

Signal Inductor Wire Wound Ceramic Chip Type

SIE-MM17 Series

MERITEK

FEATURE

- Miniature size, low profile
- High current and high SRF
- High Q value and tight inductance tolerance
- Excellent solderability and heat resistance
- AEC-Q200 Qualified
- Applications: RF Products: Remote Control, GPS Receiver; Broad Band Applications: CATV Filter,Tuner, Cable Modem/XDSL Tuner; IT Applications: USD 2.0, IEEE 1394

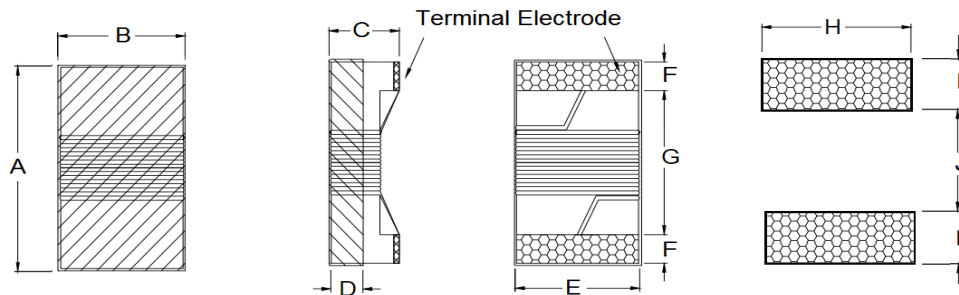


PART NUMBERING SYSTEM

SIE (1) 02 (2) J (3) 18N (4) MM17 (5)

No	item	Digit	Description	Series Reference
(1)	Product code	SIE	Signal Inductor series	Wire Wound Ceramic Chip Type
(2)	Dimension Code	02	02: 0402	1.0x0.50mm
(3)	Tolerance	J	J: $\pm 5\%$	C: $\pm 0.2\text{nH}$; D: $\pm 0.5\text{nH}$ G: $\pm 2\%$;
(4)	Inductance	18N	18N: 18nH	10N: 10nH, 1N5: 1.5nH; R10: 100nH
(5)	Series Code	MM17	Wire Wound Ceramic Chip Inductor	AEC-Q200 Compliance

DIMENSION



Size	A (max)	B (max)	C (max)	D (Ref.)	E	F	G	H	I	J
0402	1.27	0.76	0.61	0.15	0.51	0.23	0.56	0.66	0.50	0.46

ELECTRICAL CHARACTERISTIC

Part Number	Inductance	Tolerance	L Test Freq.	Quality Factor	Q Test Freq.	SRF Min	DCR Max	IDC Max
	(nH)	($\pm \%$)	(MHz)	Min	(MHz)	(GHz)	(Ω)	(mA)
SIE02□1N5MM17	1.5	$\pm 0.2\text{nH}, \pm 0.5\text{nH}$	100	10	250	18	0.03	1000
SIE02□2N4MM17	2.4	$\pm 0.2\text{nH}, \pm 0.5\text{nH}$	100	20	250	15	0.05	850
SIE02□2N5MM17	2.5	$\pm 0.2\text{nH}, \pm 0.5\text{nH}$	100	20	250	15	0.05	850
SIE02□2N7MM17	2.7	$\pm 0.2\text{nH}, \pm 0.5\text{nH}$	100	20	250	15	0.05	850
SIE02□2N9MM17	2.9	$\pm 0.2\text{nH}, \pm 0.5\text{nH}$	100	20	250	15	0.07	750
SIE02□3N9MM17	3.9	$\pm 0.2\text{nH}, \pm 0.5\text{nH}$	100	25	250	10	0.07	750
SIE02□4N1MM17	4.1	$\pm 0.2\text{nH}, \pm 0.5\text{nH}$	100	25	250	10	0.07	750
SIE02□4N3MM17	4.3	$\pm 0.2\text{nH}, \pm 0.5\text{nH}$	100	25	250	10	0.07	750
SIE02□4N7MM17	4.7	$\pm 0.2\text{nH}, \pm 0.5\text{nH}$	100	25	250	8.0	0.07	750

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Part Number	Inductance	Tolerance	L Test Freq.	Quality Factor	Q Test Freq.	SRF Min	DCR Max	IDC Max
	(nH)	(± %)	(MHz)	Min	(MHz)	(GHz)	(Ω)	(mA)
SIE02□5N1MM17	5.1	±0.2nH,±0.5nH	100	25	250	8.0	0.12	600
SIE02□5N8MM17	5.8	±0.2nH,±0.5nH	100	25	250	8.0	0.12	700
SIE02□6N2MM17	6.2	±0.2nH,±0.5nH	100	25	250	8.0	0.09	700
SIE02□6N8MM17	6.8	±5%	100	25	250	6.0	0.09	700
SIE02□7N3MM17	7.3	±5%	100	25	250	6.0	0.13	570
SIE02□7N5MM17	7.5	±5%	100	25	250	6.0	0.13	570
SIE02□8N2MM17	8.2	±5%	100	25	250	5.5	0.14	540
SIE02□8N7MM17	8.7	±5%	100	25	250	5.5	0.14	540
SIE02□9N1MM17	9.1	±5%	100	25	250	5.5	0.14	540
SIE02□9N5MM17	9.5	±5%	100	25	250	5.5	0.14	540
SIE02□10NMM17	10	±2%,±5%	100	25	250	5.5	0.17	500
SIE02□11NMM17	11	±2%, ±5%	100	30	250	5.5	0.14	500
SIE02□12NMM17	12	±2%, ±5%	100	30	250	5.5	0.14	500
SIE02□13NMM17	13	±2%, ±5%	100	25	250	5.0	0.21	430
SIE02□15NMM17	15	±2%, ±5%	100	30	250	5.0	0.16	460
SIE02□16NMM17	16	±2%, ±5%	100	25	250	4.5	0.24	370
SIE02□18NMM17	18	±2%, ±5%	100	25	250	4.5	0.27	370
SIE02□19NMM17	19	±2%, ±5%	100	25	250	4.5	0.27	370
SIE02□20NMM17	20	±2%, ±5%	100	25	250	4.0	0.27	370
SIE02□22NMM17	22	±2%, ±5%	100	25	250	4.0	0.30	310
SIE02□23NMM17	23	±2%, ±5%	100	25	250	3.8	0.30	310
SIE02□24NMM17	24	±2%, ±5%	100	25	250	3.5	0.52	280
SIE02□27NMM17	27	±2%, ±5%	100	25	250	3.5	0.52	280
SIE02□30NMM17	30	±2%, ±5%	100	25	250	3.3	0.58	270
SIE02□33NMM17	33	±2%, ±5%	100	25	250	3.2	0.63	260
SIE02□36NMM17	36	±2%, ±5%	100	25	250	3.1	0.63	260
SIE02□39NMM17	39	±2%, ±5%	100	25	250	3.0	0.70	250
SIE02□40NMM17	40	±2%, ±5%	100	25	250	3.0	0.70	250
SIE02□43NMM17	43	±2%, ±5%	100	25	250	3.0	0.70	250
SIE02□47NMM17	47	±2%, ±5%	100	25	200	2.9	1.08	210
SIE02□51NMM17	51	±2%, ±5%	100	25	200	2.9	1.08	210
SIE02□56NMM17	56	±2%, ±5%	100	25	200	2.8	1.17	200
SIE02□62NMM17	62	±2%, ±5%	100	20	200	2.6	1.92	145
SIE02□68NMM17	68	±2%, ±5%	100	20	200	2.5	1.96	140
SIE02□72NMM17	72	±2%, ±5%	100	20	150	2.5	2.10	135
SIE02□75NMM17	75	±2%, ±5%	100	20	150	2.4	2.10	135
SIE02□82NMM17	82	±2%, ±5%	100	20	150	2.3	2.24	130
SIE02□91NMM17	91	±2%, ±5%	100	20	150	2.1	2.38	125
SIE02□R10MM17	100	±5%	100	20	150	1.5	2.52	120
SIE02□R12MM17	120	±5%	100	20	150	1.0	2.66	110

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RELIABILITY TEST CONDITON AND REQUIREMENT

Item	Test Conditions / Equipment	Requirement	
Withstanding Voltage	AC voltage of 500 VAC applied between inductors terminal and case for 1 min.	Inductors shall show no evidence of electrical and mechanical damage	
Insulation Resistance	100 VDC applied between inductor terminal and case	1000M Ω min.	
Overload	Applied 2 times of rated allowed DC current to inductor for a period of 5 minutes	Inductors shall show no evidence of electrical and mechanical damage	
Vibration	Test device shall be soldered on the substrate Oscillation Frequency: 10 to 55 to 10Hz for 1 min. Amplitude: 1.5 mm Time: 2 hrs for each axis (X, Y &Z), total 6 hrs	Appearance: no damage Inductance change: within $\pm 5\%$ Q change: within $\pm 10\%$	
Solderability	Inductor shall be dipped in a melted solder bath at 245 ± 5 °C for 3 seconds	90% covered with solder	
Resistance to Soldering Heat	Solder Temperature: 265 ± 5 °C Immersion Time: 10 ± 2 seconds	Appearance: no damage Inductance change: within $\pm 5\%$ Q change: within $\pm 10\%$	
Component Adhesion (Push Test)	The device should be soldered (260 ± 5 for 10 seconds) to a tinned copper subs rate. A dynamiter force gauge should be applied to the side of the component. The device must with stand a minimum force of 2 or 4 pounds without a failure of adhesion on termination	0402: ≥ 1 lbs. 0603: ≥ 2 lbs. Other Sizes: ≥ 3 lbs.	
Drop	Dropping chip by each side and each corner. Drop 10 times in total. Drop Height: 100cm; Drop Weight: 125g	No damage	
Resistance to Solvent	MIL-STD-202G, Method 215K	No damage on appearance and marking	
Humidity	Temperature: 40 ± 2 °C Relative Humidity: 90~95 % Time: 96 ± 2 hrs Measured after exposure in room condition for 2 hours.	Appearance: no damage Inductance change: within $\pm 10\%$ Q change: within $\pm 20\%$	
Low Temperature Storage	Temperature: -40 ± 2 °C Time: 96 ± 2 hrs Tested after 1 hour at room temperature	Appearance: no damage Inductance change: within $\pm 10\%$ Q change: within $\pm 20\%$	
Thermal Shock	One cycle		
	Step	Temperature (°C)	Time (min.)
	1	-25 ± 3	30
	2	$+25 \pm 2$	15
	3	$+125 \pm 3$	30
4	$+25 \pm 2$	15	
Total of 5 cycles		Appearance: no damage Inductance change: within $\pm 10\%$ Q change: within $\pm 20\%$	
High Temperature Storage	Temperature: 125 ± 2 °C Time: 96 ± 2 hrs Measured after exposure in room condition for 1 hour.	Appearance: no damage Inductance change: within $\pm 10\%$ Q change: within $\pm 20\%$	
High Temperature load Life	Temperature: 85 ± 2 °C Time: 1000 ± 12 hrs Load: Allowed DC current	There should be no evidence of short or open circuit.	
Damp Heat with Load	Temperature: 40 ± 2 °C Relative Humidity: 90~95 % Time: 1000 ± 12 hrs Load: Allowed DC current	There should be no evidence of short or open circuit.	

Notes: Operating Temperature: -40 °C ~ $+125$ °C; Storage Temperature: 15 ~ 28 °C; Humidity < 80%RH

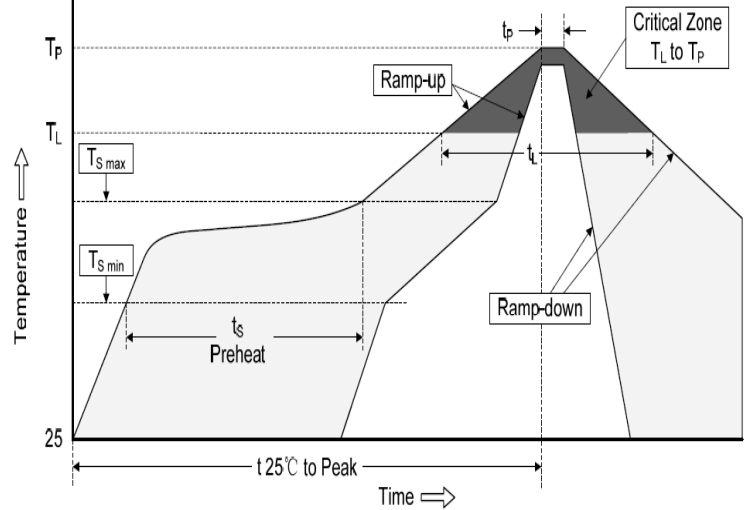
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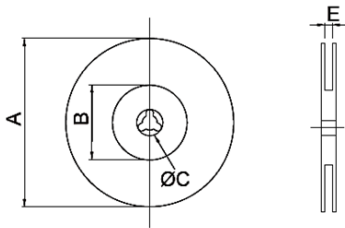
RECOMMENDED SOLDERING PROFILES

Reflow Condition		
Pre Heat	Temp. Min $T_{s(min)}$	150°C
	Tempe. Max $T_{s(max)}$	180°C
	Time (min. to max.) (t_s)	90-120 seconds
Average ramp up rate (Liquidus Temperature) (T_A) to peak		3°C/second max.
$T_{s(max)}$ to T_A (Ramp-up rate)		3°C/second max.
Reflow	Temp. (T_A) (Liquidus)	230°C
	Time (min. to max.) (t_s)	40 seconds Max
Peak Temperature (T_P)		255 ^{+/-0.5} °C
Time within 5°C of actual peak Temperature (t_p)		10 seconds
Ramp-down Rate		6°C/second max.

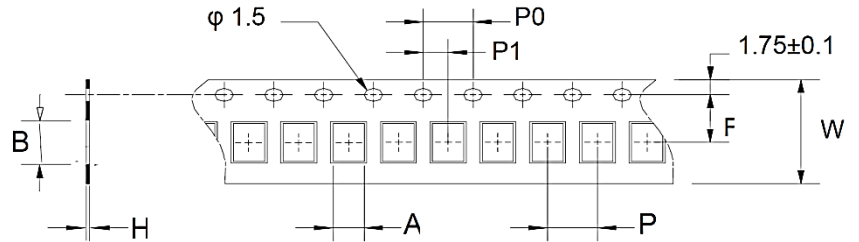


PACKAGING SPECIFICATION

Reel Specification



Paper Tape



Size	Reel Dimension (mm)					Reel (EA)	Weight (1000pcs)
	A	B	C	E			
0402	178±2.0	60±0.5	13±0.3	9±0.3		10,000	0.8g

Size	Embossed Plastic Tape Dimension (mm)							
	A	B	H	F	P	P0	P1	W
0402	0.81	1.23	0.60	3.50	2.00	4.00	2.00	8.00

*Specifications subject to change without notice.