



SMAJ

TVS

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS

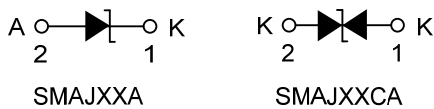
DESCRIPTION

The UTC **SMAJ** is a surface mount transient voltage suppressors, it uses UTC's advanced technology to provide customers with low leakage and very fast response time, etc.

FEATURES

- * Low leakage
- * Very fast response time

SYMBOL

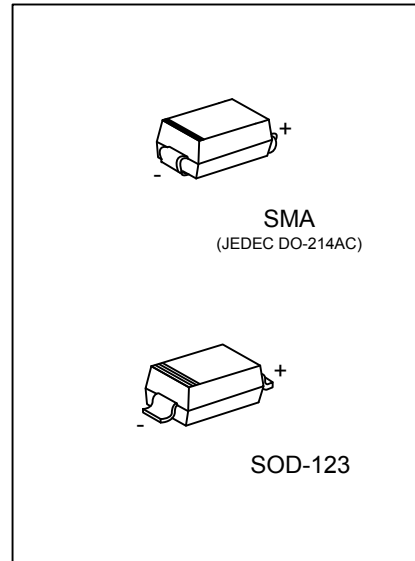


ORDERING INFORMATION

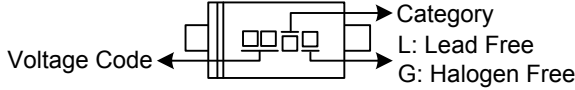
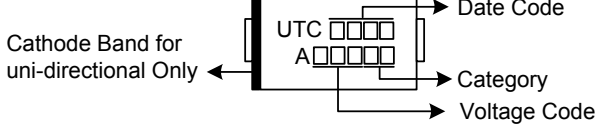
Ordering Number		Package	Pin Assignment		Packing
Lead Free	Halogen Free		1	2	
SMAJXXAL-CA2-R	SMAJXXAG-CA2-R	SOD-123	K	A	Tape Reel
SMAJXXAL-SMA-R	SMAJXXAG-SMA-R	SMA	K	A	Tape Reel
SMAJXXCAL-SMA-R	SMAJXXCAG-SMA-R	SMA	K	K	Tape Reel

Note: Pin Assignment: K: Cathode A: Anode

<p>SMAJXXXG-CA2-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package (4)Category (5)Output Voltage Code</p>	<p>(1) R: Tape Reel (2) CA2: SOD-123, SMA: SMA (3) G: Halogen Free and Lead Free, L: Lead Free (4) A: 5% uni-directional, CA: 5% Bi-directional (5) xx: refer to ELECTRICAL CHARACTERISTICS</p>
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■ MARKING

PACKAGE	MARKING
SOD-123	 <p>Voltage Code ← [Diagram] → Category L: Lead Free G: Halogen Free</p>
SMA	 <p>Cathode Band for uni-directional Only ← [Diagram] → Date Code UTC [Diagram] A [Diagram] → Category → Voltage Code</p>

Note: Product Model, Category and Voltage Code refer to ELECTRICAL CHARACTERISTICS.

■ ABSOLUTE MAXIMUM RATING ($T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	RATINGS	UNIT
Peak Power Dissipation with a 10/1000 μs Waveform (Note 2)	P_{PP}	400	W
Peak Pulse Current with a 10/1000 μs Waveform (Note 2)	I_{PP}	See ELECTRICAL CHARACTERISTICS Table	A
Power Dissipation On Infinite Heatsink at $T_L = 75^\circ\text{C}$	SOD-123	1.0	W
	SMA	3.3	W
Peak Forward Surge Current, 8.3 ms Single Half Sine-wave Unidirectional Only (Note 3)	I_{FSM}	40	A
Maximum Instantaneous Forward Voltage at 25 A for Unidirectional Only	V_F	3.5	V
Operating Junction Temperature	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

- Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
 2. Non-repetitive current pulse and derated above $T_A=25^\circ\text{C}$
 3. Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise noted)

PART NUMBER		MARKING CODE		BREAKDOWN VOLTAGE V_{BR} @ I_T			MAXIMUM REVERSE LEAKAGE	WORKING PEAK REVERSE VOLTAGE	MAXIMUM REVERSE SURGE CURRENT	MAXIMUM CLAMPING VOLTAGE
UNI	BI	UNI	BI	MIN (V)	MAX (V)	I_T (mA)	I_R @ V_{RWM} (μA)	V_{RWM} (V)	I_{PP} (A)	V_C @ I_{PP} (V)
SMAJ5.0	SMAJ5.0C	A5.0	A5.0C	6.40	7.30	10	800	5.0	41.67	9.6
SMAJ5.0A	SMAJ5.0CA	A5.0A	A5.0CA	6.40	7.00	10	800	5.0	43.48	9.2
SMAJ6.0	SMAJ6.0C	A6.0	A6.0C	6.67	8.15	10	800	6.0	35.09	11.4
SMAJ6.0A	SMAJ6.0CA	A6.0A	A6.0CA	6.67	7.37	10	800	6.0	38.83	10.3
SMAJ6.5	SMAJ6.5C	A6.5	A6.5C	7.22	8.82	10	500	6.5	32.52	12.3
SMAJ6.5A	SMAJ6.5CA	A6.5A	A6.5CA	7.22	7.98	10	500	6.5	35.71	11.2
SMAJ7.0	SMAJ7.0C	A7.0	A7.0C	7.78	9.51	10	200	7.0	30.08	13.3
SMAJ7.0A	SMAJ7.0CA	A7.0A	A7.0CA	7.78	8.60	10	200	7.0	33.33	12.0
SMAJ7.5	SMAJ7.5C	A7.5	A7.5C	8.33	10.20	1	100	7.5	27.97	14.3
SMAJ7.5A	SMAJ7.5CA	A7.5A	A7.5CA	8.33	9.21	1	100	7.5	31.01	12.9
SMAJ8.0	SMAJ8.0C	A8.0	A8.0C	8.89	10.90	1	50	8.0	26.67	15.0
SMAJ8.0A	SMAJ8.0CA	A8.0A	A8.0CA	8.89	9.83	1	50	8.0	29.41	13.6
SMAJ8.5	SMAJ8.5C	A8.5	A8.5C	9.44	11.50	1	10	8.5	25.16	15.9
SMAJ8.5A	SMAJ8.5CA	A8.5A	A8.5CA	9.44	10.40	1	10	8.5	27.78	14.4
SMAJ9.0	SMAJ9.0C	A9.0	A9.0C	10.00	12.20	1	5	9.0	23.67	16.9
SMAJ9.0A	SMAJ9.0CA	A9.0A	A9.0CA	10.00	11.10	1	5	9.0	25.97	15.4
SMAJ10	SMAJ10C	A10	A10C	11.10	13.60	1	5	10.0	21.28	18.8
SMAJ10A	SMAJ10CA	A10A	A10CA	11.10	12.30	1	5	10.0	23.53	17.0
SMAJ11	SMAJ11C	A11	A11C	12.20	14.90	1	1	11.0	19.90	20.1
SMAJ11A	SMAJ11CA	A11A	A11CA	12.20	13.50	1	1	11.0	21.98	18.2
SMAJ12	SMAJ12C	A12	A12C	13.30	16.30	1	1	12.0	18.18	22.0
SMAJ12A	SMAJ12CA	A12A	A12CA	13.30	14.70	1	1	12.0	20.10	19.9
SMAJ13	SMAJ13C	A13	A13C	14.40	17.60	1	1	13.0	16.81	23.8
SMAJ13A	SMAJ13CA	A13A	A13CA	14.40	15.90	1	1	13.0	18.60	21.5
SMAJ14	SMAJ14C	A14	A14C	15.60	19.10	1	1	14.0	15.50	25.8
SMAJ14A	SMAJ14CA	A14A	A14CA	15.60	17.20	1	1	14.0	17.24	23.2
SMAJ15	SMAJ15C	A15	A15C	16.70	20.40	1	1	15.0	14.87	26.9
SMAJ15A	SMAJ15CA	A15A	A15CA	16.70	18.50	1	1	15.0	16.39	24.4

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise noted)

PART NUMBER		MARKING CODE		BREAKDOWN VOLTAGE V _{BR} @ I _T			MAXIMUM REVERSE LEAKAGE I _R @ V _{RWM} (μA)	WORKING PEAK REVERSE VOLTAGE V _{RWM} (V)	MAXIMUM REVERSE SURGE CURRENT I _{PP} (A)	MAXIMUM CLAMPING VOLTAGE V _C @ I _{PP} (V)
UNI	BI	UNI	BI	MIN (V)	MAX (V)	I _T (mA)				
SMAJ16	SMAJ16C	A16	A16C	17.80	21.80	1	1	16.0	13.89	28.8
SMAJ16A	SMAJ16CA	A16A	A16CA	17.80	19.70	1	1	16.0	15.38	26.0
SMAJ17	SMAJ17C	A17	A17C	18.90	23.10	1	1	17.0	13.11	30.5
SMAJ17A	SMAJ17CA	A17A	A17CA	18.90	20.90	1	1	17.0	14.49	27.6
SMAJ18	SMAJ18C	A18	A18C	20.00	24.40	1	1	18.0	12.42	32.2
SMAJ18A	SMAJ18CA	A18A	A18CA	20.00	22.10	1	1	18.0	13.70	29.2
SMAJ19	SMAJ19C	A19	A19C	21.13	25.76	1	1	19.0	11.76	34.0
SMAJ19A	SMAJ19CA	A19A	A19CA	21.10	23.30	1	1	19.0	13.00	30.8
SMAJ20	SMAJ20C	A20	A20C	22.20	27.10	1	1	20.0	11.17	35.8
SMAJ20A	SMAJ20CA	A20A	A20CA	22.20	24.50	1	1	20.0	12.35	32.4
SMAJ22	SMAJ22C	A22	A22C	24.40	29.80	1	1	22.0	10.15	39.4
SMAJ22A	SMAJ22CA	A22A	A22CA	24.40	26.90	1	1	22.0	11.27	35.5
SMAJ24	SMAJ24C	A24	A24C	26.70	32.60	1	1	24.0	9.30	43.0
SMAJ24A	SMAJ24CA	A24A	A24CA	26.70	29.50	1	1	24.0	10.28	38.9
SMAJ26	SMAJ26C	A26	A26C	28.90	35.30	1	1	26.0	8.58	46.6
SMAJ26A	SMAJ26CA	A26A	A26CA	28.90	31.90	1	1	26.0	9.50	42.1
SMAJ28	SMAJ28C	A28	A28C	31.10	38.00	1	1	28.0	8.00	50.0
SMAJ28A	SMAJ28CA	A28A	A28CA	31.10	34.40	1	1	28.0	8.81	45.4
SMAJ30	SMAJ30C	A30	A30C	33.30	40.70	1	1	30.0	7.48	53.5
SMAJ30A	SMAJ30CA	A30A	A30CA	33.30	36.80	1	1	30.0	8.26	48.4
SMAJ33	SMAJ33C	A33	A33C	36.70	44.90	1	1	33.0	6.78	59.0
SMAJ33A	SMAJ33CA	A33A	A33CA	36.70	40.60	1	1	33.0	7.50	53.3
SMAJ36	SMAJ36C	A36	A36C	40.00	48.90	1	1	36.0	6.22	64.3
SMAJ36A	SMAJ36CA	A36A	A36CA	40.00	44.20	1	1	36.0	6.88	58.1
SMAJ40	SMAJ40C	A40	A40C	44.40	54.30	1	1	40.0	5.60	71.4
SMAJ40A	SMAJ40CA	A40A	A40CA	44.40	49.10	1	1	40.0	6.20	64.5
SMAJ43	SMAJ43C	A43	A43C	47.80	58.40	1	1	43.0	5.22	76.7
SMAJ43A	SMAJ43CA	A43A	A43CA	47.80	52.80	1	1	43.0	5.76	69.4
SMAJ45	SMAJ45C	A45	A45C	50.00	61.10	1	1	45.0	4.98	80.3
SMAJ45A	SMAJ45CA	A45A	A45CA	50.00	55.30	1	1	45.0	5.50	72.7
SMAJ48	SMAJ48C	A48	A48C	53.30	65.10	1	1	48.0	4.68	85.5
SMAJ48A	SMAJ48CA	A48A	A48CA	53.30	58.90	1	1	48.0	5.17	77.4
SMAJ51	SMAJ51C	A51	A51C	56.70	69.30	1	1	51.0	4.39	91.1
SMAJ51A	SMAJ51CA	A51A	A51CA	56.70	62.70	1	1	51.0	4.85	82.4
SMAJ54	SMAJ54C	A54	A54C	60.00	73.30	1	1	54.0	4.15	96.3
SMAJ54A	SMAJ54CA	A54A	A54CA	60.00	66.30	1	1	54.0	4.59	87.1
SMAJ58	SMAJ58C	A58	A58C	64.40	78.70	1	1	58.0	3.88	103.0
SMAJ58A	SMAJ58CA	A58A	A58CA	64.40	71.20	1	1	58.0	4.27	93.6
SMAJ60	SMAJ60C	A60	A60C	66.70	81.50	1	1	60.0	3.74	107.0
SMAJ60A	SMAJ60CA	A60A	A60CA	66.70	73.70	1	1	60.0	4.13	96.8
SMAJ64	SMAJ64C	A64	A64C	71.10	86.90	1	1	64.0	3.51	114.0
SMAJ64A	SMAJ64CA	A64A	A64CA	71.10	78.60	1	1	64.0	3.88	103.0
SMAJ70	SMAJ70C	A70	A70C	77.80	95.10	1	1	70.0	3.20	125.0
SMAJ70A	SMAJ70CA	A70A	A70CA	77.80	86.00	1	1	70.0	3.54	113.0
SMAJ75	SMAJ75C	A75	A75C	83.30	102.00	1	1	75.0	2.99	134.0
SMAJ75A	SMAJ75CA	A75A	A75CA	83.30	92.10	1	1	75.0	3.31	121.0

■ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

PART NUMBER		MARKING CODE		BREAKDOWN VOLTAGE V_{BR} @ I_T			MAXIMUM REVERSE LEAKAGE I_R @ V_{RWM} (μA)	WORKING PEAK REVERSE VOLTAGE V_{RWM} (V)	MAXIMUM REVERSE SURGE CURRENT I_{PP} (A)	MAXIMUM CLAMPING VOLTAGE V_C @ I_{PP} (V)
UNI	BI	UNI	BI	MIN (V)	MAX (V)	I_T (mA)				
SMAJ78	SMAJ78C	A78	A78C	86.70	106.00	1	1	78.0	2.88	139.0
SMAJ78A	SMAJ78CA	A78A	A78CA	86.70	95.80	1	1	78.0	3.17	126.0
SMAJ80	SMAJ80C	A80	A80C	88.96	108.80	1	1	80.0	2.79	143.2
SMAJ80A	SMAJ80CA	A80A	A80CA	88.80	97.60	1	1	80.0	3.09	129.6
SMAJ85	SMAJ85C	A85	A85C	94.40	115.00	1	1	85.0	2.65	151.0
SMAJ85A	SMAJ85CA	A85A	A85CA	94.40	104.00	1	1	85.0	2.92	137.0
SMAJ90	SMAJ90C	A90	A90C	100.00	122.00	1	1	90.0	2.50	160.0
SMAJ90A	SMAJ90CA	A90A	A90CA	100.00	111.00	1	1	90.0	2.74	146.0
SMAJ100	SMAJ100C	A100	A100C	111.00	136.00	1	1	100.0	2.23	179.0
SMAJ100A	SMAJ100CA	A100A	A100CA	111.00	123.00	1	1	100.0	2.47	162.0
SMAJ110	SMAJ110C	A110	A110C	122.00	149.00	1	1	110.0	2.04	196.0
SMAJ110A	SMAJ110CA	A110A	A110CA	122.00	135.00	1	1	110.0	2.26	177.0
SMAJ120	SMAJ120C	A120	A120C	133.00	163.00	1	1	120.0	1.87	214.0
SMAJ120A	SMAJ120CA	A120A	A120CA	133.00	147.00	1	1	120.0	2.07	193.0
SMAJ130	SMAJ130C	A130	A130C	144.00	176.00	1	1	130.0	1.73	231.0
SMAJ130A	SMAJ130CA	A130A	A130CA	144.00	159.00	1	1	130.0	1.91	209.0
SMAJ140	SMAJ140C	A140	A140C	155.68	190.40	1	1	140.0	1.60	250.6
SMAJ140A	SMAJ140CA	A140A	A140CA	155.00	171.00	1	1	140.0	1.76	226.8
SMAJ150	SMAJ150C	A150	A150C	167.00	204.00	1	1	150.0	1.49	268.0
SMAJ150A	SMAJ150CA	A150A	A150CA	167.00	185.00	1	1	150.0	1.65	243.0
SMAJ160	SMAJ160C	A160	A160C	178.00	218.00	1	1	160.0	1.39	287.0
SMAJ160A	SMAJ160CA	A160A	A160CA	178.00	197.00	1	1	160.0	1.54	259.0
SMAJ170	SMAJ170C	A170	A170C	189.00	231.00	1	1	170.0	1.32	304.0
SMAJ170A	SMAJ170CA	A170A	A170CA	189.00	209.00	1	1	170.0	1.45	275.0
SMAJ180	SMAJ180C	A180	A180C	200.16	244.80	1	1	180.0	1.24	322.2
SMAJ180A	SMAJ180CA	A180A	A180CA	200.00	220.00	1	1	180.0	1.37	291.6
SMAJ190	SMAJ190C	A190	A190C	211.28	258.40	1	1	190.0	1.18	340.1
SMAJ190A	SMAJ190CA	A190A	A190CA	211.00	232.00	1	1	190.0	1.30	307.8
SMAJ200A	SMAJ200CA	A200A	A200CA	224.00	247.00	1	1	200.0	1.23	324.0
SMAJ220A	SMAJ220CA	A220A	A220CA	246.00	272.00	1	1	220.0	1.12	356.0
SMAJ250A	SMAJ250CA	A250A	A250CA	279.00	309.00	1	1	250.0	0.99	405.0
SMAJ300A	SMAJ300CA	A300A	A300CA	335.00	371.00	1	1	300.0	0.82	486.0
SMAJ350A	SMAJ350CA	A350A	A350CA	391.00	432.00	1	1	350.0	0.71	567.0
SMAJ400A	SMAJ400CA	A400A	A400CA	447.00	494.00	1	1	400.0	0.62	648.0
SMAJ440A	SMAJ440CA	A440A	A440CA	492.00	543.00	1	1	440.0	0.56	713.0

■ TYPICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise noted)

Fig 1. Pulse Derating Curve

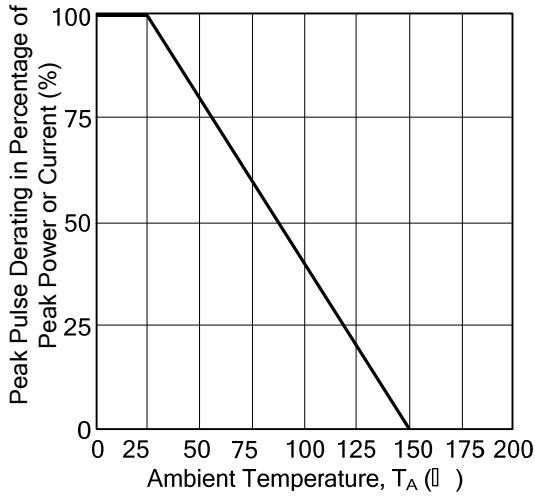


Fig 2. Maximum Non-Repetitive Surge Current

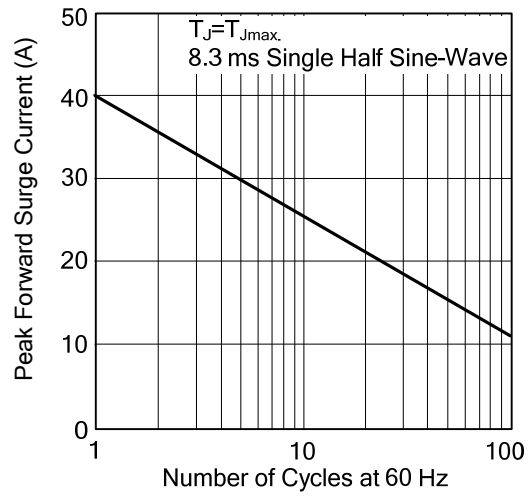


Fig 3. Steady State Power Derating Curve

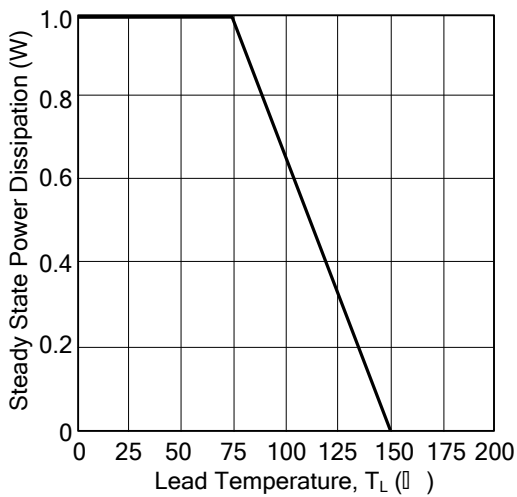


Fig 4. Peak Pulse Power Rating Curve

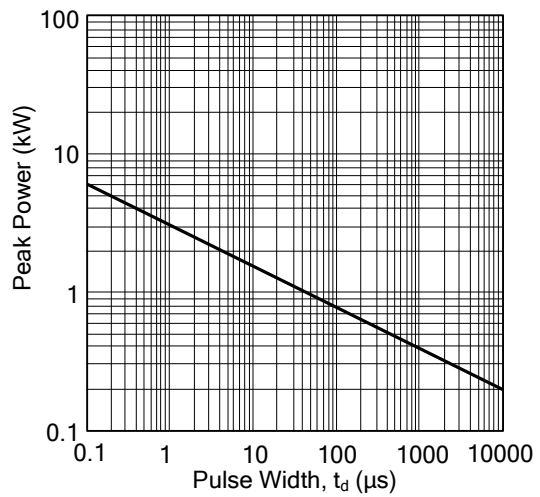


Fig 5. Pulse Waveform

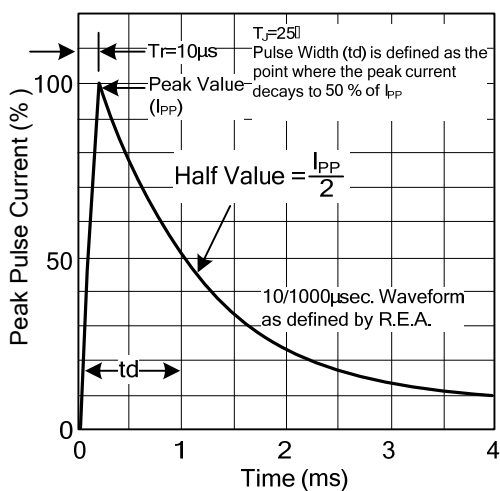
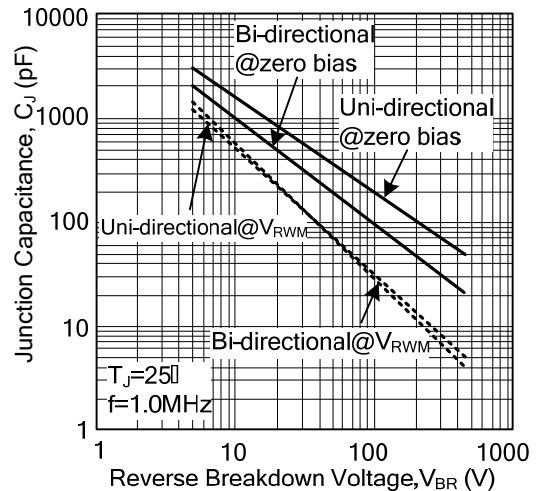


Fig 6. Typical Junction Capacitance



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