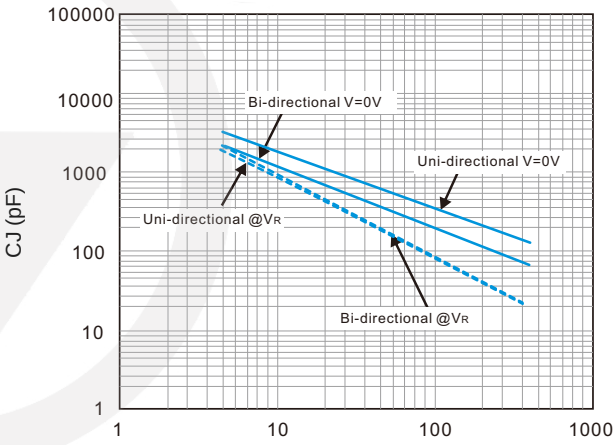


FIG.5 STEADY STATE POWER DISSIPATION DERATING CURVE

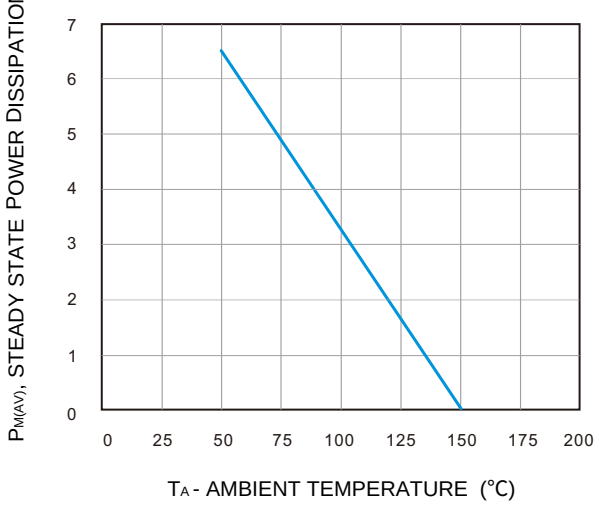
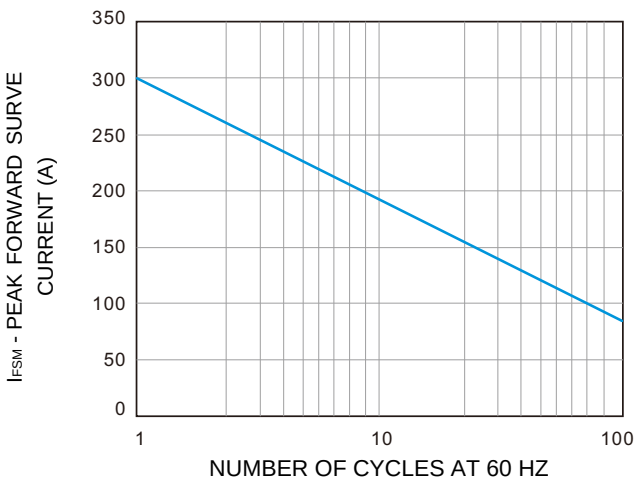


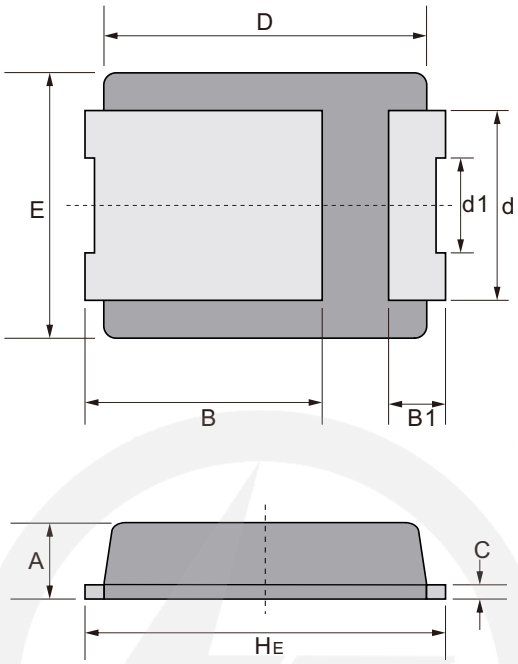
FIG.6 MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNI-DIRECTIONAL ONLY



Package Outline

PDFN7656

Unit：mm

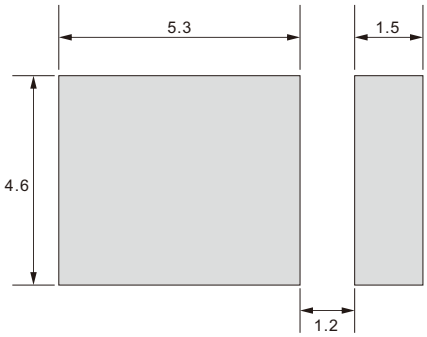


UNIT		A	B	B1	C	D	d	d1	E	HE
mm	max	1.70	5.20	1.40	0.40	7.00	4.20	2.10	5.80	7.80
	min	1.30	4.80	1.00	0.20	6.60	3.80	1.90	5.40	7.40

Suggested Pad Layout

PDFN7656

Unit：mm

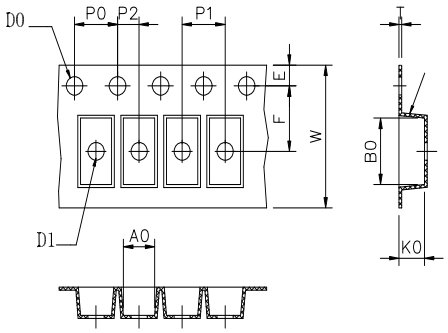


Note:

1. Controlling dimension:in millimeters.
2. General tolerance:±0.05mm
3. The pad layout is for reference purpose only.

Carrier Tape Dimensions

Unit：mm

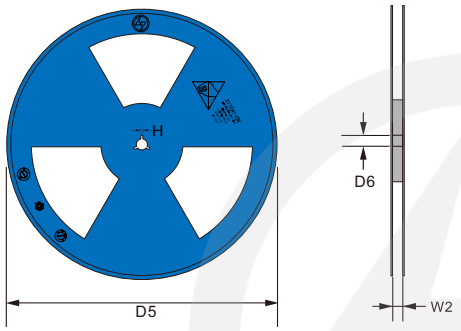


Symbol	Spec	Symbol	Spec
W	12.00±0.10	P1	8.00±0.10
E	1.75±0.10	P2	2.00±0.05
F	5.50±0.05	T	0.25±0.02
D0	1.55±0.05	A0	5.90±0.10
D1	1.55±0.10	B0	8.00±0.10
P0	4.00±0.10	K0	1.75±0.05

Reel Dimensions

Unit：mm

13” Reel

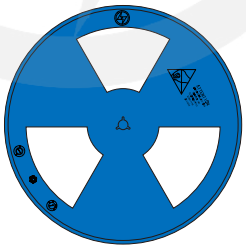


D5	Φ330.0±2.0
D6	Φ13.5±0.5
H	2.5±1.0
W2	12±1.0
Quantity: 5000PCS	

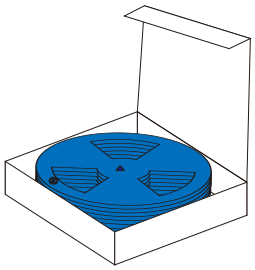
Packaging

PDFN7656

5000PCS/Reel



5Reel/Inner Box
25KPCS/Inner Box



Dim(Unit:mm)
340mm*340mm*85mm

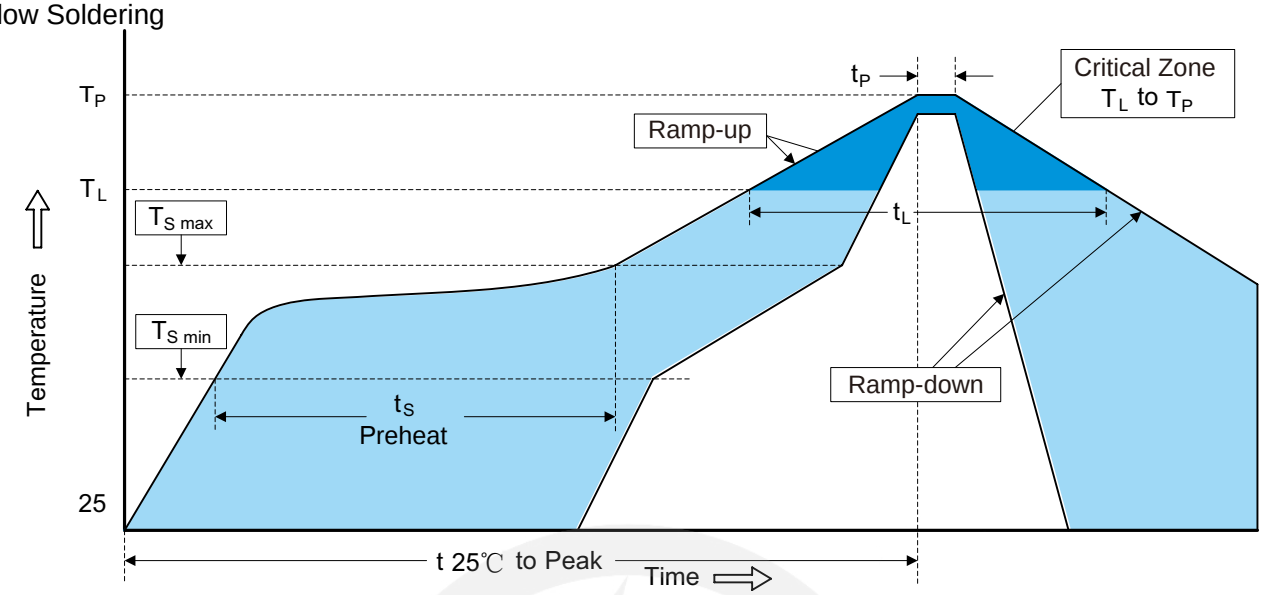
4 Boxs per carton
100KPCS per carton

Dim(Unit:mm)
360mm*360mm*355mm

13 inchs Reel

Recommended Soldering Conditions

Reflow Soldering



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3℃/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_S)	 150℃ 200℃ 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	 3℃/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	 217℃ 60-150 seconds
Peak Temperature (T_P)	260℃
Time within 5℃ of actual Peak Temperature (t_P)	20-40 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8 minutes max.

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Version Update Iformation

Series NO.	Enactment/Revision Date	Effective Date	Version	Revision Content	Revision Reason	Revision Person	Note
01	2024.03.01	2024.03.01	1.0	New file	/	Ding	
02	2025.02.27	2025.02.27	1.1	New Tape dimension	/	Ding	
03	2025.06.27	2025.06.27	1.2	T_J,T_{STG} Change to -55 to +150°C	/	Ding	
04	2026.01.10	2026.01.10	1.3	Modify Package Outline	/	Ding	