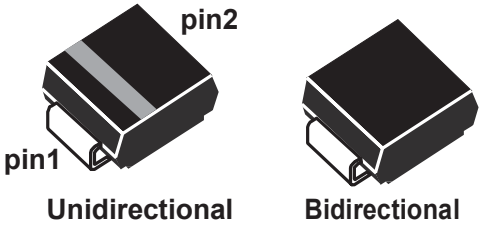
SMC15J

Peak Pulse Power on 10/1000μs 1500 W

Description

SMC series products are mainly used in various power supply circuits to protect the rear circuit from surge, EFT and electrostatic shock. Because the product has a larger power can also be used in automotive electronics to ISO7637 absorption.

SMC series products have Unidirectional and Bidirectional two types, users can choose flexibly.

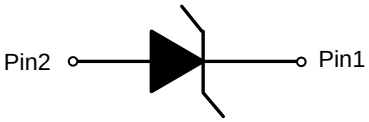


Unidirectional Bidirectional

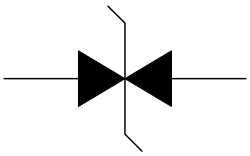
SMC
(JEDEC DO-214AB)

Features

- Peak pulse power:
  - 1500 W (10/1000 μs)
- Stand off voltage range: from 5 V to 440 V
- Unidirectional and bidirectional types
- JEDEC registered package outline



Unidirectional



Bidirectional

Schematic Diagram

Applications

- Power adapter
- Onboard power port

1 Characteristics

Table 1. Absolute maximum ratings (T_{amb} = 25 °C)

Symbol	Parameter		Value	Unit
P_{PP}	Peak pulse power dissipation(1)	$T_{j\ initial} = T_{amb}$	1500	W
T_{stg}	Storage temperature range		-65 to + 150	°C
T_j	Operating junction temperature range		-55 to + 150	°C
T_L	Maximum lead temperature for soldering during 10 s.		260	°C

1. For a surge greater than the maximum values, the diode will fail in short-circuit.

Figure 1. Electrical characteristics - definitions

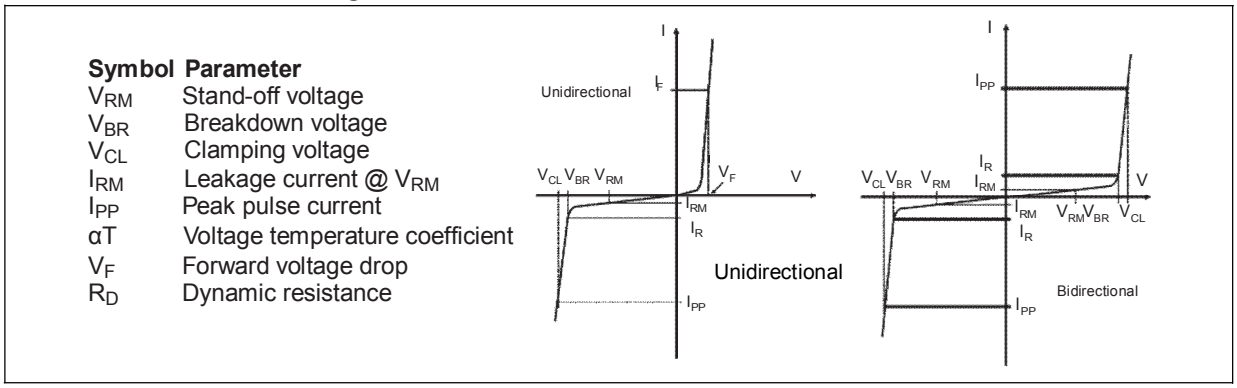


Figure 2. Pulse definition for electrical characteristics

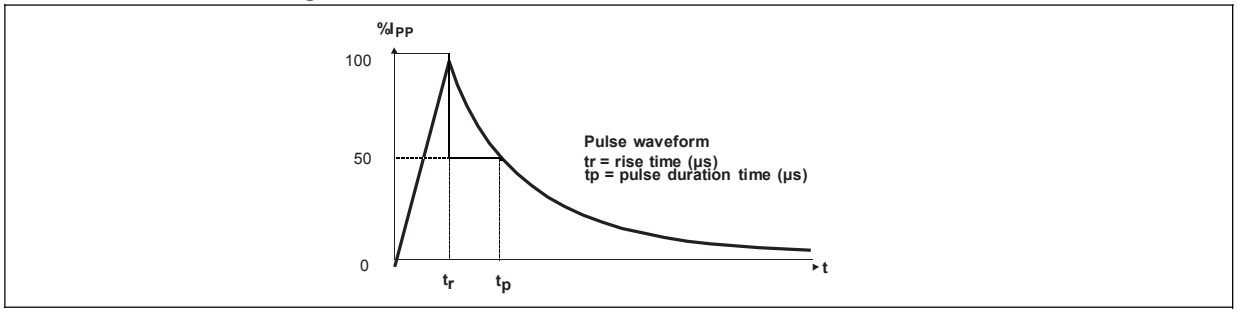


Table 2 Electrical characteristics parameter values (T_b = 25 °C)

Part Number		Reverse Stand-off Voltage	Breakdown Voltage Min.@I_T	Breakdown Voltage Max.@I_T	Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
UNI	BI	V_{RWM} (V)	V_{BR} (V)	V_{BR} (V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(uA)
SMC15 J5.0 V	SMC15 J5.0B	5.0	6.40	7.00	10	9.2	163.0	800
SMC15 J6.0 V	SMC15 J6.0B	6.0	6.67	7.37	10	10.3	145.7	800
SMC15 J6.5 V	SMC15 J6.5B	6.5	7.22	7.98	10	11.2	134.0	500
SMC15 J7.0 V	SMC15 J7.0B	7.0	7.78	8.60	10	12.0	125.0	200
SMC15 J7.5 V	SMC15 J7.5B	7.5	8.33	9.21	1	12.9	116.3	100
SMC15 J8.0 V	SMC15 J8.0B	8.0	8.89	9.83	1	13.6	110.3	50
SMC15 J8.5 V	SMC15 J8.5B	8.5	9.44	10.40	1	14.4	104.2	20
SMC15 J9.0 V	SMC15 J9.0B	9.0	10.00	11.10	1	15.4	97.4	10
SMC15 J10 V	SMC15 J10B	10.0	11.10	12.30	1	17.0	88.3	5
SMC15 J11 V	SMC15 J11B	11.0	12.20	13.50	1	18.2	82.5	1
SMC15 J12 V	SMC15 J12B	12.0	13.30	14.70	1	19.9	75.4	1
SMC15 J13 V	SMC15 J13B	13.0	14.40	15.90	1	21.5	69.8	1
SMC15 J14 V	SMC15 J14B	14.0	15.60	17.20	1	23.2	64.7	1
SMC15 J15 V	SMC15 J15B	15.0	16.70	18.50	1	24.4	61.5	1
SMC15 J16 V	SMC15 J16B	16.0	17.80	19.70	1	26.0	57.7	1
SMC15 J17 V	SMC15 J17B	17.0	18.90	20.90	1	27.6	54.4	1
SMC15 J18 V	SMC15 J18B	18.0	20.00	22.10	1	29.2	51.4	1
SMC15 J20 V	SMC15 J20B	20.0	22.20	24.50	1	32.4	46.3	1
SMC15 J22 V	SMC15 J22B	22.0	24.40	26.90	1	35.5	42.3	1
SMC15 J24 V	SMC15 J24B	24.0	26.70	29.50	1	38.9	38.6	1
SMC15 J26 V	SMC15 J26B	26.0	28.90	31.90	1	42.1	35.7	1
SMC15 J28 V	SMC15 J28B	28.0	31.10	34.40	1	45.4	33.1	1
SMC15 J30 V	SMC15 J30B	30.0	33.30	36.80	1	48.4	31.0	1
SMC15 J33 V	SMC15 J33B	33.0	36.70	40.60	1	53.3	28.2	1
SMC15 J36 V	SMC15 J36B	36.0	40.00	44.20	1	58.1	25.9	1
SMC15 J40 V	SMC15 J40B	40.0	44.40	49.10	1	64.5	23.3	1
SMC15 J43 V	SMC15 J43B	43.0	47.80	52.80	1	69.4	21.7	1
SMC15 J45 V	SMC15 J45B	45.0	50.00	55.30	1	72.7	20.6	1
SMC15 J48 V	SMC15 J48B	48.0	53.30	58.90	1	77.4	19.4	1
SMC15 J51 V	SMC15 J51B	51.0	56.70	62.70	1	82.4	18.2	1
SMC15 J54 V	SMC15J54B	54.0	60.00	66.30	1	87.1	17.3	1
SMC15 J58 V	SMC15 J58B	58	64.40	71.20	1	93.6	16.1	1

Electrical characteristics parameter values (Tb = 25 °C)

Part Number		Reverse Stand-off Voltage	Breakdown Voltage Min.@I_T	Breakdown Voltage Max.@I_T	Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
UNI	BI	V_{RWM} (V)	V_{BR} (V)	V_{BR} (V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(uA)
SMC15 J60V	SMC15 J60B	60	66.70	73.70	1	96.8	15.5	1
SMC15 J64V	SMC15 J64B	64	71.10	78.60	1	103.0	14.6	1
SMC15 J70V	SMC15 J70B	70	77.80	86.00	1	113.0	13.3	1
SMC15 J75V	SMC15 J75B	75	83.30	92.10	1	121.0	12.4	1
SMC15 J78V	SMC15 J78B	78	86.70	95.80	1	126.0	11.9	1
SMC15 J85V	SMC15 J85B	85	94.40	104.00	1	137.0	11.0	1
SMC15 J90V	SMC15 J90B	90	100.00	111.00	1	146.0	10.3	1
SMC15 J100V	SMC15 J100B	100	111.00	123.00	1	162.0	9.3	1
SMC15 J110V	SMC15 J110B	110	122.00	135.00	1	177.0	8.5	1
SMC15 J120V	SMC15 J120B	120	133.00	147.00	1	193.0	7.8	1
SMC15 J130V	SMC15 J130B	130	144.00	159.00	1	209.0	7.2	1
SMC15 J150V	SMC15 J150B	150	167.00	185.00	1	243.0	6.2	1
SMC15 J160V	SMC15 J160B	160	178.00	197.00	1	259.0	5.8	1
SMC15 J170V	SMC15 J170B	170	189.00	209.00	1	275.0	5.5	1
SMC15 J180V	SMC15 J180B	180	201.00	222.00	1	292.0	5.1	1
SMC15 J200V	SMC15 J200B	200	224.00	247.00	1	324.0	4.6	1
SMC15 J220V	SMC15 J220B	220	246.00	272.00	1	356.0	4.2	1
SMC15 J250V	SMC15 J250B	250	279.00	309.00	1	405.0	3.7	1
SMC15 J300V	SMC15 J300B	300	335.00	371.00	1	486.0	3.1	1
SMC15 J350V	SMC15 J350B	350	391.00	432.00	1	567.0	2.6	1
SMC15 J400V	SMC15 J400B	400	447.00	494.00	1	648.0	2.3	1
SMC15 J440V	SMC15 J440B	440	492.00	543.00	1	713.0	2.1	1

Figure 3. Peak pulse power dissipation versus initial junction temperature (typical value)

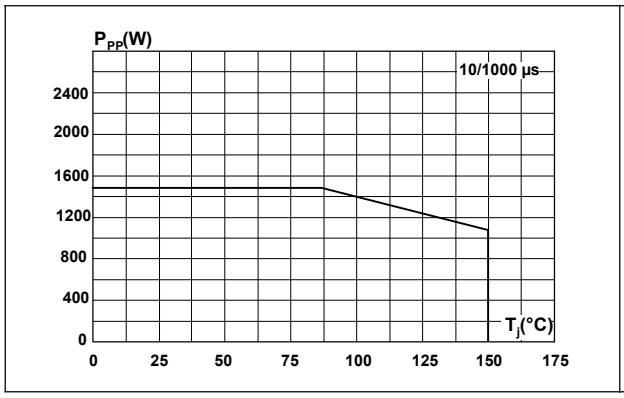


Figure 4. Peak pulse power versus exponential pulse duration (T_j initial = 25 °C)

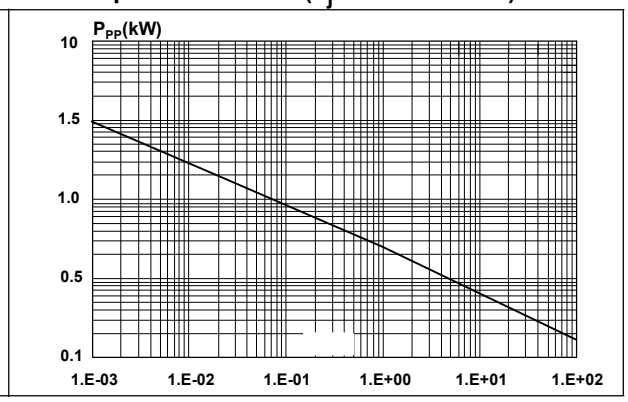


Figure 5. Clamping voltage versus peak pulse current (exponential waveform, maximum values)

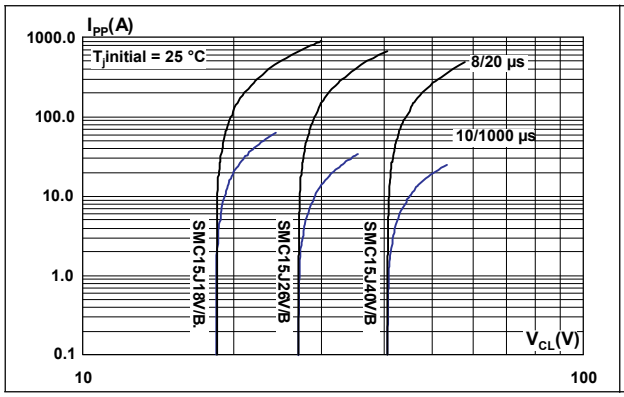


Figure 6. Junction capacitance versus reverse applied voltage for unidirectiona types (typical values)

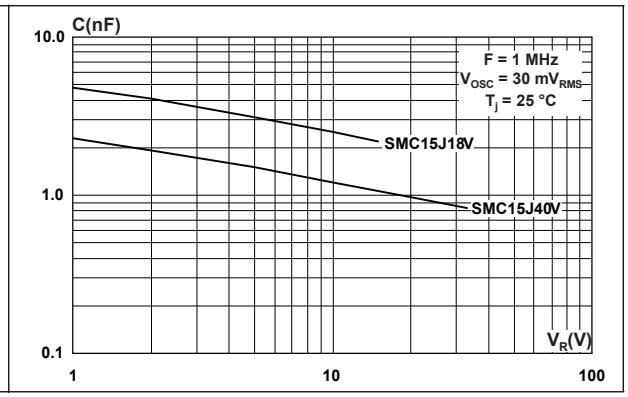


Figure 7. Junction capacitance versus reverse applied voltage for bidirectional types (typical values)

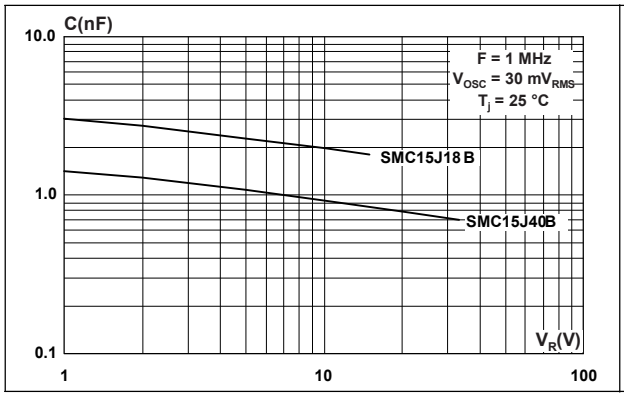


Figure 8. Leakage current versus junction temperature (typical values)

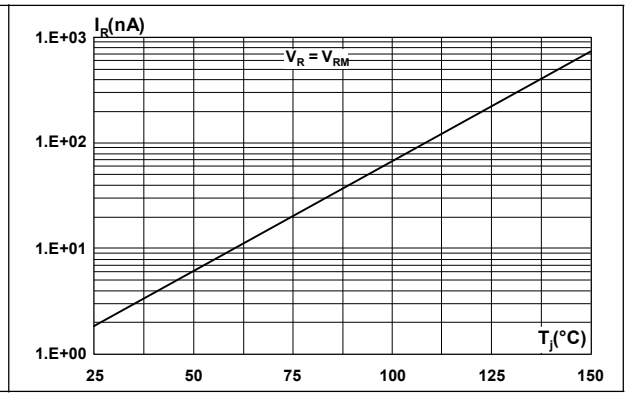


Figure 9. Peak forward voltage drop versus peak forward current (typical values)

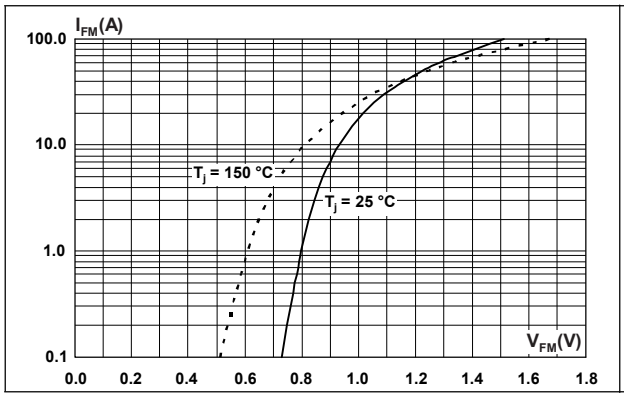


Figure 10. Relative variation of thermal impedance, junction to ambient, versus pulse duration

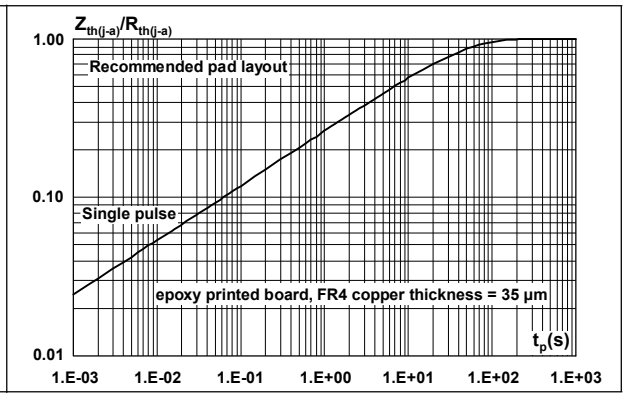
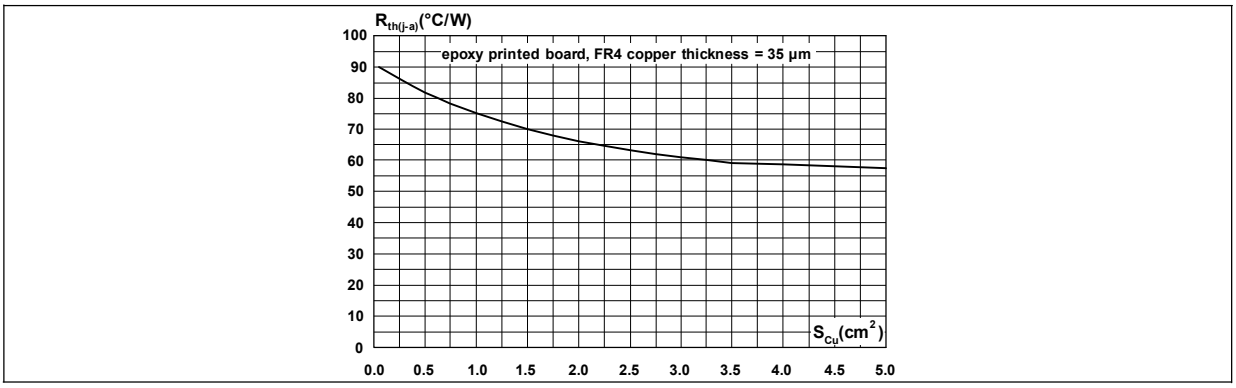


Figure 11. Thermal resistance junction to ambient versus copper surface under each lead



2 Application and design guidelines

More information is available in the Application note AN2689 “Protection of automotive electronics from electrical hazards, guidelines for design and component selection”.

3 Package information

- Case: JEDEC DO-214AB molded plastic over planar junction
- Terminals: solder plated, solderable as per MIL-STD-750, Method 2026
- Polarity: for unidirectional types the band indicates cathode
- Flammability: epoxy is rated UL 94, V0
- RoHS package

Figure 16. IPAK dimension definitions

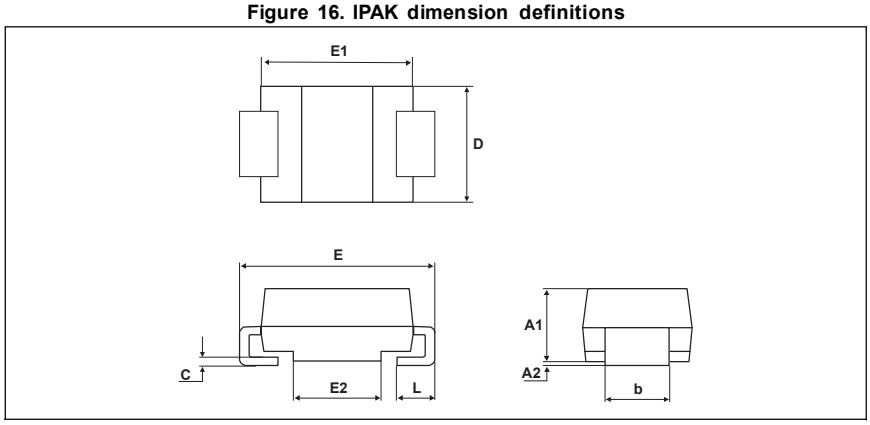


Table 3. SMC dimension values

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.80	0.075	0.110
A2	0.05	0.20	0.002	0.008
b	2.90	3.20	0.114	0.126
c	0.15	0.40	0.006	0.016
D	5.55	6.25	0.218	0.246
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
L	0.75	1.50	0.030	0.059

Figure 17. SMC footprint dimensions in mm (inches)