600W, 6.8V - 440V Transient Voltage Suppressor

FEATURES

- AEC-Q101 qualified available
- Excellent clamping capability
- Low dynamic impedance
- 600W surge capability at 10/1000μs waveform
- Fast response time: Typically less than 1.0ps from 0 volt to V_{BR} for unidirectional and 5.0ns for bidirectional
- Typical I_R less than 1μA above 10V
- UL recognized file # E-326243
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
V_{WM}	5.5 - 376	V
V_{BR} (uni - directional)	6.12 - 462	V
V_{BR} (bi - directional)	6.12 - 462	V
P_{PK}	600	W
$T_{J\ MAX}$	175	
Package	DO-204AC (DO-15)	
Configuration	Single die	

APPLICATIONS

- Protect sensitive circuit from damage by high voltage transients
- Lighting, ESD transient voltage protection of IC, system
- Inductive switching load protection of IC, system
- Electrical Fast Transient Immunity protection of IC, system

MECHANICAL DATA

- Case: : DO-204AC (DO-15)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Pure tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 0.400g (approximately)

DO-204AC (DO-15)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Non-repetitive peak impulse power dissipation with 10/1000μs waveform(1)	P_{PK}	600	W
Steady state power dissipation at T_A = 75°C lead lengths .375", 9.5mm(2)	P_D	5	W
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load for Uni-directional only(3)	I_{FSM}	100	A
Junction temperature	T_J	- 55 to +175	°C
Storage temperature	T_{STG}	- 55 to +175	°C

Notes:

1. Non-repetitive current pulse per Fig.3 and derated above T_A = 25°C per Fig.2
2. Mounted on 5 x 5 mm copper pads to each terminal
3. 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

Devices for Bipolar Applications

1. For bidirectional use C or CA suffix for types P6KE6.8 - types P6KE440
2. Electrical characteristics apply in both directions

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

Part Number	Nominal Voltage (V)	Breakdown Voltage V_{BR} (V)		Test Current I_T (mA)	Stand-Off Voltage V_{WM} (V)	Maximum Reverse Leakage I_D@ V_{WM} (μA)	Maximum Peak Surge Current I_{PP} (A)	Maximum Clamping Voltage V_C@ I_{PPM} (V)	Maximum Temperature Coefficient of V_{BR} (%/°C)
		Min	Max						
P6KE6.8	6.8	6.12	7.48	10	5.50	1000	58.0	10.8	0.057
P6KE6.8A P6KE6V8A	6.8	6.46	7.14	10	5.80	1000	60.0	10.5	0.057
P6KE7.5	7.5	6.75	8.25	10	6.05	500	53.0	11.7	0.061
P6KE7.5A P6KE7V5A	7.5	7.13	7.88	10	6.40	500	55.0	11.3	0.061
P6KE8.2	8.2	7.38	9.02	10	6.63	200	50.0	12.5	0.065
P6KE8.2A P6KE8V2A	8.2	7.79	8.61	10	7.02	200	52.0	12.1	0.065
P6KE9.1	9.1	8.19	10.00	1	7.37	50	45.0	13.8	0.068
P6KE9.1A P6KE9V1A	9.1	8.65	9.55	1	7.78	50	47.0	13.4	0.068
P6KE10	10	9.00	11.00	1	8.10	10	42.0	15.0	0.073
P6KE10A	10	9.50	10.5	1	8.55	10	43.0	14.5	0.073
P6KE11	11	9.90	12.1	1	8.92	1	38.0	16.2	0.075
P6KE11A	11	10.5	11.6	1	9.40	1	40.0	15.6	0.075
P6KE12	12	10.8	13.2	1	9.72	1	36.0	17.3	0.078
P6KE12A	12	11.4	12.6	1	10.2	1	37.0	16.7	0.078
P6KE13	13	11.7	14.3	1	10.5	1	33.0	19.0	0.081
P6KE13A	13	12.4	13.7	1	11.1	1	34.0	18.2	0.081
P6KE15	15	13.5	16.5	1	12.1	1	28.0	22.0	0.084
P6KE15A	15	14.3	15.8	1	12.8	1	29.0	21.2	0.084
P6KE16	16	14.4	17.6	1	12.9	1	26.0	23.5	0.086
P6KE16A	16	15.2	16.8	1	13.6	1	28.0	22.5	0.086
P6KE18	18	16.2	19.8	1	14.5	1	23.0	26.5	0.088
P6KE18A	18	17.1	18.9	1	15.3	1	25.0	25.2	0.088
P6KE20	20	18.0	22.0	1	16.2	1	21.0	29.1	0.090
P6KE20A	20	19.0	21.0	1	17.1	1	22.0	27.7	0.090
P6KE22	22	19.8	24.2	1	17.8	1	19.0	31.9	0.092
P6KE22A	22	20.9	23.1	1	18.8	1	20.0	30.6	0.092
P6KE24	24	21.6	26.4	1	19.4	1	18.0	34.7	0.094
P6KE24A	24	22.8	25.2	1	20.5	1	19.0	33.2	0.094
P6KE27	27	24.3	29.7	1	21.8	1	16.0	39.1	0.096
P6KE27A	27	25.7	28.4	1	23.1	1	16.8	37.5	0.096
P6KE30	30	27.0	33.0	1	24.3	1	14.0	43.5	0.097
P6KE30A	30	28.5	31.5	1	25.6	1	15.0	41.4	0.097
P6KE30A	30	28.5	31.5	1	25.6	1	15.0	41.4	0.097
P6KE33	33	29.7	36.3	1	26.8	1	13.0	47.7	0.098
P6KE33A	33	31.4	34.7	1	28.2	1	13.8	45.7	0.098
P6KE36	36	32.4	39.6	1	29.1	1	12.0	52.0	0.099
P6KE36A	36	34.2	37.8	1	30.8	1	12.6	49.9	0.099
P6KE39	39	35.1	42.9	1	31.6	1	11.1	56.4	0.100
P6KE39A	39	37.1	41.0	1	33.3	1	11.6	53.9	0.100
P6KE43	43	38.7	47.3	1	34.8	1	10.0	61.9	0.101
P6KE43A	43	40.9	45.2	1	36.8	1	10.6	59.3	0.101
P6KE47	47	42.3	51.7	1	38.1	1	9.2	67.8	0.101
P6KE47A	47	44.7	49.4	1	40.2	1	9.7	64.8	0.101
P6KE51	51	45.9	56.1	1	41.3	1	8.5	73.5	0.102
P6KE51A	51	48.5	53.6	1	43.6	1	8.9	70.1	0.102
P6KE56	56	50.4	61.6	1	45.4	1	7.8	80.5	0.103
P6KE56A	56	53.2	58.8	1	47.8	1	8.1	77.0	0.103
P6KE62	62	55.8	68.2	1	50.2	1	7.0	89.0	0.104
P6KE62A	62	58.9	65.1	1	53.0	1	7.4	85.0	0.104
P6KE68	68	61.2	74.8	1	55.1	1	6.4	98.0	0.104

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

Part Number	Nominal Voltage (V)	Breakdown Voltage V_{BR} (V)		Test Current I_T (mA)	Stand-Off Voltage V_{WM} (V)	Maximum Reverse Leakage I_D@ V_{WM} (μA)	Maximum Peak Surge Current I_{PP} (A)	Maximum Clamping Voltage V_C@ I_{PPM} (V)	Maximum Temperature Coefficient of V_{BR} (%/°C)
		Min	Max						
P6KE68A	68	64.6	71.4	1	58.1	1	6.8	92.0	0.104
P6KE75	75	67.5	82.5	1	60.7	1	5.8	108	0.105
P6KE75A	75	71.3	78.8	1	64.1	1	6.1	103	0.105
P6KE82	82	73.8	90.2	1	66.4	1	5.3	118	0.105
P6KE82A	82	77.9	86.1	1	70.1	1	5.5	113	0.105
P6KE91	91	81.9	100	1	73.7	1	4.8	131	0.106
P6KE91A	91	86.5	95.5	1	77.8	1	5.0	125	0.106
P6KE100	100	90	110	1	81.0	1	4.3	144	0.106
P6KE100A	100	95	105	1	85.5	1	4.5	137	0.106
P6KE110	110	99	121	1	89.2	1	3.9	158	0.107
P6KE110A	110	105	116	1	94.0	1	4.1	152	0.107
P6KE120	120	108	132	1	97.2	1	3.6	173	0.107
P6KE120A	120	114	126	1	102	1	3.8	165	0.107
P6KE130	130	117	143	1	105	1	3.3	187	0.107
P6KE130A	130	124	137	1	111	1	3.5	179	0.107
P6KE150	150	135	165	1	121	1	2.9	215	0.108
P6KE150A	150	143	158	1	128	1	3.0	207	0.108
P6KE160	160	144	176	1	130	1	2.7	230	0.108
P6KE160A	160	152	168	1	136	1	2.8	219	0.108
P6KE170	170	153	187	1	138	1	2.5	244	0.108
P6KE170A	170	162	179	1	145	1	2.6	234	0.108
P6KE180	180	162	198	1	146	1	2.4	258	0.108
P6KE180A	180	171	189	1	154	1	2.5	246	0.108
P6KE200	200	180	220	1	162	1	2.1	287	0.108
P6KE200A	200	190	210	1	171	1	2.2	274	0.108
P6KE220	220	198	242	1	175	1	1.8	344	0.108
P6KE220A	220	209	231	1	185	1	1.9	328	0.108
P6KE250	250	225	275	1	202	1	1.7	360	0.110
P6KE250A	250	237	263	1	214	1	1.8	344	0.110
P6KE300	300	270	330	1	243	1	1.4	430	0.110
P6KE300A	300	285	315	1	256	1	1.5	414	0.110
P6KE350	350	315	385	1	284	1	1.2	504	0.110
P6KE350A	350	332	368	1	300	1	1.3	482	0.110
P6KE400	400	360	440	1	324	1	1.0	574	0.110
P6KE400A	400	380	420	1	342	1	1.1	548	0.110
P6KE440	440	396	484	1	356	1	1.0	631	0.110
P6KE440A	440	418	462	1	376	1	1.04	602	0.110

Notes:

1. V_{BR} measure after I_T applied for 300μs, I_T = square wave pulse or equivalent.
2. Surge current waveform per Fig.3 and derate per Fig.2
3. For bipolar types having V_{WM} of 10 volts and under, the I_D limit is doubled.
4. All terms and symbols are consistent with ANSI/IEEE C62.35

ORDERING INFORMATION		
ORDERING CODE[1][2]	**PACKAGE**	**PACKING**
P6KEx	DO-204AC (DO-15)	3,500 / Tape & Reel
P6KEx A0G	DO-204AC (DO-15)	1,500 / Ammo box
P6KExH	DO-204AC (DO-15)	3,500 / Tape & Reel
P6KExHA0G	DO-204AC (DO-15)	1,500 / Ammo box

Notes:

1. "x" defines voltage from 6.8V(P6KE6.8) to 440V(P6KE440)
2. "H" means AEC-Q101 qualified (excluding P6KE6V8A - P6KE9V1A product)

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Peak Pulse Power Rating Curve

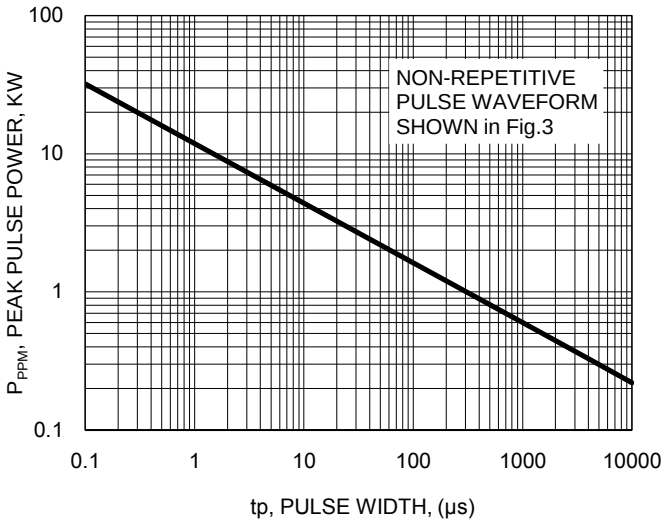


Fig.2 Pulse Derating Curve

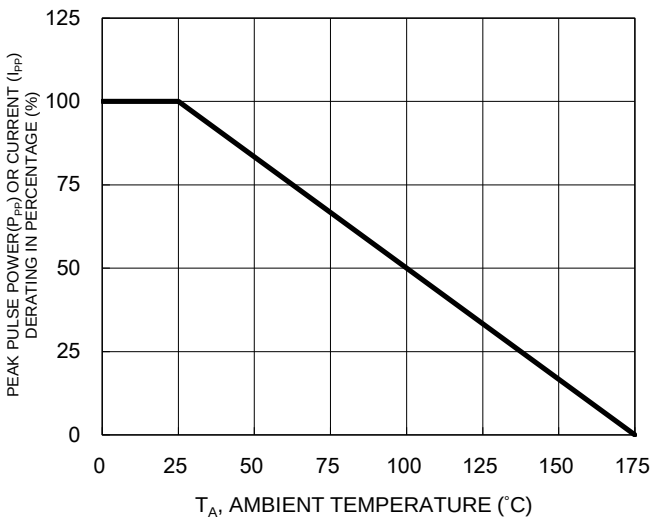


Fig.3 Clamping Power Pulse Waveform

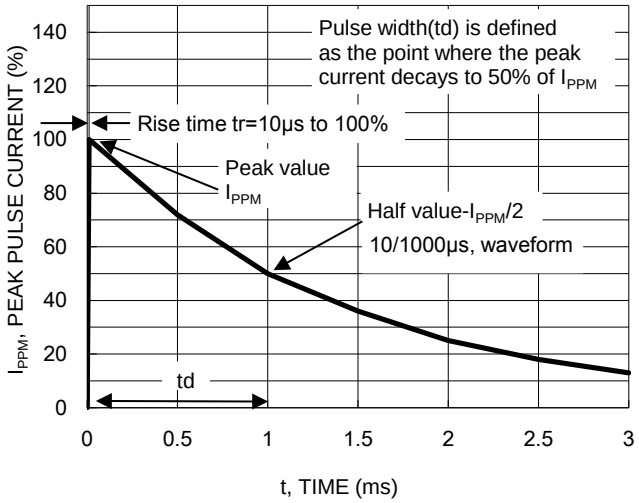
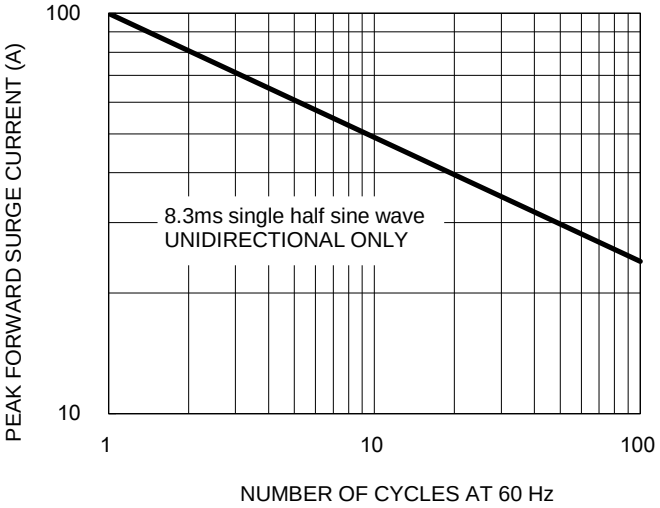


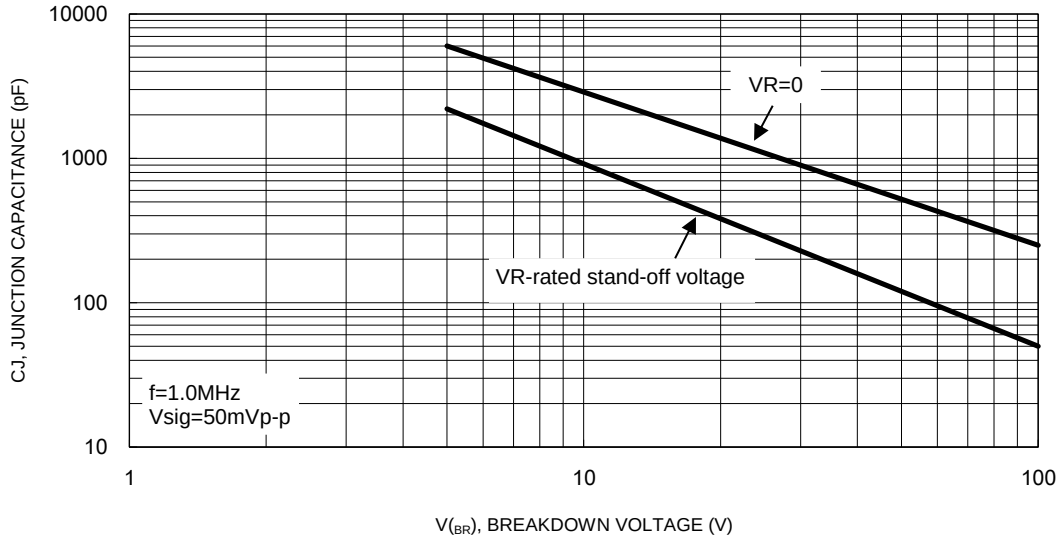
Fig.4 Maximum Non-Repetitive Forward Surge Current



CHARACTERISTICS CURVES

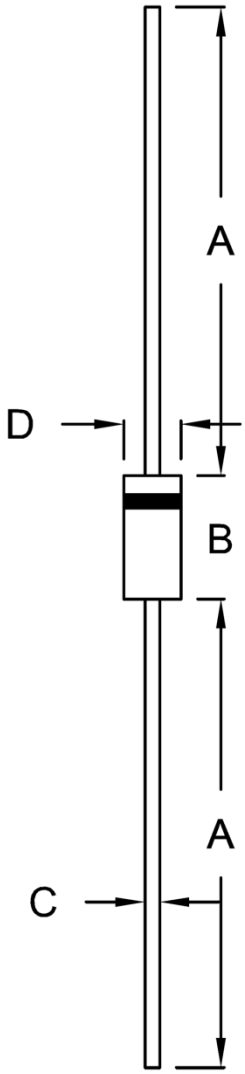
(T_A = 25°C unless otherwise noted)

Fig.5 Typical Junction Capacitance



PACKAGE OUTLINE DIMENSIONS

DO-204AC (DO-15)



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	25.40	-	1.000	-
B	5.80	7.60	0.228	0.299
C	0.70	0.90	0.028	0.035
D	2.60	3.60	0.102	0.142

MARKING DIAGRAM

Cathode band for uni-directional products only

P/N = Marking Code
G = Green Compound
YWW = Date Code
F = Factory Code