

Transient Voltage Suppressors (TVS) Data Sheet

Description

The 1.5KE series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events

Features

- Low leakage
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 1500W peak pulse power capability at 10/1000μs waveform
- Fast response time
- Typical IR less than 1μA above 12V
- High Temperature soldering: 260°C /10 seconds at terminals
- Typical maximum temperature coefficient $\Delta V_{BR} = 0.1\% \times V_{BR}@25^{\circ}\text{C} \times \Delta T$
- Plastic package has Underwriters Laboratory Flammability 94V-0
- Matte tin lead-free Plated
- Typical failure mode is short from over-specified voltage or current
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- IEC 61000-4-2 ESD 30KV(Air),30KV(contact)

Applications

TVS devices are ideal for the protection of I/O interfaces, VCC bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications

Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	VALUE	SYMBOL
Peak Pulse Power Dissipation with a 10/1000μs waveform (Fig.1)(Note 1), (Note 2)	P_{PPM}	1500	W
Peak Pulse Current with a 10/1000μs waveform.(Note1, Fig.3)	I_{PP}	See Next Table	A
Power Dissipation on Infinite Heat Sink at TL=75° C	$P_{M(AV)}$	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	I_{FSM}	200	A
Maximum Instantaneous Forward Voltage at 25A for Unidirectional Only(Note 4)	V_F	3.5/5.0	V
Operating junction and Storage Temperature Range	T_J, T_{STG}	-55 to +175	°C

Note :

(1) Non-repetitive current pulse, per Fig. 3 and derated above Ta = 25°C per Fig. 2.

(2) Mounted on 5.0mm x 5.0mm (0.03mm thick) Copper Pads to each terminal.

(3) 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

(4) $V_F < 3.5V$ for $V_{BR} < 220V$ and $V_F < 5.0V$ for $V_{BR} > 220V$.

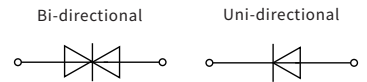
Breakdown Voltage

6.8 to 5450 V

Peak Pulse Power

1500 W

DO-27



● Electrical Characteristics (Ta=25°C Unless otherwise specified)

Part Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage V _{BR} (V) @I _T		Test Current	Maximum Clamping Voltage@I _{PP}	Peak Pulse Current	Reverse Leakage @V _{RWM}
Uni	Bi	Uni	Bi	V _{RWM} (V)	Min.	Max.	I _T (mA)	V _C (V)	I _{PP} (A)	I _R (μA)
1.5KE6.8	1.5KE6.8C	1.5KE6.8	1.5KE6.8C	5.50	6.12	7.48	10	10.8	139	1000
1.5KE6.8A	1.5KE6.8CA	1.5KE6.8A	1.5KE6.8CA	5.80	6.45	7.14	10	10.5	143	1000
1.5KE7.5	1.5KE7.5C	1.5KE7.5	1.5KE7.5C	6.05	6.75	8.25	10	11.7	128	500
1.5KE7.5A	1.5KE7.5CA	1.5KE7.5A	1.5KE7.5CA	6.40	7.13	7.88	10	11.3	133	500
1.5KE8.2	1.5KE8.2C	1.5KE8.2	1.5KE8.2C	6.63	7.38	9.02	10	12.5	120	200
1.5KE8.2A	1.5KE8.2CA	1.5KE8.2A	1.5KE8.2CA	7.02	7.79	8.61	10	12.1	124	200
1.5KE9.1	1.5KE9.1C	1.5KE9.1	1.5KE9.1C	7.37	8.19	10.0	1.0	13.8	109	50
1.5KE9.1A	1.5KE9.1CA	1.5KE9.1A	1.5KE9.1CA	7.78	8.65	9.55	1.0	13.4	112	50
1.5KE10	1.5KE10C	1.5KE10	1.5KE10C	8.10	9.00	11.0	1.0	15.0	100	10
1.5KE10A	1.5KE10CA	1.5KE10A	1.5KE10CA	8.55	9.50	10.5	1.0	14.5	103	10
1.5KE11	1.5KE11C	1.5KE11	1.5KE11C	8.92	9.90	12.1	1.0	16.2	92.6	5.0
1.5KE11A	1.5KE11CA	1.5KE11A	1.5KE11CA	9.40	10.5	11.6	1.0	15.6	96.2	5.0
1.5KE12	1.5KE12C	1.5KE12	1.5KE12C	9.72	10.8	13.2	1.0	17.3	86.7	5.0
1.5KE12A	1.5KE12CA	1.5KE12A	1.5KE12CA	10.2	11.4	12.6	1.0	16.7	89.8	5.0
1.5KE13	1.5KE13C	1.5KE13	1.5KE13C	10.5	11.7	14.3	1.0	19.0	78.9	5.0
1.5KE13A	1.5KE13CA	1.5KE13A	1.5KE13CA	11.1	12.4	13.7	1.0	18.2	82.4	5.0
1.5KE15	1.5KE15C	1.5KE15	1.5KE15C	12.1	13.5	16.5	1.0	22.0	68.2	1.0
1.5KE15A	1.5KE15CA	1.5KE15A	1.5KE15CA	12.8	14.3	15.8	1.0	21.2	70.8	1.0
1.5KE16	1.5KE16C	1.5KE16	1.5KE16C	12.9	14.4	17.6	1.0	23.5	63.8	1.0
1.5KE16A	1.5KE16CA	1.5KE16A	1.5KE16CA	13.6	15.2	16.8	1.0	22.5	66.7	1.0
1.5KE18	1.5KE18C	1.5KE18	1.5KE18C	14.5	16.2	19.8	1.0	26.5	56.6	1.0
1.5KE18A	1.5KE18CA	1.5KE18A	1.5KE18CA	15.3	17.1	18.9	1.0	25.2	59.5	1.0
1.5KE20	1.5KE20C	1.5KE20	1.5KE20C	16.2	18.0	22.0	1.0	29.1	51.5	1.0
1.5KE20A	1.5KE20CA	1.5KE20A	1.5KE20CA	17.1	19.0	21.0	1.0	27.7	54.2	1.0
1.5KE22	1.5KE22C	1.5KE22	1.5KE22C	17.8	19.8	24.2	1.0	31.9	47.0	1.0
1.5KE22A	1.5KE22CA	1.5KE22A	1.5KE22CA	18.8	20.9	23.1	1.0	30.6	49.0	1.0
1.5KE24	1.5KE24C	1.5KE24	1.5KE24C	19.4	21.6	26.4	1.0	34.7	43.2	1.0
1.5KE24A	1.5KE24CA	1.5KE24A	1.5KE24CA	20.5	22.8	25.2	1.0	33.2	45.2	1.0
1.5KE27	1.5KE27C	1.5KE27	1.5KE27C	21.8	24.3	29.7	1.0	39.1	38.4	1.0
1.5KE27A	1.5KE27CA	1.5KE27A	1.5KE27CA	23.1	25.7	28.4	1.0	37.5	40.0	1.0
1.5KE30	1.5KE30C	1.5KE30	1.5KE30C	24.3	27.0	33.0	1.0	43.5	34.5	1.0
1.5KE30A	1.5KE30CA	1.5KE30A	1.5KE30CA	25.6	28.5	31.5	1.0	41.4	36.2	1.0
1.5KE33	1.5KE33C	1.5KE33	1.5KE33C	26.8	29.7	36.3	1.0	47.7	31.4	1.0
1.5KE33A	1.5KE33CA	1.5KE33A	1.5KE33CA	28.2	31.4	34.7	1.0	45.7	32.8	1.0
1.5KE36	1.5KE36C	1.5KE36	1.5KE36C	29.1	32.4	39.6	1.0	52.0	28.8	1.0
1.5KE36A	1.5KE36CA	1.5KE36A	1.5KE36CA	30.8	34.2	37.8	1.0	49.9	30.1	1.0

1.5KE SERIES

1500W AXIAL TRANSIENT VOLTAGE SUPPRESSORS

● Electrical Characteristics (Ta=25°C Unless otherwise specified)

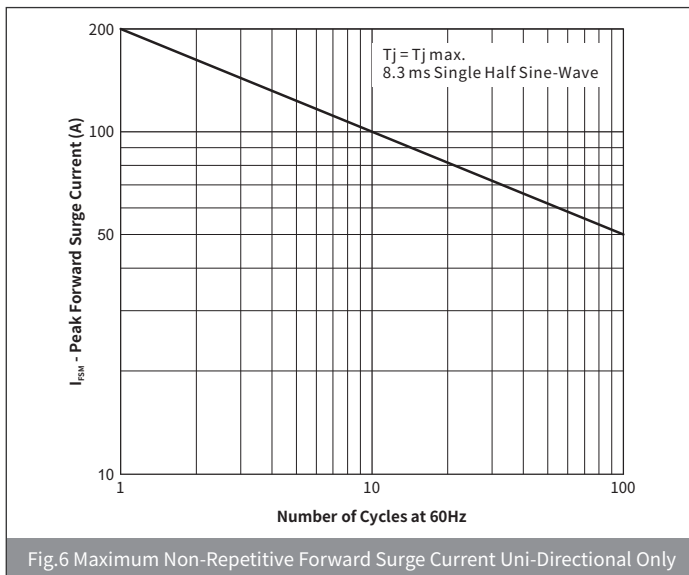
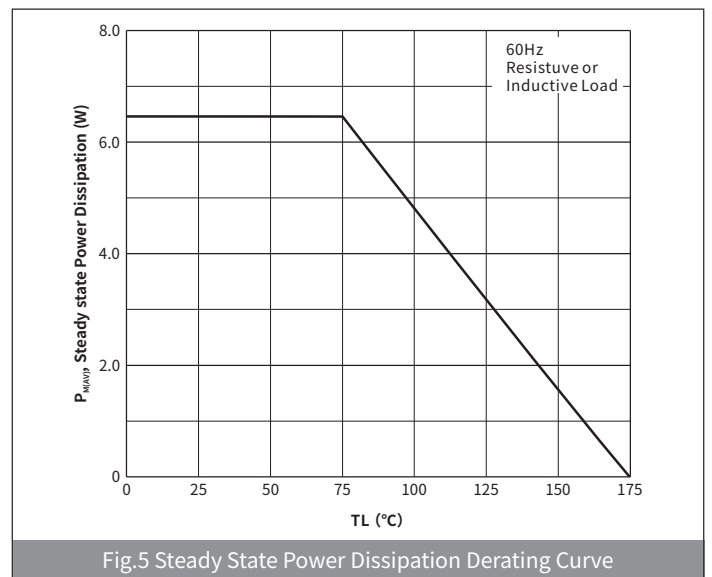
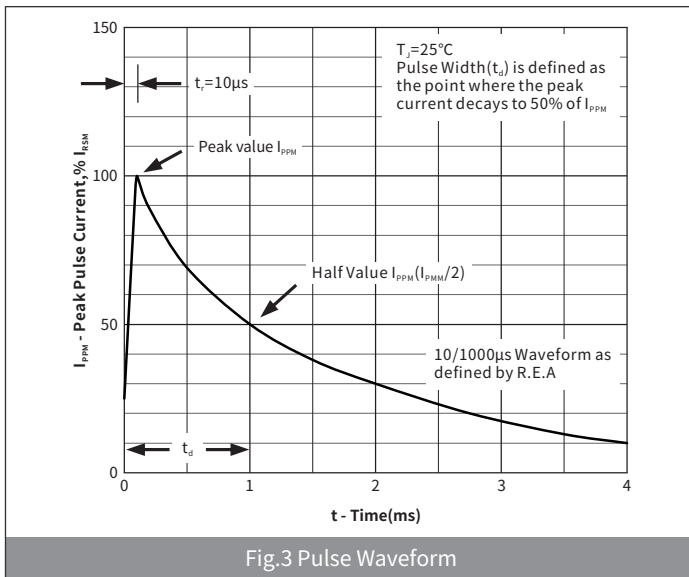
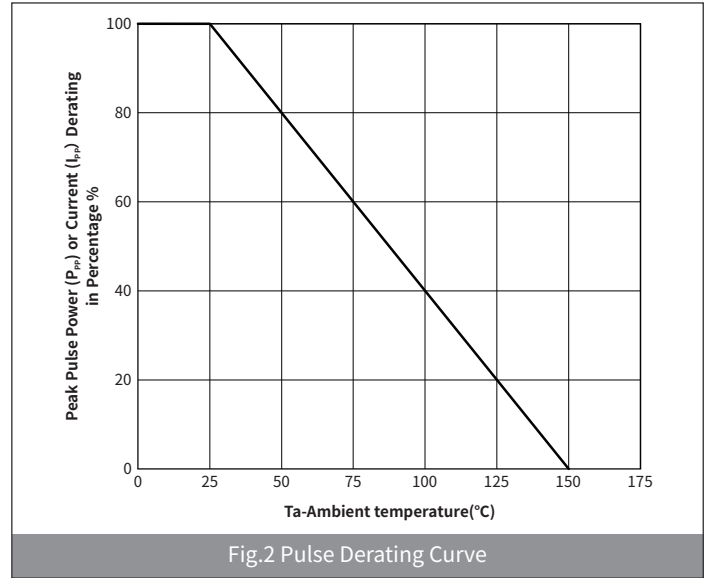
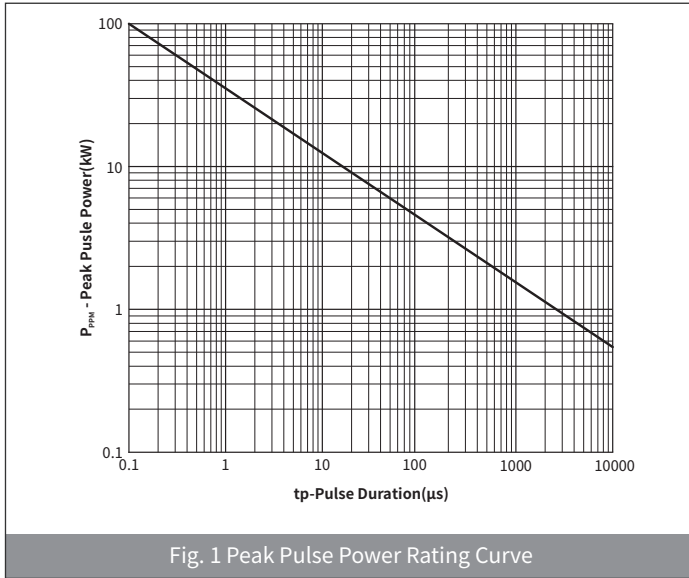
Part Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage V_{BR} (V) @ I_T		Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RWM}
Uni	Bi	Uni	Bi	V_{RWM} (V)	Min.	Max.	I_T (mA)	V_C (V)	I_{PP} (A)	I_R (μA)
1.5KE39	1.5KE39C	1.5KE39	1.5KE39C	31.6	35.1	42.9	1.0	56.4	26.6	1.0
1.5KE39A	1.5KE39CA	1.5KE39A	1.5KE39CA	33.3	37.1	41.0	1.0	53.9	27.8	1.0
1.5KE43	1.5KE43C	1.5KE43	1.5KE43C	34.8	38.7	47.3	1.0	61.9	24.2	1.0
1.5KE43A	1.5KE43CA	1.5KE43A	1.5KE43CA	36.8	40.9	45.2	1.0	59.3	25.3	1.0
1.5KE47	1.5KE47C	1.5KE47	1.5KE47C	38.1	42.3	51.7	1.0	67.8	22.1	1.0
1.5KE47A	1.5KE47CA	1.5KE47A	1.5KE47CA	40.2	44.7	49.4	1.0	64.8	23.1	1.0
1.5KE51	1.5KE51C	1.5KE51	1.5KE51C	41.3	45.9	56.1	1.0	73.5	20.4	1.0
1.5KE51A	1.5KE51CA	1.5KE51A	1.5KE51CA	43.6	48.5	53.6	1.0	70.1	21.4	1.0
1.5KE56	1.5KE56C	1.5KE56	1.5KE56C	45.4	50.4	61.8	1.0	80.5	18.6	1.0
1.5KE56A	1.5KE56CA	1.5KE56A	1.5KE56CA	47.8	53.2	58.8	1.0	77.0	19.5	1.0
1.5KE62	1.5KE62C	1.5KE62	1.5KE62C	50.2	55.8	68.2	1.0	89.0	16.9	1.0
1.5KE62A	1.5KE62CA	1.5KE62A	1.5KE62CA	53.0	58.9	65.1	1.0	85.0	17.6	1.0
1.5KE68	1.5KE68C	1.5KE68	1.5KE68C	55.1	61.2	74.8	1.0	98.0	15.3	1.0
1.5KE68A	1.5KE68CA	1.5KE68A	1.5KE68CA	58.1	64.6	71.4	1.0	92.0	16.3	1.0
1.5KE75	1.5KE75C	1.5KE75	1.5KE75C	60.7	67.5	82.5	1.0	109	13.9	1.0
1.5KE75A	1.5KE75CA	1.5KE75A	1.5KE75CA	64.1	71.3	78.8	1.0	104	14.6	1.0
1.5KE82	1.5KE82C	1.5KE82	1.5KE82C	66.4	73.8	90.2	1.0	118	12.7	1.0
1.5KE82A	1.5KE82CA	1.5KE82A	1.5KE82CA	70.1	77.9	86.1	1.0	113	13.3	1.0
1.5KE91	1.5KE91C	1.5KE91	1.5KE91C	73.7	81.9	100.0	1.0	131	11.5	1.0
1.5KE91A	1.5KE91CA	1.5KE91A	1.5KE91CA	77.8	86.5	95.5	1.0	125	12.0	1.0
1.5KE100	1.5KE100C	1.5KE100	1.5KE100C	81.0	90.0	110	1.0	144	10.4	1.0
1.5KE100A	1.5KE100CA	1.5KE100A	1.5KE100CA	85.5	95.0	105	1.0	137	10.9	1.0
1.5KE110	1.5KE110C	1.5KE110	1.5KE110C	89.2	99.0	121	1.0	158	9.5	1.0
1.5KE110A	1.5KE110CA	1.5KE110A	1.5KE110CA	94.0	105	116	1.0	152	9.9	1.0
1.5KE120	1.5KE120C	1.5KE120	1.5KE120C	97.2	108	132	1.0	173	8.7	1.0
1.5KE120A	1.5KE120CA	1.5KE120A	1.5KE120CA	102	114	126	1.0	165	9.1	1.0
1.5KE130	1.5KE130C	1.5KE130	1.5KE130C	105	117	143	1.0	187	8.0	1.0
1.5KE130	1.5KE130CA	1.5KE130	1.5KE130CA	111	124	137	1.0	179	8.4	1.0
1.5KE150	1.5KE150C	1.5KE150	1.5KE150C	121	136	165	1.0	215	7.0	1.0
1.5KE150A	1.5KE150CA	1.5KE150A	1.5KE150CA	128	143	158	1.0	207	7.2	1.0
1.5KE160	1.5KE160C	1.5KE160	1.5KE160C	130	144	176	1.0	230	6.5	1.0
1.5KE160A	1.5KE160CA	1.5KE160A	1.5KE160CA	136	152	168	1.0	219	6.8	1.0
1.5KE170	1.5KE170C	1.5KE170	1.5KE170C	138	153	187	1.0	244	6.1	1.0
1.5KE170A	1.5KE170CA	1.5KE170A	1.5KE170CA	145	162	179	1.0	234	6.4	1.0
1.5KE180	1.5KE180C	1.5KE180	1.5KE180C	146	162	198	1.0	258	5.8	1.0
1.5KE180A	1.5KE180CA	1.5KE180A	1.5KE180CA	154	171	189	1.0	246	6.1	1.0

● Electrical Characteristics (Ta=25°C Unless otherwise specified)

Part Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage V _{BR} (V) @I _T		Test Current	Maximum Clamping Voltage@I _{PP}	Peak Pulse Current	Reverse Leakage @V _{RWM}
Uni	Bi	Uni	Bi	V _{RWM} (V)	Min.	Max.	I _T (mA)	V _C (V)	I _{PP} (A)	I _R (μA)
1.5KE200	1.5KE200C	1.5KE200	1.5KE200C	162	180	220	1.0	287	5.2	1.0
1.5KE200A	1.5KE200CA	1.5KE200A	1.5KE200CA	171	190	210	1.0	274	5.5	1.0
1.5KE220	1.5KE220C	1.5KE220	1.5KE220C	175	198	242	1.0	344	4.4	1.0
1.5KE220A	1.5KE220CA	1.5KE220A	1.5KE220CA	185	209	231	1.0	328	4.6	1.0
1.5KE250	1.5KE250C	1.5KE250	1.5KE250C	202	225	275	1.0	360	4.2	1.0
1.5KE250A	1.5KE250CA	1.5KE250A	1.5KE250CA	214	237	263	1.0	344	4.4	1.0
1.5KE300	1.5KE300C	1.5KE300	1.5KE300C	243	270	330	1.0	430	3.5	1.0
1.5KE300A	1.5KE300CA	1.5KE300A	1.5KE300CA	256	285	315	1.0	414	3.6	1.0
1.5KE350	1.5KE350C	1.5KE350	1.5KE350C	284	315	385	1.0	504	3.0	1.0
1.5KE350A	1.5KE350CA	1.5KE350A	1.5KE350CA	300	333	368	1.0	482	3.1	1.0
1.5KE400	1.5KE400C	1.5KE400	1.5KE400C	324	360	440	1.0	574	2.6	1.0
1.5KE400A	1.5KE400CA	1.5KE400A	1.5KE400CA	342	380	420	1.0	548	2.7	1.0
1.5KE440	1.5KE440C	1.5KE440	1.5KE440C	356	396	484	1.0	631	2.4	1.0
1.5KE440A	1.5KE440CA	1.5KE440A	1.5KE440CA	376	418	462	1.0	602	2.5	1.0
1.5KE480	1.5KE480C	1.5KE480	1.5KE480C	389	432	528	1.0	686	2.19	1.0
1.5KE480A	1.5KE480CA	1.5KE480A	1.5KE480CA	408	456	504	1.0	658	2.28	1.0
1.5KE510	1.5KE510C	1.5KE510	1.5KE510C	413	459	561	1.0	729	2.06	1.0
1.5KE510A	1.5KE510CA	1.5KE510A	1.5KE510CA	434	485	535	1.0	698	2.15	1.0
1.5KE540	1.5KE540C	1.5KE540	1.5KE540C	437	486	594	1.0	772	1.94	1.0
1.5KE540A	1.5KE540CA	1.5KE540A	1.5KE540CA	459	513	567	1.0	740	2.03	1.0

Note :
(1)Suffix 'A ' denotes 5% tolerance device.
(2)Add suffix ' CA ' after part number to specify Bi-directional devices.
(3)For Bi-Directional devices having VR of 10 volts and under, the IR limit is double.

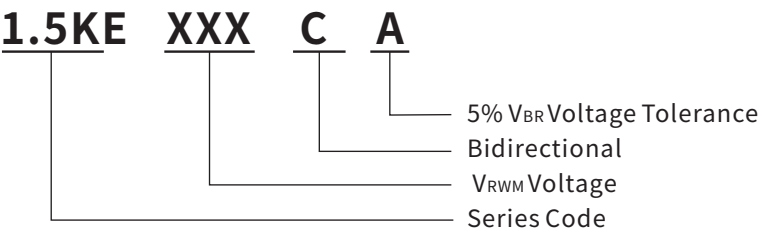
● Ratings And Characteristics Curves ($T_a=25^\circ\text{C}$ Unless otherwise specified)



1.5KE SERIES

1500W AXIAL TRANSIENT VOLTAGE SUPPRESSORS

Part Numbering



Ordering Information

PACKAGE	UNIT WEIGHT(g)	BOX(pcs)	CARTON(pcs)
DO-27	0.954	1200	12000

Package Outline Dimensions (DO-27)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	7.200	9.500	0.285	0.375
B	4.800	5.300	0.880	0.210
C	24.500	-	0.960	-
e	1.100	1.300	0.039	0.052