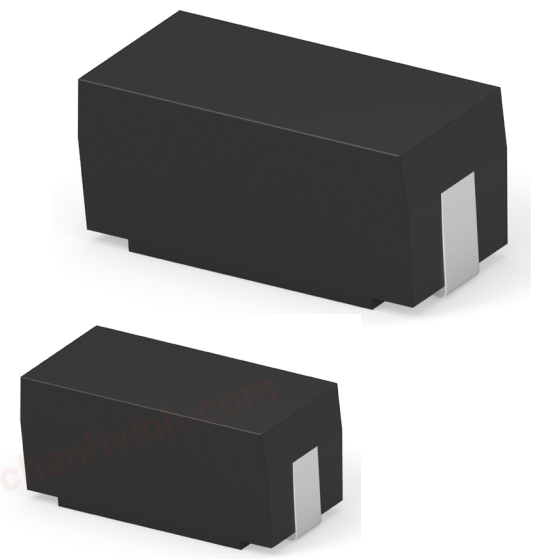
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SMD MOULDED POWER RESISTOR

TYPE SMQ SERIES | AEC-Q200 QUALIFIED

INTRODUCTION

TE Connectivity (TE) introduces an AEC-Q200 qualified version of its SM series surface mount power resistor, adding UL94V0 flame resistance. Available in 3 ratings up to 3 watts and supplied on tape and reel for automatic insertion process.



FEATURES

- Available on tape
- Very wide value range
- Excellent for power circuitry
- Available in 3 ratings up to 3 watts
- Flame resistant coating UL94V0
- AEC-Q200 qualified

APPLICATIONS

- Automotive
- Servo drives
- Factory automation
- Battery energy storage systems
- Power distribution units

ELECTRICAL CHARACTERISTICS

	SMQ_1 – Wire	SMQ_1 – Film	SMQ_2 – Wire	SMQ_2 – Film	SMQ_3 – Wire	SMQ_3 – Film
Values SMQ_1	R10 – 200R	201R – 2M	R10 – 300R	301R – 2M	R10 – 500R	501R – 2M
Value grid	E24					
Resistance tolerance	1% or 5%					
Power rating @ 20°C	1.0 Watts	1.0 Watts	2.0 Watts	2.0 Watts	3.0 Watts	3.0 Watts
Derating	See Curve Below					
Max operating voltage SMQ_1	300 Volts	300 Volts	500 Volts			
Operating temperature range	-55 ~ 150°C					
Temperature coefficient of resistance	± 200ppm /°C	± 100ppm /°C	± 200ppm /°C	± 100ppm /°C	± 200ppm /°C	± 100ppm /°C

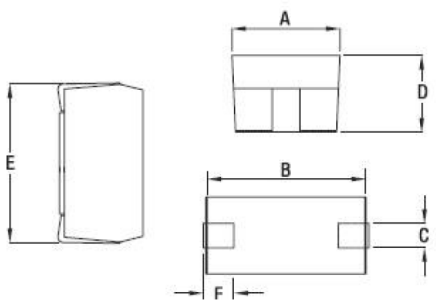
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ENVIRONMENTAL CHARACTERISTICS

Test	Condition	SMQ – Wire	SMQ – Metal Film
Temperature coefficient of resistance	-55°C – +150°C	± 200ppm /°C	± 100ppm /°C
Rated load	Rated voltage for 30 minutes surface temp. 200°C max.	± 1%	± 1%
Short time overload	5 times of rated wattage for 5 sec.	± 1%	± 0.5%
Voltage withstand	500VAC for 60 seconds	No physical damage	
Insulation resistance	500VDC megger	10,000 MΩ	10,000 MΩ
Solderability	235°C ±5°C for 2 seconds	95% coverage	
Resistance to soldering heat	270°C ±5°C for 10 ±1 seconds	Resistance value change within ± 1%	
Temperature cycle	Step / Temp.(°C) / Time (m): 1 / -55±3 / 30; 2 / Room Temp. / 2-3; 3 / 150±3 / 30; 4 / Room Temp / 2-3; 5 Cycles	Resistance change rate within ±1%	
Load life	Rated power load 1.5 hrs ON 0.5 hrs OFF 70°C 95% RH 1000 hours	± 2%	± 1%
Humidity load life	Rated power load 1.5 hrs ON 0.5 hrs OFF 40°C 95% RH 500 hours	± 2%	± 1%

DIMENSIONS (UNIT: mm)



	A±0.3	B±0.3	C±0.3	D±0.3	E Max.	F±0.3	Reel Qty
SMQ 1W	4.0	6.7	1.4	3.55	7.9	1.5	2000
SMQ 2W	5.5	10.5	1.7	5.0	12.0	2.3	1000
SMQ 3W	7.3	13.5	1.7	6.8	17.0	2.5	500

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PERFORMANCE CHARACTERISTICS

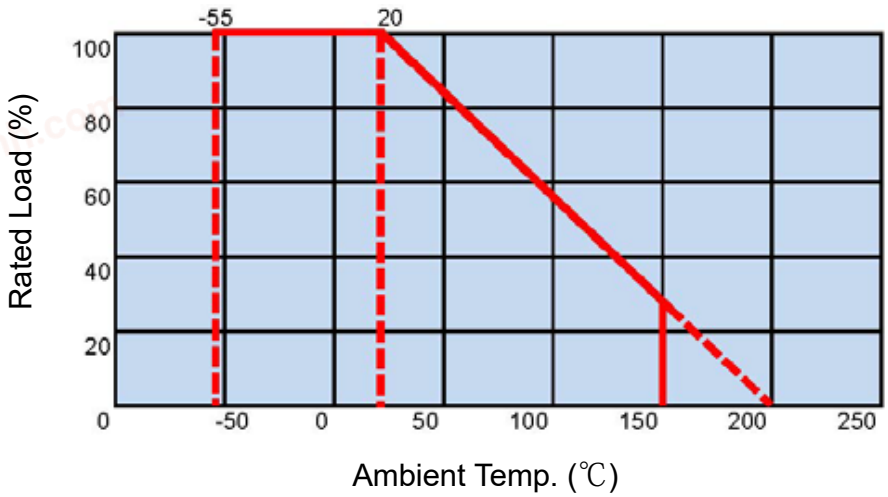
Test	Condition	SMQ – Wire	SMQ – Metal Film
High temperature exposure	125°C ±3°C, 1000 hrs without load. **MIL-STD-202 method 108**	≤±0.5%	
Temperature cycling	1000 cycles (-55°C – +125°C) measurement at 24±4 hours after test conclusion. 30 min maximum dwell time at each temperature extreme. 1 min. maximum transition time. **JESD22 Method JA-104**	≤±1%	
Moisture resistance	85°C±2°C, 85%RH 1000 hours without load	≤±0.5%	
Biased humidity	1000 hours 85%RH. Note: Specified conditions: 10% of operating power. Measurement at 24 ±4 hours after test conclusion. **MIL-STD-202 Method 103**	≤±2%	≤±1%
Operational life	Steady state TA=125°C at rated power. Measurement at 24±4 hours after test conclusion. **MIL-STD-202 Method 108**	≤±2%	≤±1%
Physical dimension	Verify physical dimensions to the applicable device detail specification. Note: User and suppliers spec. **JESD22 Method JB-100**	Electrical test not required.	
Resistance to solvents	Note: Add Aqueous wash chemical – OKEM clean or equivalent. Do not use banned solvents. **MIL-STD-202 Method 215**	No abnormality on appearance	
Vibration	5 g's for 20 min., 12 cycles each of 3 orientations. Test from 10-2000 Hz. **MIL-STD-202 Method 204**	≤±0.5%	
Resistance to soldering heat	Solder bath temp. 270±10°C for 10s. **MIL-STD-202 Method 210**	≤±1%	
Mechanical shock	Pulse form: Half sine / Acceleration: 100g±20% Peak duration: 6ms±30% / Number of shocks 3 per direction Shock direction: ±X, ±Y, ±Z / Total shocks: 18 **MIL-STD-202 Method 213**	≤±0.5%	
ESD	Cd=150pf Rd=2000Ω Voltage: 2KV **AEC-Q200-002**	≤±0.5% HBM: +1 pos. +1 neg. discharge 2KV	
Solderability	Solder bath temperature: 235±5°C Dipping time: 2s **J-STD-002**	95% coverage	
Temperature coefficient of resistance	T.C (ppm/°C) = [(R2-R1)÷R1] x [1÷(T2-T1)]x10^6 R1: resistance value at reference temperature R2: resistance value at test temp. T1: reference temp. (usu. 25°C) T2: test temp. (about 125°C)	± 200ppm /°C	± 100ppm /°C

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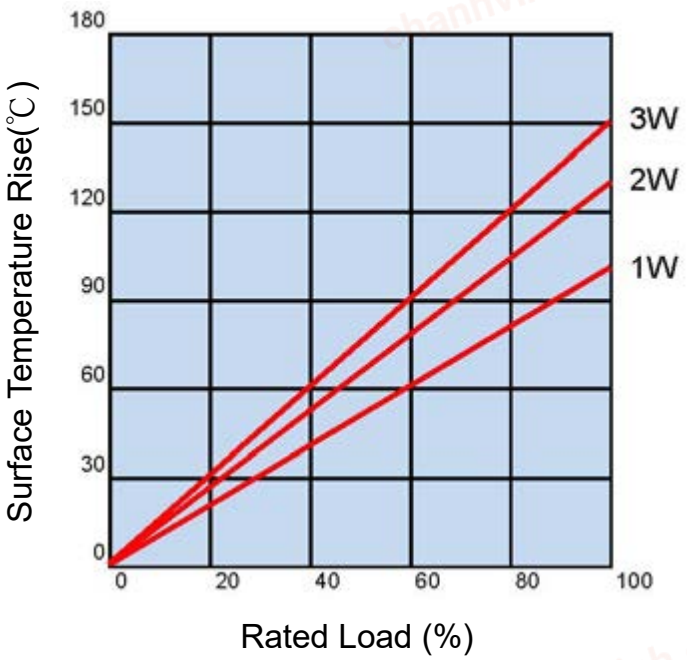
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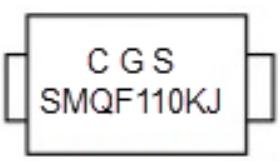
DERATING CURVE



SURFACE TEMPERATURE RISE



MARKING



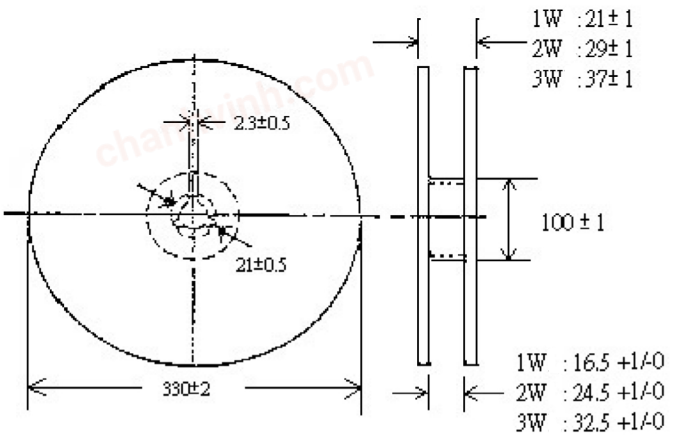
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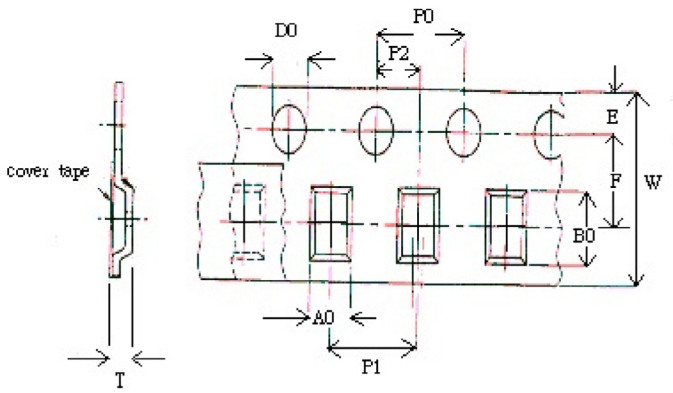
PACKAGING (UNIT: mm)

SMQ 1W – 3W

REEL

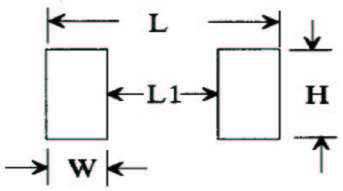


TAPE



Rated Power	B0 ± 0.2	A0 ± 0.2	P1 ± 0.1	P2 ± 0.1	P0 ± 0.1	D0 ± 0.1	E ± 0.1	F ± 0.1	W ± 0.3	T ± 0.1	pcs/reel
1W	8	4.3	8	2	4	1.5	1.75	7.5	16	4.15	2000
2W	11.8	5.8	12	2	4	1.5	1.75	11.5	24	5.8	1000
3W	17.5	7.8	16	2	4	1.5	1.75	14.2	32	7.5	500

RECOMMENDED LAND PATTERN



Rated Power	Dimension (mm)			
	W	H	L	L1
1W	2.6	2.0	9.2	4.0
2W	4.0	3.4	14	6.0
3W	4.5	3.4	18	9.0

STORAGE CONDITIONS

Product to be stored at a temperature between 5°C and 35°C and a relative humidity between 40% and 75%, in a chemical and dust free atmosphere

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ORDERING INFORMATION

Part Number

SMQ	F	3	10K	J	T

Common part

SMQ	

Type

W	Wirewound
F	Metal film

Case size

1	1 Watts
2	2 Watts
3	3 Watts

Resistance value

0.1 ohm (100 milli ohms)	R10
1 ohm	1R0
100 ohm	100R
1K ohm (1000 ohms)	1K0
100K ohm (100,000 ohms)	100K

Tolerance

J	±5%
F	±1%

Pack style

T	Tape & Reel

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