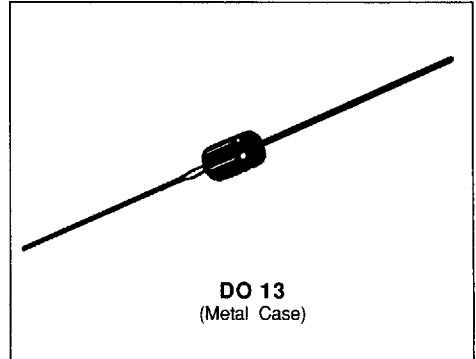


TRANSIL

FEATURES

- PEAK PULSE POWER= 1500 W @ 1ms.
- BREAKDOWN VOLTAGE RANGE :
From 11V to 200 V.
- UNI AND BIDIRECTIONAL TYPES.
- LOW CLAMPING FACTOR.
- FAST RESPONSE TIME:
Tclamping : 1 ps (0 V to VBR).



DESCRIPTION

Transil diodes provide high overvoltage protection by clamping action. Their instantaneous response to transients makes them particularly suited to protect voltage sensitive devices such as MOS Technology and low voltage supplied IC's.

MECHANICAL CHARACTERISTICS

- Body marked with : Logo, Date Code, Type Code and Cathode Band (for unidirectional types only).
- Tinned copper leads.
- High temperature soldering.

ABSOLUTE RATINGS (limiting values).

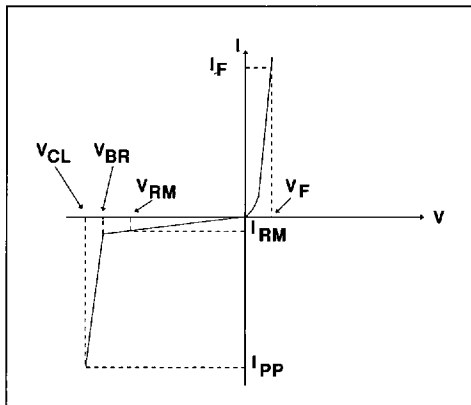
Symbol	Parameter		Value	Unit
P_p	Peak pulse power dissipation See note 1 and derating curve Fig 1.	$T_{amb} = 25^\circ\text{C}$	1500	W
P	Power dissipation on infinite heatsink See note 1 and derating curve Fig 1.	$T_{lead} = 75^\circ\text{C}$	5	W
I_{FSM}	Non repetitive surge peak forward current For Unidirectional types	$T_{amb} = 25^\circ\text{C}$ $t = 10 \text{ ms}$	250	A
T_{stg} T_j	Storage and junction temperature range		- 65 to + 175 175	$^\circ\text{C}$ $^\circ\text{C}$
T_L	Maximum lead temperature for soldering during 10 s.		230	$^\circ\text{C}$

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction-leads on infinite heatsink	20	°C/W
$R_{th(j-a)}$	Junction to ambient. on printed circuit. $L_{lead} = 10\text{ mm}$	75	°C/W

ELECTRICAL CHARACTERISTICS

Symbol	Parameter
V_{RM}	Stand-off voltage.
V_{BR}	Breakdown voltage.
V_{CL}	Clamping voltage.
I_{RM}	Leakage current @ V_{RM} .
I_{PP}	Surge current.
α_T	Voltage temperature coefficient.
V_F	Forward Voltage drop $V_F < 3.5V @ I_F = 100\text{ A}$.

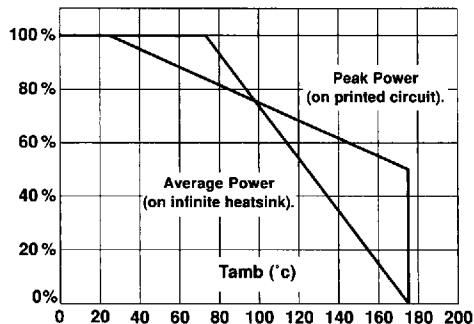
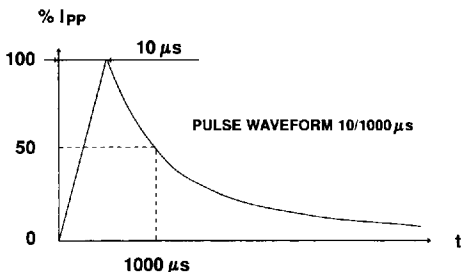


TYPES		$I_{RM} @ V_{RM}$		$V_{BR} @ I_R$				$V_{CL} @ I_{PP}$		$V_{CL} @ I_{PP}$		α_T	C
		max		min nom max				max		max		max	typ
				note2				10/1000 μ s		8/20 μ s		note3	note4
Unidirectional	Bidirectional	μ A	V	V	V	V	mA	V	A	V	A	10 ⁻⁴ /°C	(pF)
1N5634 A	1N6040 A	5	9.4	10.5	11	11.6	1	15.6	96	20.3	493	7.5	6400
1N5635 A	1N6041 A	5	10.2	11.4	12	12.6	1	16.7	90	21.7	461	7.8	6000
1N5636 A	1N6042 A	5	11.1	12.4	13	13.7	1	18.2	82	23.6	423	8.1	5500
1N5637 A	1N6043 A	5	12.8	14.3	15	15.8	1	21.2	71	27.2	368	8.4	5000
1N5638 A	1N6044 A	5	13.6	15.2	16	16.8	1	22.5	67	28.9	346	8.6	4700
1N5639 A	1N6045 A	5	15.3	17.1	18	18.9	1	25.2	59.5	32.5	308	8.8	4300
1N5640 A	1N6046 A	5	17.1	19	20	21	1	27.7	54	36.1	277	9.0	4000
1N5641 A	1N6047 A	5	18.8	20.9	22	23.1	1	30.6	49	39.3	254	9.2	3700
1N5642 A	1N6048 A	5	20.5	22.8	24	25.2	1	33.2	45	42.8	234	9.4	3500
1N5643 A	1N6049 A	5	23.1	25.7	27	28.4	1	37.5	40	48.3	207	9.6	3200
1N5644 A	1N6050 A	5	25.6	28.5	30	31.5	1	41.5	36	53.5	187	9.7	2900
1N5645 A	1N6051 A	5	28.2	31.4	33	34.7	1	45.7	33	59.0	169	9.8	2700
1N5646 A	1N6052 A	5	30.8	34.2	36	37.8	1	49.9	30	64.3	156	9.9	2500
1N5647 A	1N6053 A	5	33.3	37.1	39	41.0	1	53.9	28	69.7	143	10.0	2400
1N5648 A	1N6054 A	5	36.8	40.9	43	45.2	1	59.3	25.3	76.8	130	10.1	2200
1N5649 A	1N6055 A	5	40.2	44.7	47	49.4	1	64.8	23.2	84	119	10.1	2050
1N5650 A	1N6056 A	5	43.6	48.5	51	53.6	1	70.1	21.4	91	110	10.2	1950
1N5651 A	1N6057 A	5	47.8	53.2	56	58.8	1	77	19.5	100	100	10.3	1800
1N5652 A	1N6058 A	5	53.0	58.9	62	65.1	1	85	17.7	111	90	10.4	1700
1N5653 A	1N6059 A	5	58.1	64.6	68	71.4	1	92	16.3	121	83	10.4	1550
1N5654 A	1N6060 A	5	64.1	71.3	75	78.8	1	103	14.6	134	75	10.5	1450
1N5655 A	1N6061 A	5	70.1	77.9	82	86.1	1	113	13.3	146	69	10.5	1350
1N5656 A	1N6062 A	5	77.8	86.5	91	95.5	1	125	12	162	62	10.6	1250
1N5657 A	1N6063 A	5	85.5	95.0	100	105	1	137	11	178	56	10.6	1150
1N5658 A	1N6064 A	5	94.0	105	110	116	1	152	9.9	195	51	10.7	1050

TYPES		IRM @ VRM		VBR @ IR				VCL @ Ipp		VCL @ Ipp		αT	C
		max		min	nom	max		max		max		max	typ
				note2				10/1000μs		8/20μs		note3	note4
Unidirectional	Bidirectional	μA	V	V	V	V	mA	V	A	V	A	10 ⁻⁴ /°C	(pF)
1N5659 A	1N6065 A	5	102	114	120	126	1	65	9.1	212	47	10.7	1000
1N5660 A	1N6066 A	5	111	124	130	137	1	179	8.4	230	43	10.7	950
1N5661 A	1N6067 A	5	128	143	150	158	1	207	7.2	265	38	10.8	850
1N5662 A	1N6068 A	5	136	152	160	168	1	219	6.8	282	35	10.8	800
1N5663 A	1N6069 A	5	145	161	170	179	1	234	6.4	301	33	10.8	750
1N5664 A	1N6070 A	5	154	171	180	189	1	246	6.1	317	31.5	10.8	725
1N5665 A	1N6071 A	5	171	190	200	210	1	274	5.5	353	28	10.8	675
	1N6072 A	5	188	209	220	231	1	328	4.6	388	26	10.8	625

All parameters tested at 25 °C, except where indicated.

Figure 1: Power dissipation derating versus ambient temperature.



Note 1 : For surges greater than the maximum values, the diode will present a short-circuit Anode - Cathode

Note 2 : Pulse test: $T_P < 50$ ms.

Note 3 : $\Delta V_{BR} = \alpha T \cdot (T_a - 25) \cdot V_{BR(25^\circ C)}$.

Note 4 : $V_R = 0$ V, $F = 1$ MHz. For bidirectional types, capacitance value is divided by 2

Figure 2 : Peak pulse power versus exponential pulse duration.

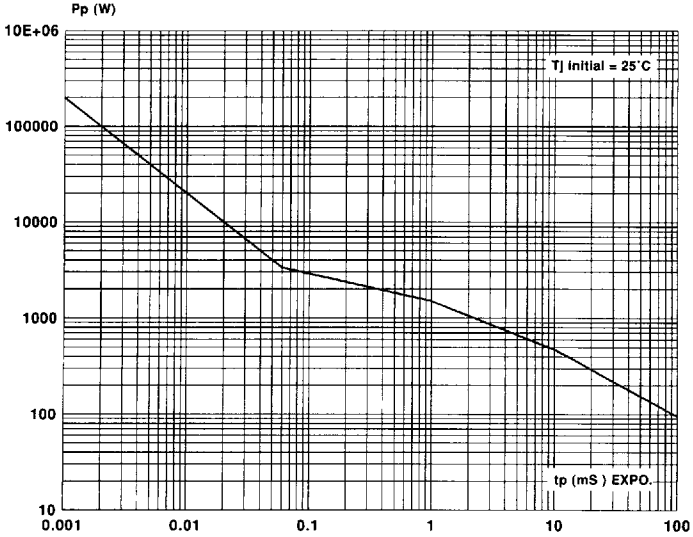
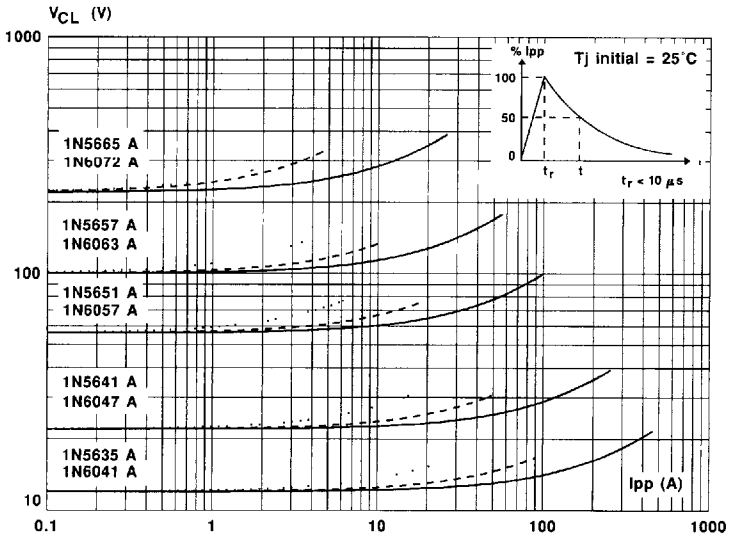


Figure 3 : Clamping voltage versus peak pulse current.

exponential waveform $t = 20 \mu\text{s}$ _____
 $t = 1 \text{ ms}$ - - - - -
 $t = 10 \text{ ms}$
 $t_r < 10 \mu\text{s}$



Note : The curves of the figure 3 are specified for a junction temperature of 25 °C before surge.
 The given results may be extrapolated for other junction temperatures by using the following formula :
 $\Delta V (BR) = \alpha T (V(BR)) \cdot [T_a - 25] \cdot V (BR)$.
 For intermediate voltages, extrapolate the given results.

Figure 4a : Capacitance versus reverse applied voltage for unidirectional types (typical values).

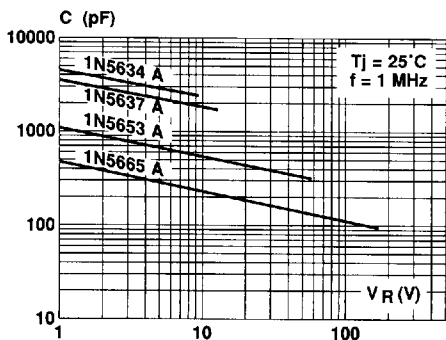


Figure 4b : Capacitance versus reverse applied voltage for bidirectional types (typical values).

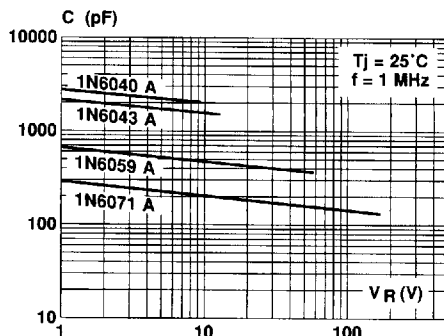


Figure 5 : Peak forward voltage drop versus peak forward current (typical values for unidirectional types).

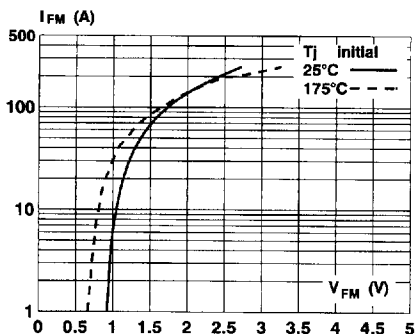
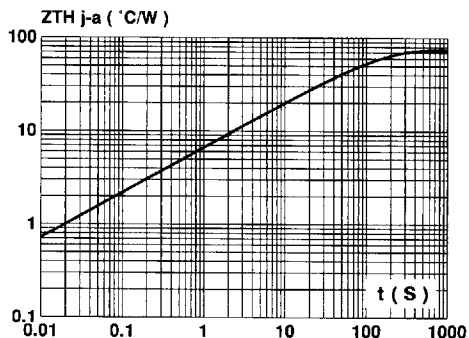


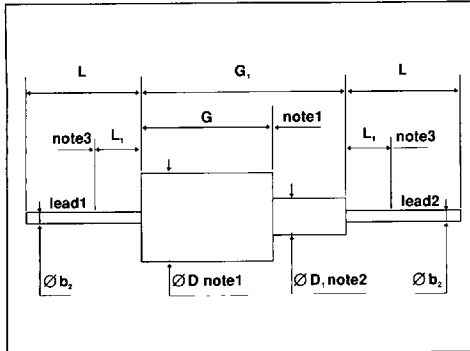
Figure 6 : Transient thermal impedance junction-ambient versus pulse duration. For a mounting on PC Board with $L_{lead} = 10\text{ mm}$.



MARKING : Logo, Date Code, Type Code, Cathode Band (for unidirectional types only).

PACKAGE MECHANICAL DATA

DO 13



Ref	Millimeters		Inches	
	min	max	min	max
Ø b ₂	0.64	0.88	0.025	0.035
Ø D	5.47	5.96	0.215	0.235
Ø D ₁	1.15	2.54	0.045	0.100
G	7.45	9.06	0.293	0.357
G ₁	-	14.47	-	0.570
L	25.4	41.2	1.000	1.625
L ₁	-	4.77	-	0.188

note1: Ø D is substantially constant along the length G.
note2: This dimension limits any pinch or seal deformation along the tabulation
note3: The lead diameter Ø b₂ is not controlled over zone L₁

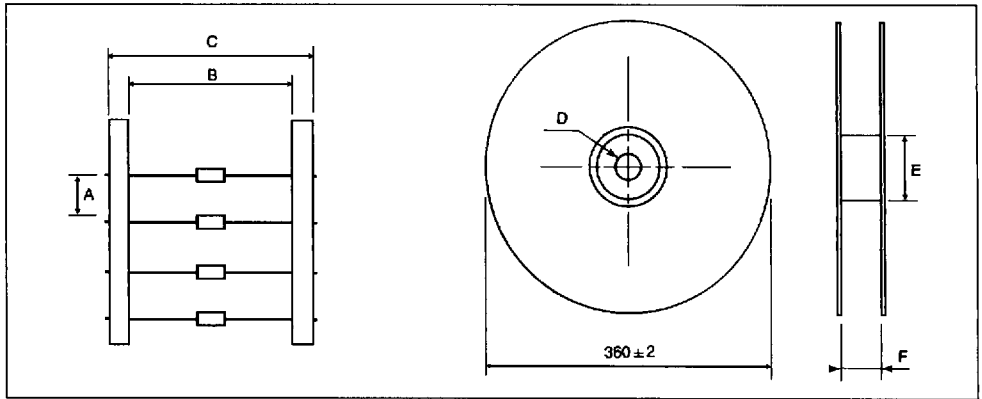
Weight = 1.45 g.

Packaging : standard packaging is in bulk.

TAPE AND REEL PACKAGING

Case	Base QTY	Component Spacing A	Tape Spacing		Reel Dimensions		
			B	C	D	E	F
F126	6000	5 ± 0.5	53 ± 2	65 ± 2	31.5	86	75 min
CB417	5000	5 ± 0.5	53 ± 2	65 ± 2	31.5	86	75 min
CB429	1900	10 ± 0.5	53 ± 2	65 ± 2	31.5	86	75 min
DO13	1000	10 ± 0.5	53 ± 2	65 ± 2	31.5	86	81 min
AG	1000	10 ± 0.5	43 ± 2	55 ± 2	31.5	86	75 min

All dimensions are in millimetres

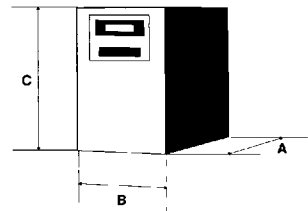


Note : All polarised components are oriented with their cathode tape coloured red and their anode tape white. Unpolarised components have both tapes coloured red.

MATCHBOX PACKAGING

Case	Base QTY	Box Dimensions		
		A	B	C
DO13	100	149	62	80
AG	100	149	62	80

All dimensions are in millimetres

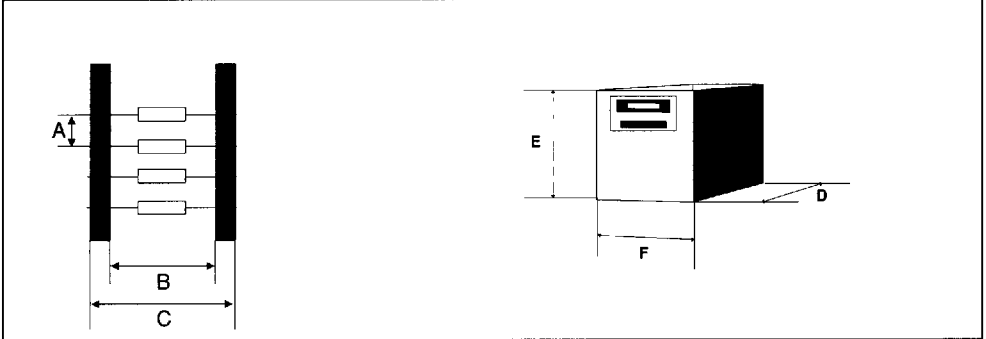


PACKAGING STANDARDS

FAN FOLD BOX PACKAGING

Case	Base QTY	Component Spacing	Tape Spacing		Reel Dimensions		
		A	B	C	D	E	F
F126	1000	5 ± 0.5	53 ± 2	65 ± 2	255	85	82
CB417	1000	5 ± 0.5	53 ± 2	65 ± 2	255	85	82
CB429	600	10 ± 0.5	53 ± 2	65 ± 2	255	85	82

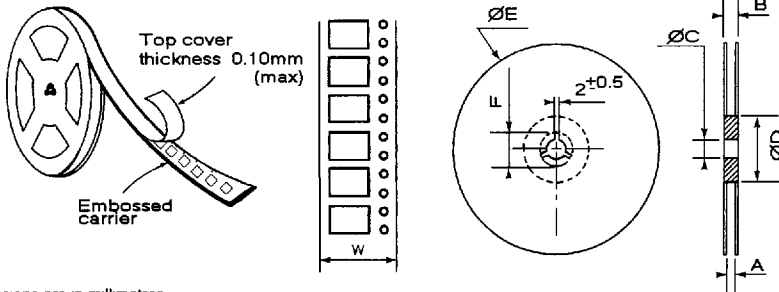
All dimensions are in millimetres



Note : All polarised components are oriented with their cathode tape coloured red and their anode tape white. Unpolarised components have both tapes coloured red

SURFACE MOUNT PACKAGING (FILM AND REEL)

Case	Base QTY	Film Width	Reel Dimensions					
		W	A	B	C	D	E	F
SOD6 ⁽¹⁾	2500	12 ± 0.2	12.4 ± 2	18.4 Max	13	60 ± 2	330	20.2
SOD15 ⁽¹⁾	2500	16 ± 0.2	16.4 ± 2	22.4 Max	13	60 ± 2	330	20.2
SO8	2500	12 ± 0.2	12.4 ± 2	18.4 Max	13	50 Min	330	20.2
SO20	1000	24 ± 0.2	24.4 ± 2	30.4 Max	13	50 Min	330	20.2



All dimensions are in millimetres.

⁽¹⁾ Also known as CB472.

⁽¹⁾ Also known as CB473.

Note : Polarized devices have their cathode lead oriented toward the perforated side of the film

TUBE PACKAGING

Case	Base QTY	Tube Dimensions			
		L	A	B	C
SO8	100	532 ± 1	7.80 ± 0.1	7.80 ± 0.1	3.80 ± 0.1
SO20	40	532 ± 1	15 ± 0.1	15 ± 0.1	4.70 ± 0.1
DIL8	50	532 ± 1	8.40 ± 0.15	15.20 ± 0.25	11.20 ± 0.25
DIL20	20	532 ± 1	8.40 ± 0.15	15.20 ± 0.25	11.20 ± 0.25
SIL3	50	532 ± 1	28.9 ± 0.1	28.9 ± 0.1	5.55 ± 0.1
SIL4	50	532 ± 1	28.9 ± 0.1	28.9 ± 0.1	5.55 ± 0.1
TO220AB	50	532 ± 1	31.4 ± 0.1	31.4 ± 0.1	5.5 ± 0.2

All dimensions are in millimetres

