

JEDEC ABRUPT JUNCTION VARACTOR DIODES

- High Q and High Tuning Ratio
- Guaranteed Tuning Ratio and Temperature Coefficient
- Superior Reproducibility
- High Reliability
(state-of-the-art passivation plus hermetic packaging)

JEDEC REGISTERED

1N5139 A through 1N5148 A
1N5441 A, B, C through 1N5456 A, B, C
1N5461 A, B, C through 1N5476 A, B, C
DO-7 Glass Package

ELECTRICAL SPECIFICATIONS: $T_A = 25^\circ\text{C}$

C_T^{**} DIODE CAPACITANCE (pF) $\pm 10\%$ @ $V_R = 4\text{dc}$, $F = 1\text{MHz}$	MODEL NUMBER	Q, FIGURE OF MERIT $V_R = 4\text{dc}$, $F = 50\text{ MHz}$ MIN	T_R TUNING RATIO C_4 / C_{60} , $F = 1\text{MHz}$ MIN** / TYP / MAX**
6.8	1N5139A	350	2.7 / 2.9 / 3.2
8.2			
10	1N5140A	300	2.8 / 3.0 / 3.3
12	1N5141A	300	2.8 / 3.0 / 3.3
15	1N5142A	250	2.8 / 3.0 / 3.3
18	1N5143A	250	2.8 / 3.1 / 3.4
20			
22	1N5144A	200	3.2 / 3.4 / 3.5
27	1N5145A	200	3.2 / 3.4 / 3.5
33	1N5146A	200	3.2 / 3.4 / 3.5
39	1N5147A	200	3.2 / 3.4 / 3.5
47	1N5148A	200	3.2 / 3.4 / 3.5
56			
68			
82			
100			

PARAMETER	TEST CONDITIONS	UNIT	MIN **	TYP	MAX **
REVERSE BREAKDOWN VOLTAGE (V_{BR})	$I_R = 10\mu\text{A dc}$	Vdc	60	70	—
REVERSE LEAKAGE CURRENT (I_R)	$V_R = 55\text{Vdc}$, $T_A = 25^\circ\text{C}$ $V_R = 55\text{Vdc}$, $T_A = 150^\circ\text{C}$	$\mu\text{A dc}$	—	—	0.02 20
SERIES INDUCTANCE (L_S)	$f = 250\text{MHz}$, $L = 1/16"$	nH	—	5	—
CASE CAPACITANCE (C_C)	$f = 1\text{MHz}$, $L = 1/16"$	pF	—	0.25	—
DIODE CAPACITANCE TEMP COEFFICIENT (TC_C)	$V_R = 4\text{dc}$, $f = 1\text{MHz}$	ppm $^\circ\text{C}$	—	200	300
MAXIMUM RATINGS					
PARAMETER	VALUE	UNIT			
REVERSE VOLTAGE	60	Vdc			
DEVICE DISSIPATION @ $T_A = 25^\circ\text{C}$	400	mW			
DERATE ABOVE 25°C	2.67	mW/ $^\circ\text{C}$			
OPERATING JUNCTION TEMP RANGE	+175	$^\circ\text{C}$			
STORAGE TEMP RANGE	-65 TO +200	$^\circ\text{C}$			

Substitute suffix "B" for $\pm 5\% C_T$, suffix "C" for $\pm 2\% C_T$,
suffix "D" for $\pm 1\% C_T$. Delete suffix for $\pm 20\%$ tolerance.

**Indicates JEDEC registered data

SEMICONDUCTOR OPERATION

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Tuning Varactors

JEDEC ABRUPT JUNCTION VARACTOR DIODES

ELECTRICAL SPECIFICATIONS: $T_A = 25^\circ\text{C}$

DIODE CAPACITANCE (pF) $\pm 10\%$ @ $V_R = 4\text{dc}$, $f = 1\text{MHz}$	MODEL NUMBER	Q, FIGURE OF MERIT $V_R = 4\text{dc}$, $f = 50\text{ MHz}$ MIN	T_R TUNING RATIO C_2 / C_{30} , $f = 1\text{MHz}$ MIN** / TYP / MAX**	MODEL NUMBER	Q, FIGURE OF MERIT $V_R = 4\text{dc}$, $f = 50\text{ MHz}$ MIN	T_R TUNING RATIO C_2 / C_{30} , $f = 1\text{MHz}$ MIN** / TYP / MAX**
6.8	1N5441A	450	2.5 / 3.0 / 3.1	1N5461A	600	2.7 / 3.0 / 3.1
8.2	1N5442A	450	2.5 / 3.0 / 3.1	1N5462A	600	2.8 / 3.0 / 3.1
10	1N5443A	400	2.6 / 3.0 / 3.1	1N5463A	550	2.8 / 3.0 / 3.1
12	1N5444A	400	2.6 / 3.0 / 3.1	1N5464A	550	2.8 / 3.0 / 3.1
15	1N5445A	400	2.6 / 3.0 / 3.1	1N5465A	550	2.8 / 3.0 / 3.1
18	1N5446A	350	2.6 / 3.0 / 3.1	1N5466A	500	2.9 / 3.0 / 3.1
20	1N5447A	350	2.6 / 3.0 / 3.1	1N5467A	500	2.9 / 3.0 / 3.1
22	1N5448A	350	2.6 / 3.1 / 3.2	1N5468A	500	2.9 / 3.1 / 3.2
27	1N5449A	350	2.6 / 3.1 / 3.2	1N5469A	500	2.9 / 3.1 / 3.2
33	1N5450A	350	2.6 / 3.1 / 3.2	1N5470A	500	2.9 / 3.1 / 3.2
39	1N5451A	300	2.6 / 3.1 / 3.2	1N5471A	450	2.9 / 3.1 / 3.2
47	1N5452A	250	2.6 / 3.1 / 3.2	1N5472A	400	2.9 / 3.1 / 3.2
56	1N5453A	200	2.6 / 3.2 / 3.3	1N5473A	300	2.9 / 3.2 / 3.3
68	1N5454A	175	2.7 / 3.2 / 3.3	1N5474A	250	2.9 / 3.2 / 3.3
82	1N5455A	175	2.7 / 3.2 / 3.3	1N5475A	225	2.9 / 3.2 / 3.3
100	1N5456A	175	2.7 / 3.2 / 3.3	1N5476A	200	2.9 / 3.2 / 3.3

PARAMETER	TEST CONDITIONS	UNIT	MIN **	TYP	MAX **	TEST CONDITIONS	UNIT	MIN **	TYP	MAX **
REVERSE BREAKDOWN VOLTAGE (V_{BR})	$I_R = 10\mu\text{Adc}$	Vdc	30	—	—	$I_R = 10\text{mAdc}$	Vdc	30	—	—
REVERSE LEAKAGE CURRENT (I_R)	$V_R = 25\text{Vdc}$, $T_A = 25^\circ\text{C}$ $V_R = 25\text{Vdc}$, $T_A = 150^\circ\text{C}$	μAdc	— —	— —	0.02 20	$V_R = 25\text{Vdc}$, $T_A = 25^\circ\text{C}$ $V_R = 25\text{Vdc}$, $T_A = 150^\circ\text{C}$	μAdc	— —	— —	0.02 20
SERIES INDUCTANCE (L_s)	$f = 250\text{MHz}$, $L = 1/16"$	nH	—	4	10	$f = 250\text{MHz}$, $L = 1/16"$	nH	—	4	10
CASE CAPACITANCE (C_c)	$f = 1\text{MHz}$, $L = 1/16"$	pF	0.1	0.17	0.25	$f = 1\text{MHz}$, $L = 1/16"$	pF	0.1	0.17	0.25
DIODE CAPACITANCE TEMP COEFFICIENT (TC_C)	$V_R = 4\text{dc}$, $f = 1\text{MHz}$	ppm/ $^\circ\text{C}$	—	300	400	$V_R = 4\text{dc}$, $F = 1\text{MHz}$	ppm/ $^\circ\text{C}$	—	300	400

PARAMETER	VALUE	UNIT	PARAMETER	VALUE	UNIT
REVERSE VOLTAGE	30	Vdc	REVERSE VOLTAGE	30	Vdc
DEVICE DISSIPATION @ $T_A = 25^\circ\text{C}$	400	mW	DEVICE DISSIPATION @ $T_A = 25^\circ\text{C}$	400	mW
DERATE ABOVE 25°C	2.67	mW/ $^\circ\text{C}$	DERATE ABOVE 25°C	2.67	mW/ $^\circ\text{C}$
OPERATING JUNCTION TEMP RANGE	+175	$^\circ\text{C}$	OPERATING JUNCTION TEMP RANGE	+175	$^\circ\text{C}$
STORAGE TEMP RANGE	-65 TO +200	$^\circ\text{C}$	STORAGE TEMP RANGE	-65 TO +200	$^\circ\text{C}$

Substitute suffix "B" for $\pm 5\% C_T$, suffix "C" for $\pm 2\% C_T$, suffix "D" for $\pm 1\% C_T$. Delete suffix for $\pm 20\%$ tolerance.

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