

1N6373 - 1N6381 Series (ICTE-5 - ICTE-36)



Description

These devices are designed to protect voltage sensitive components from high voltage, high-energy transients. They have excellent clamping capability, high surge capability, low zener impedance and fast response time. These devices are the Littelfuse exclusive, cost effective, highly reliable axial leaded package and are ideally suited for use in communication systems, numerical controls, process controls, medical equipment, business machines, power supplies and many other industrial/consumer applications, to protect CMOS, MOS and Bipolar integrated circuits

Features

- Working Peak Reverse Voltage Range - 5.0 V to 45 V
- Peak Power - 1500 Watts @ 1 ms
- ESD Rating of Class 3 (>16 KV) per Human Body Model
- Low Leakage < 5 μ A Above 10 V
- Response Time is Typically < 1 ns
- Pb-Free Packages are Available*

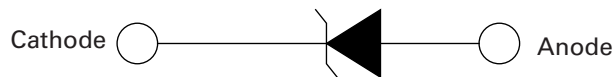
Maximum Ratings and Thermal Characteristics

Rating	Symbol	Value	Unit
Peak Power Dissipation (Note 1) @ $T_L = 25^\circ\text{C}$	P_{PK}	1500	W
Steady State Power Dissipation @ $T_L = 75^\circ\text{C}$, Lead Length = 3/8 \leq Derated above $T_L = 75^\circ\text{C}$	P_{PK}	5.0 20	W mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Lead	$R_{\theta JL}$	20	$^\circ\text{C/W}$
Forward Surge Current (Note 2) @ $T_A = 25^\circ\text{C}$	I_{FSM}	200	A
Operating and Storage Temperature Range	T_J, T_{stg}	-65 to +175	$^\circ\text{C/W}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Nonrepetitive current pulse per Figure 5 and derated above $T_A = 25^\circ\text{C}$ per Figure 2.
2. 1/2 sine wave (or equivalent square wave), PW = 8.3 ms, duty cycle = 4 pulses per minute maximum.

Functional Diagram



Additional Information



Datasheet

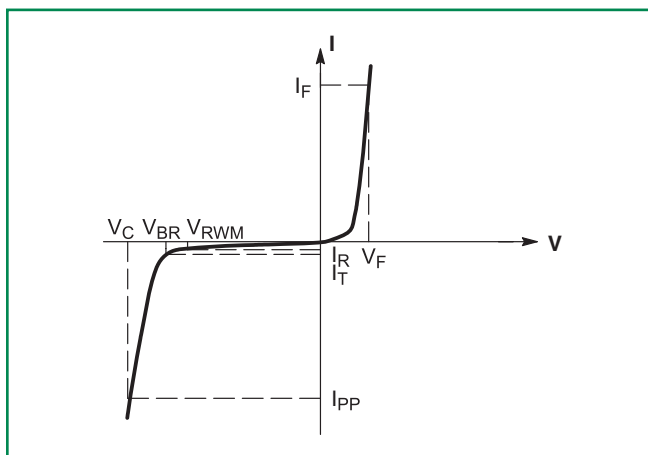


Resources



Samples

I-V Curve Characteristics (TA = 25 °C unless otherwise noted, VF = 3.5 V Max. @ IF (Note 3) = 100 A)



Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_F	Forward Current
V_F	Forward Voltage @ I_F

Ratings and Characteristic Curves

Figure 1. Pulse Rating Curve

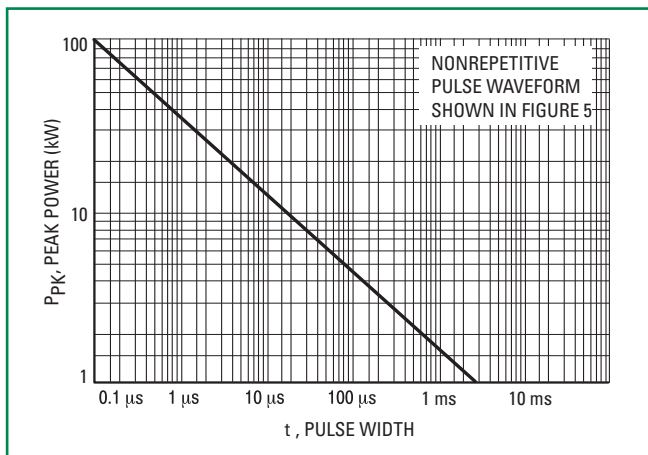


Figure 2. Pulse Derating Curve

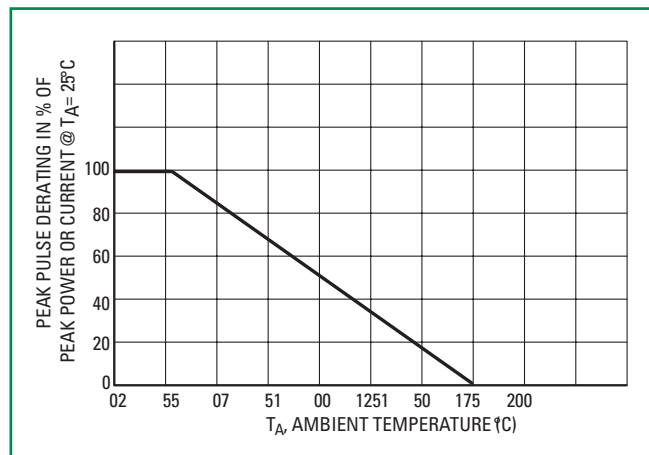


Figure 3. Capacitance versus Breakdown Voltage

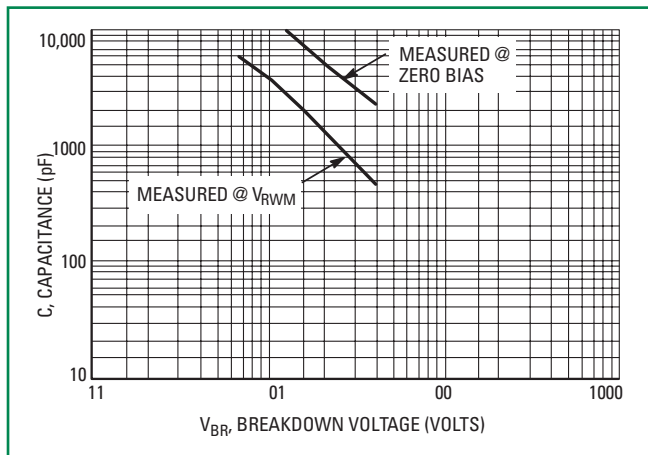


Figure 4. Steady State Power Derating

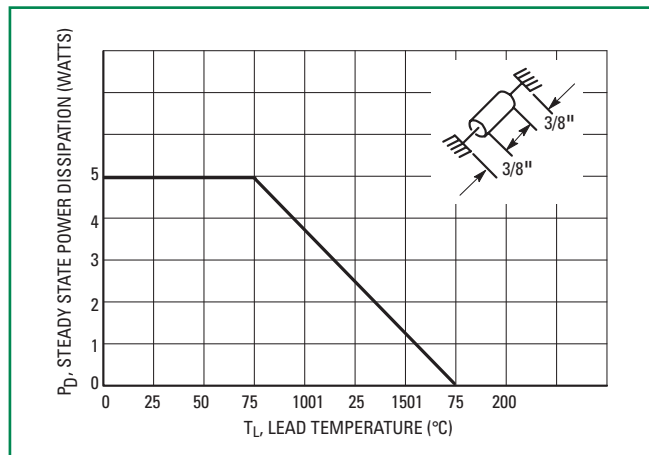


Figure 5. Pulse Waveform

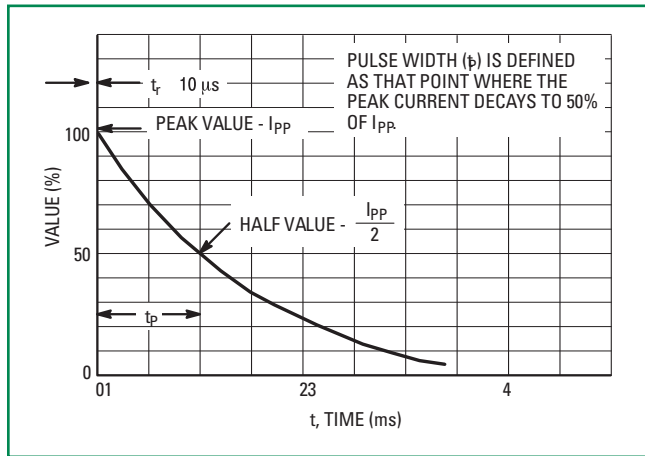


Figure 6. Dynamic Impedance

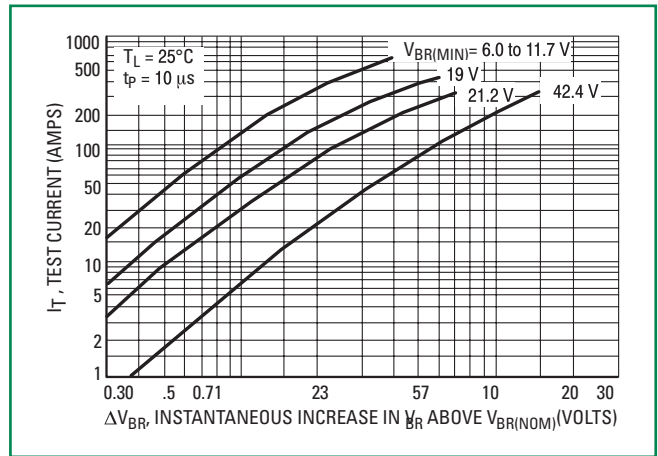
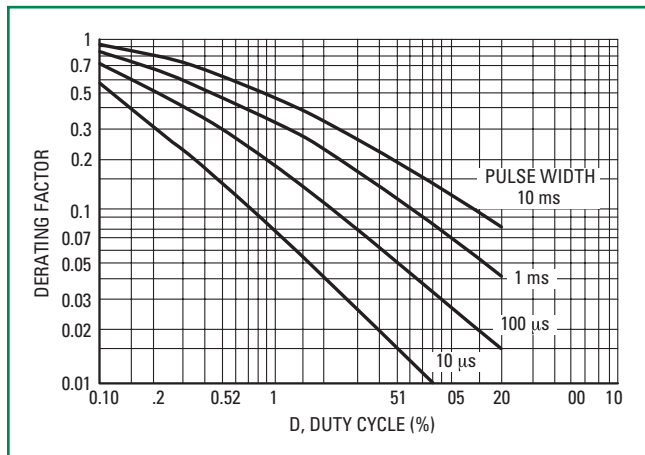


Figure 7. Typical Derating Factor for Duty Cycle



Electrical Characteristics (TA = 25 ° C unless otherwise noted, VF = 3.5 V Max. @ IF (Note 3) = 53 A)

JEDEC Device† (ON Device)	Device Marking	V _{RWM} (Note 4)	I _R @ V _{RWM}	Breakdown Voltage				V _C @ I _{PP} (Volts) (Note 6)		V _C (Volts) (Note 6)		CV _{BR} (mV/°C)
				V _{BR} (V) (Note 5)			@ I _T	V _C	I _{PP}	@ I _{PP} = 1 A	@ I _{PP} = 10 A	
				Min	Nom	Max	(mA)	(Volts)	(A)			
1N6373, G	1N6373	5.0	300	6.0	-	-	1.0	9.4	160	7.1	7.5	4.0
1N6374, G	1N6374	8.0	25	9.4	-	-	10	15	100	11.3	11.5	8.0
1N6375, G	1N6375	10	2.0	11.7	-	-	1.0	16.7	90	13.7	14.1	12
1N6376, G	1N6376	12	2.0	14.1	-	-	1.0	21.2	70	16.1	16.5	14
1N6377, G	1N6377	15	2.0	17.6	-	-	1.0	25	60	20.1	20.6	18
1N6380, G	1N6380	36	2.0	42.4	-	-	1.0	65.2	23	50.6	54.3	50
1N6381, G	1N6381	45	2.0	52.9	-	-	1.0	78.9	19	63.3	70	60
ICTE-5RLG	ICTE-5	5.0	300	6.0	-	-	1.0	9.4	160	7.1	7.5	4.0
ICTE-10RLG	ICTE-10	10	2.0	11.7	-	-	1.0	16.7	90	13.7	14.1	8.0
ICTE-12RLG	ICTE-12	12	2.0	14.1	-	-	1.0	21.2	70	16.1	16.5	12
ICTE-15RLG	ICTE-15	15	2.0	17.6	-	-	1.0	25	60	20.1	20.6	14
ICTE-18, G	ICTE-18	18	2.0	21.2	-	-	1.0	30	50	24.2	25.2	18
ICTE-36RLG	ICTE-36	36	2.0	42.4	-	-	1.0	65.2	23	50.6	54.3	26

3. Square waveform, PW = 8.3 ms, non-repetitive duty cycle.

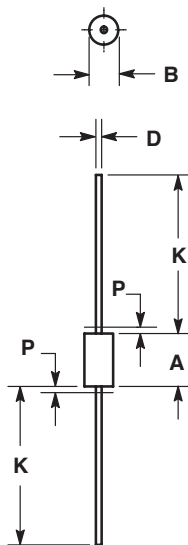
4. A transient suppressor is normally selected according to the maximum working peak reverse voltage (V_{RWM}), which should be equal to or greater than the DC or continuous peak operating voltage level.

5. V_{BR} measured at pulse test current I_T at an ambient temperature of 25°C and minimum voltage in V_{BR} is to be controlled.

6. Surge current waveform per Figure 5 and derate per Figures 1 and 2.

†The "G" suffix indicates Pb-Free package or Pb-Free packages are available.

Dimensions

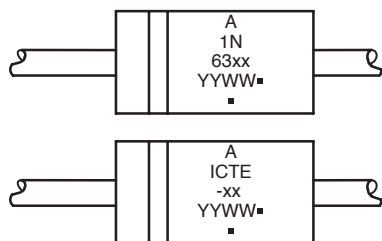


Dim	Inches		Millimeters	
	Min	Max	Min	Max
A	0.335	0.374	8.50	9.50
B	0.189	0.209	4.80	5.30
D	0.038	0.042	0.96	1.06
K	1.000	—	25.40	—
P	—	0.050	—	1.27

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. LEAD FINISH AND DIAMETER UNCONTROLLED IN DIMENSION P.
4. 041A-01 THRU 041A-03 OBSOLETE, NEW STANDARD 041A-04.

Part Marking System



- A= Assembly Location
1N63xx= JEDEC Device Code
ICTE-xx = ON Device Code
YY = Year
WW = Work Week
▪ = Pb-Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
1N63xx, G	Axial Lead (Pb-Free)	500 Units/Box
1N63xxRL4, G	Axial Lead (Pb-Free)	1500/Tape & Reel
ICTE-xx, G	Axial Lead (Pb-Free)	500 Units/Box
ICTE-xxRL4, G	Axial Lead (Pb-Free)	1500/Tape & Reel

Flow/Wave Soldering (Solder Dipping)

Peak Temperature :	260°C
Dipping Time :	1/16" from the case for 10 seconds

Physical Specifications

Case	Void-free, transfer-molded, thermosetting plastic
Leads	Modified L-Bend providing more contact area to bond pads
Finish	All external surfaces are corrosion resistant and leads are readily solderable
Mounting Position	Any

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