

## FEATURES

SMI chip inductors are JARO'S line of high performance wound chip inductors. The SMI chip inductors are constructed with a wire wound structure and have a higher current capacity than multilayer chip inductors. SMI chip inductors have high quality characteristics suitable for your design needs.

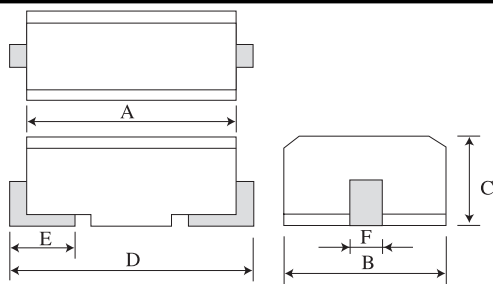
**Excellent Inductor Characteristics:** SMI chip inductors have high Q values and high self-resonant frequencies.

**Multiple Size Availability:** SMI chip inductors are available in three sizes: 252018, 322522 and 453232.

## APPLICATIONS

The SMI chip inductors can be used in a variety of electronics, including: Computers, Computer Peripheral, Cordless Phones.

## PRODUCT DIMENSIONS



	252018	322522	453232
A:	2.4±0.30	3.20±0.40	4.5±0.30
B:	2.0±0.30	2.50±0.30	3.20±0.30
C:	1.8±0.30	2.20±0.30	3.20±0.30
D:	2.4±0.30	2.90±0.20	4.10±0.30
E:	0.45±0.10	0.60±0.10	1.00±0.30
F:	1.4±0.20	1.10±0.30	1.45±0.30

in mm

## ELECTRICAL CHARACTERISTICS

PART NO	INDUCTANCE (μH)	Q MIN.	LQ TEST FREQUENCY (MHz) MIN.	SELF RESONANT FREQUENCY (MHz) MIN.	DC RESISTANCE R <sub>DC</sub> (Ω) MAX.	RATED CURRENT I <sub>DC</sub> (mA) MAX.
SMI-252018-10NM	0.010±20%	25/100mhz	52/800mhz	100	2150	530
SMI-252018-12NM	0.012±20%	26/100mhz	52/800mhz	100	2050	500
SMI-252018-15NM	0.015±20%	26/100mhz	51/800mhz	100	1850	480
SMI-252018-18NM	0.018±20%	26/100mhz	52/800mhz	100	1650	450
SMI-252018-22NM	0.022±20%	28/100mhz	56/800mhz	100	1550	420
SMI-252018-27NM	0.027±20%	29/100mhz	51/800mhz	100	1400	410
SMI-252018-33NM	0.033±20%	30/100mhz	50/800mhz	100	1250	400
SMI-252018-39NM	0.039±20%	30/100mhz	39/800mhz	100	1100	380
SMI-252018-47NM	0.047±20%	30/100mhz	43/800mhz	100	1050	360
SMI-252018-56NM	0.056±20%	31/100mhz	35/800mhz	100	950	340
SMI-252018-68NM	0.068±20%	31/100mhz	27/800mhz	100	900	320
SMI-252018-82NM	0.082±20%	32/100mhz	29/800mhz	100	850	300
SMI-252018-R10M	0.10±20%	32/100mhz	20/800mhz	100	700	280
SMI-252018-R12M	0.12±20%	30		25.2	600	520
SMI-252018-R15M	0.15±20%	30		25.2	550	480
SMI-252018-R18M	0.18±20%	30		25.2	500	460
SMI-252018-R22M	0.22±20%	30		25.2	450	430

## ELECTRICAL CHARACTERISTICS

PART NO	INDUCTANCE ( $\mu$ H)	Q MIN.	LQ TEST FREQUENCY (MHz) MIN.	SELF RESONANT FREQUENCY (MHz) MIN.	DC RESISTANCE $R_{DC}$ ( $\Omega$ ) MAX.	RATED CURRENT $I_{DC}$ (mA) MAX.
SMI-252018-R27M	0.27 $\pm$ 20%	30	25.2	425	0.56	420
SMI-252018-R33M	0.33 $\pm$ 20%	30	25.2	400	0.60	400
SMI-252018-R39M	0.39 $\pm$ 20%	30	25.2	375	0.65	375
SMI-252018-R47M	0.47 $\pm$ 20%	30	25.2	350	0.68	350
SMI-252018-R56M	0.56 $\pm$ 20%	30	25.2	300	0.75	300
SMI-252018-R68M	0.68 $\pm$ 20%	30	25.2	270	0.85	300
SMI-252018-R82M	0.82 $\pm$ 20%	30	25.2	250	1.00	260
SMI-252018-1R0K	1.0 $\pm$ 10%	30	7.96	220	1.10	245
SMI-252018-1R2K	1.2 $\pm$ 10%	30	7.96	180	1.20	230
SMI-252018-1R5K	1.5 $\pm$ 10%	30	7.96	135	1.30	220
SMI-252018-1R8K	1.8 $\pm$ 10%	30	7.96	100	1.45	210
SMI-252018-2R2K	2.2 $\pm$ 10%	30	7.96	75	1.55	200
SMI-252018-2R7K	2.7 $\pm$ 10%	30	7.96	55	1.70	195
SMI-252018-3R3K	3.3 $\pm$ 10%	30	7.96	48	1.90	185
SMI-252018-3R9K	3.9 $\pm$ 10%	30	7.96	43	2.10	180
SMI-252018-4R7K	4.7 $\pm$ 10%	30	7.96	40	2.30	175
SMI-252018-5R6K	5.6 $\pm$ 10%	25	7.96	36	2.50	170
SMI-252018-6R8K	6.8 $\pm$ 10%	25	7.96	33	2.70	165
SMI-252018-8R2K	8.2 $\pm$ 10%	25	7.96	30	3.05	160
SMI-252018-100K	10 $\pm$ 10%	25	2.52	27	3.50	155
SMI-252018-120K	12 $\pm$ 10%	25	2.52	23	3.80	150
SMI-252018-150K	15 $\pm$ 10%	25	2.52	20	4.40	140
SMI-252018-180K	18 $\pm$ 10%	25	2.52	18	4.80	130
SMI-252018-220K	22 $\pm$ 10%	25	2.52	17	5.50	125
SMI-252018-270K	27 $\pm$ 10%	25	2.52	16	6.30	115
SMI-252018-330K	33 $\pm$ 10%	25	2.52	15	7.10	110
SMI-252018-390K	39 $\pm$ 10%	20	2.52	14	9.50	90
SMI-252018-470K	47 $\pm$ 10%	20	2.52	13	11.10	80
SMI-252018-560K	56 $\pm$ 10%	20	2.52	12	12.10	75
SMI-252018-680K	68 $\pm$ 10%	20	2.52	11	16.60	70
SMI-252018-820K	82 $\pm$ 10%	20	2.52	10	19.00	65
SMI-252018-101K	100 $\pm$ 10%	15	0.796	9	21.00	60

Operating temperatures -25C to +85C  
 5% Tolerance Available (ask your salesperson for details)  
 Revised 6-1-01

Standard Tolerance 10nH thru .82uH =20%  
 1.0uH thru 1000uH =10%

## ELECTRICAL CHARACTERISTICS

PART NO	INDUCTANCE ( $\mu$ H)	Q MIN.	LQ TEST FREQUENCY (MHz) MIN.	SELF RESONANT FREQUENCY (MHz) MIN.	DC RESISTANCE $R_{DC}$ ( $\Omega$ ) MAX.	RATED CURRENT $I_{DC}$ (mA) MAX.
SMI-322522-R10 □	0.10	28	100	700	0.44	450
SMI-322522-R12 □	0.12	30	25.2	500	0.22	450
SMI-322522-R15 □	0.15	30	25.2	450	0.25	450
SMI-322522-R18 □	0.18	30	25.2	400	0.28	450
SMI-322522-R22 □	0.22	30	25.2	350	0.32	450
SMI-322522-R27 □	0.27	30	25.2	320	0.36	450
SMI-322522-R33 □	0.33	30	25.2	300	0.40	400
SMI-322522-R39 □	0.39	30	25.2	250	0.45	450
SMI-322522-R47 □	0.47	30	25.2	220	0.50	450
SMI-322522-R56 □	0.56	30	25.2	180	0.55	450
SMI-322522-R68 □	0.68	30	25.2	160	0.60	450
SMI-322522-R82 □	0.82	30	25.2	140	0.65	450
SMI-322522-1R0 □	1.0	30	7.96	120	0.70	400
SMI-322522-1R2 □	1.2	30	7.96	100	0.75	390
SMI-322522-1R5 □	1.5	30	7.96	85	0.85	370
SMI-322522-1R8 □	1.8	30	7.96	80	0.90	350
SMI-322522-2R2 □	2.2	30	7.96	75	1.00	320
SMI-322522-2R7 □	2.7	30	7.96	70	1.10	290
SMI-322522-3R3 □	3.3	30	7.96	60	1.20	260
SMI-322522-3R9 □	3.9	30	7.96	55	1.30	250
SMI-322522-4R7 □	4.7	30	7.96	50	1.50	220
SMI-322522-5R6 □	5.6	30	7.96	47	1.60	200
SMI-322522-6R8 □	6.8	30	7.96	43	1.80	180
SMI-322522-8R2 □	8.2	30	7.96	40	2.00	170
SMI-322522-100 □	10	30	2.52	36	2.10	150
SMI-322522-120 □	12	30	2.52	33	2.50	140
SMI-322522-100 □	10	30	2.52	28	2.80	130
SMI-322522-180 □	18	30	2.52	25	3.30	120
SMI-322522-220 □	22	30	2.52	23	3.70	110
SMI-322522-270 □	27	30	2.52	18	5.00	80
SMI-322522-330 □	33	30	2.52	17	5.60	70
SMI-322522-390 □	39	30	2.52	16	6.40	65
SMI-322522-470 □	47	30	2.52	15	7.00	60
SMI-322522-560 □	56	30	2.52	13	8.00	55
SMI-322522-680 □	68	30	2.52	12	9.00	50
SMI-322522-820 □	82	30	2.52	11	10.0	45
SMI-322522-101 □	100	20	0.796	10	11.00	40

## ELECTRICAL CHARACTERISTICS

PART NO	INDUCTANCE ( $\mu$ H)	Q MIN.	LQ TEST FREQUENCY (MHz) MIN.	SELF RESONANT FREQUENCY (MHz) MIN.	DC RESISTANCE $R_{DC}$ ( $\Omega$ ) MAX.	RATED CURRENT $I_{DC}$ (mA) MAX.
SMI-453232-R10 □	0.10 $\pm$ 20%	35	25.2	300	0.18	800
SMI-453232-R12 □	0.12 $\pm$ 20%	35	25.2	280	0.20	770
SMI-453232-R15 □	0.15 $\pm$ 20%	35	25.2	250	0.22	730
SMI-453232-R18 □	0.18 $\pm$ 20%	35	25.2	220	0.24	700
SMI-453232-R22 □	0.22 $\pm$ 20%	40	25.2	200	0.25	665
SMI-453232-R27 □	0.27 $\pm$ 20%	40	25.2	180	0.26	635
SMI-453232-R33 □	0.33 $\pm$ 20%	40	25.2	165	0.28	605
SMI-453232-R39 □	0.39 $\pm$ 20%	40	25.2	150	0.30	575
SMI-453232-R47 □	0.47 $\pm$ 20%	40	25.2	145	0.32	545
SMI-453232-R56 □	0.56 $\pm$ 20%	40	25.2	140	0.36	520
SMI-453232-R68 □	0.68 $\pm$ 20%	40	25.2	135	0.40	500
SMI-453232-R82 □	0.82 $\pm$ 20%	40	25.2	130	0.45	475
SMI-453232-1R0 □	1.00 $\pm$ 10%	50	7.96	100	0.50	450
SMI-453232-1R2 □	1.20 $\pm$ 10%	50	7.96	80	0.55	430
SMI-453232-1R5 □	1.50 $\pm$ 10%	50	7.96	70	0.60	410
SMI-453232-1R8 □	1.80 $\pm$ 10%	50	7.96	60	0.65	390
SMI-453232-2R2 □	2.20 $\pm$ 10%	50	7.96	55	0.70	380
SMI-453232-2R7 □	2.70 $\pm$ 10%	50	7.96	50	0.75	370
SMI-453232-3R3 □	3.30 $\pm$ 10%	50	7.96	45	0.80	355
SMI-453232-3R9 □	3.90 $\pm$ 10%	50	7.96	40	0.90	330
SMI-453232-4R7 □	4.70 $\pm$ 10%	50	7.96	35	1.00	315
SMI-453232-5R6 □	5.60 $\pm$ 10%	50	7.96	33	1.10	300
SMI-453232-6R8 □	6.80 $\pm$ 10%	50	7.96	27	1.20	285
SMI-453232-8R2 □	8.20 $\pm$ 10%	50	7.96	23	1.40	270
SMI-453232-100 □	10.0 $\pm$ 10%	50	2.52	20	1.50	250
SMI-453232-120 □	12.0 $\pm$ 10%	50	2.52	18	2.00	225
SMI-453232-150 □	15.0 $\pm$ 10%	50	2.52	17	2.50	200
SMI-453232-180 □	18.0 $\pm$ 10%	50	2.52	15	2.80	190
SMI-453232-220 □	22.0 $\pm$ 10%	50	2.52	13	3.20	180
SMI-453232-270 □	27.0 $\pm$ 10%	50	2.52	12	3.60	170
SMI-453232-330 □	33.0 $\pm$ 10%	50	2.52	11	4.00	160
SMI-453232-390 □	39.0 $\pm$ 10%	50	2.52	10	4.50	150
SMI-453232-470 □	47.0 $\pm$ 10%	50	2.52	10	5.00	140
SMI-453232-560 □	56.0 $\pm$ 10%	50	2.52	9.0	5.50	135
SMI-453232-680 □	68.0 $\pm$ 10%	50	2.52	9.0	6.00	130
SMI-453232-820 □	82.0 $\pm$ 10%	50	2.52	8.0	7.00	120
SMI-453232-101 □	100 $\pm$ 10%	40	0.796	8.0	8.00	110

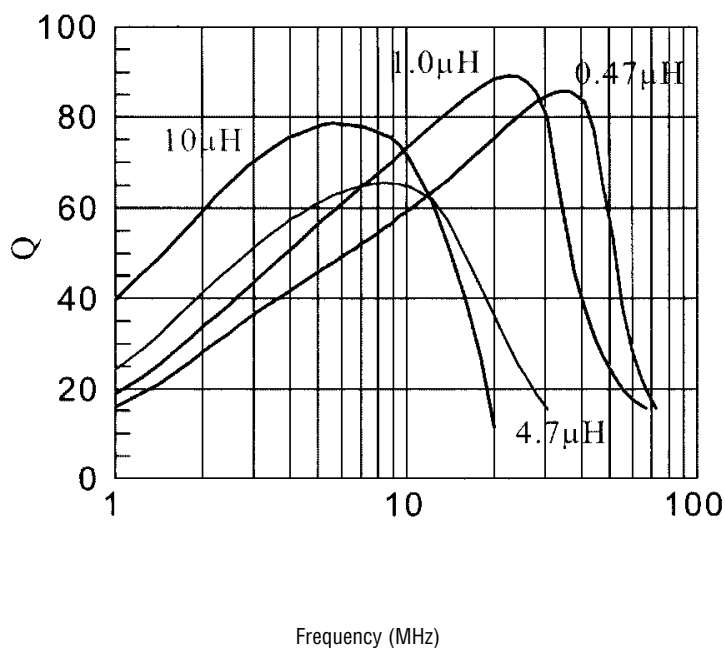
## ELECTRICAL CHARACTERISTICS

PART NO	INDUCTANCE (μH)	Q MIN.	LQ TEST FREQUENCY (MHz) MIN.	SELF RESONANT FREQUENCY (MHz) MIN.	DC RESISTANCE R <sub>DC</sub> (Ω) MAX.	RATED CURRENT I <sub>DC</sub> (mA) MAX.
SMI-453232-121 □	120±10%	40	0.796	6.0	8.00	110
SMI-453232-151 □	150±10%	40	0.796	5.0	9.00	105
SMI-453232-181 □	180±10%	40	0.796	5.0	9.50	102
SMI-453232-221 □	220±10%	40	0.796	4.0	10.0	100
SMI-453232-271 □	270±10%	40	0.796	4.0	12.0	92
SMI-453232-331 □	330±10%	40	0.796	3.5	14.0	85
SMI-453232-391 □	390±10%	40	0.796	3.0	16.0	80
SMI-453232-471 □	470±10%	40	0.796	3.0	26.0	62
SMI-453232-561 □	560±10%	30	0.796	3.0	30.0	50
SMI-453232-681 □	680±10%	30	0.796	3.0	30.0	50
SMI-453232-821 □	820±10%	30	0.796	2.5	35.0	50
SMI-453232-102 □	1000±10%	30	0.252	2.5	40.0	50

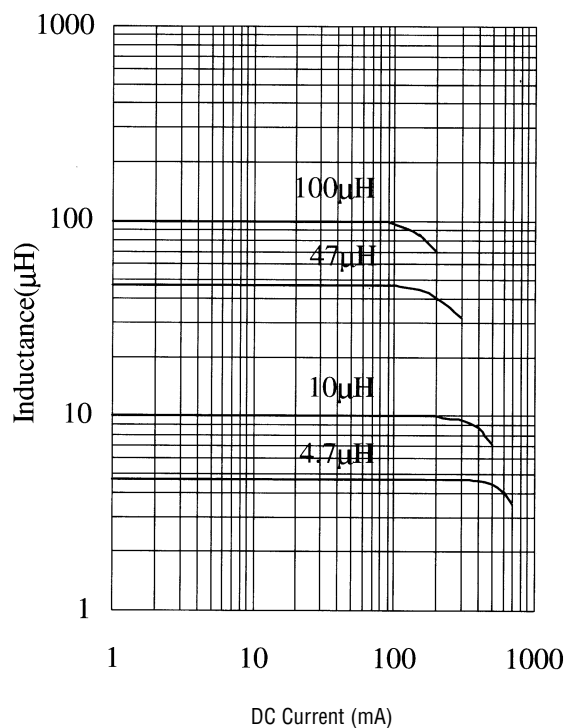
## TYPICAL ELECTRICAL CHARACTERISTIC CURVES

TEST EQUIPMENT: HP4284, HP-4291

Q-VALUE CURVES



TEST EQUIPMENT: HP4284



**RELIABILITY TEST**

**ELECTRICAL PERFORMANCE TEST**

ITEM	SPECIFICATION	TEST CONDITION / TEST METHOD
Inductance	Refer to Standard Electrical Characteristics List	Q-Meter: HP4342A, MQ-1601
Q	Refer to Standard Electrical Characteristics List	Impedance Analyzer: HP4191A, HP4291A
Self Resonant Frequency (SRF)	Refer to Standard Electrical Characteristics List	Wheatstone Bridge: YEW-2755 Digital Multimeter: HP3478A
Rated Current IDC	Refer to Standard Electrical Characteristics List	Applied the current to coils. The inductance change shall be less than 10% to initial value and temperature rise shall not be more than 20°C.
Temperature Rise Test	20°C Max.	1. Applied the allowed DC current for 10 minutes 2. Temperature measure by digital surface thermometer
Over Load Test	After test, inductor shall be no evidence of electrical and mechanical damage	Applied 2 times of rated allowed DC current for a period of 5 minutes
Withstanding Voltage Test	After test, inductor shall be no evidence of electrical and mechanical damage	AC voltage of 1000V AC applied between inductor terminals and case for 1 minute
Insulation Resistance Test	100M Ohm Min.	100 VDC applied between inductor terminal and case.

**MECHANICAL PERFORMANCE TEST**

ITEM	SPECIFICATION	TEST CONDITION / TEST METHOD
Vibration Test (Low Frequency)	1. Inductor shall be no evidence of electrical and mechanical damage 2. Inductance shall not change more than ±5% 3. Q shall not change more than ±20%	1. Amplitude: 1.5 mm 2. Frequency: 10 - 55 - 10 Hz / Min. 3. Direction: X, Y, Z 4. Duration: 2 Hrs / X, Y, Z
Shock Test	1. Inductor shall be no evidence of electrical and mechanical damage 2. Inductance shall not change more than ±5% 3. Q shall not change more than ±20%	Inductors shall be dropped 10 times from a height of 1m onto 3 cm wooden board
Resistance to Soldering Heat	1. Inductor shall be no evidence of electrical and mechanical damage 2. Inductance shall not change more than ±5% 3. Q shall not change more than ±20%	Temp.: 260±5°C Time: 10±1.0 Sec
Terminal Strength-Pull Test	Terminal shall not be loosened or ruptured	A 1kg load shall be applied to both terminals in the axis direction for 1 minute
Solderability test	The terminal shall be at least 90% covered with solder	After fluxing, inductor shall be dipped in a molten solder bath at 230±5°C for 5 sec
Resistance to Solvent Test	There shall be no case deformation change in appearance or obliteration of marking	MIL-STD-202F, Method 215D

## CLIMATIC TEST

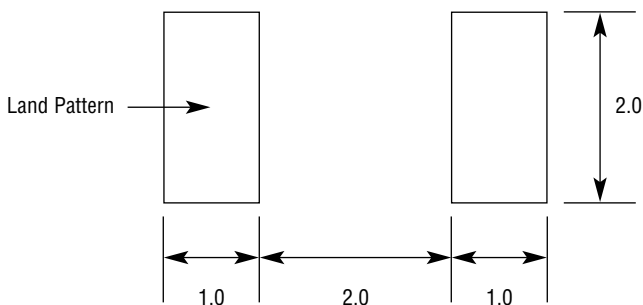
ITEM	SPECIFICATION	TEST CONDITION / TEST METHOD
Temperature Characteristic	<ol style="list-style-type: none"> <li>Inductor shall be no evidence of electrical and mechanical damage</li> <li>Inductance shall not change more than <math>\pm 10\%</math></li> <li>Q shall not change more than <math>\pm 20\%</math></li> </ol>	-25°C to 85°C  <ol style="list-style-type: none"> <li>Temp.: 40<math>\pm 2</math>°C</li> <li>RH: 95%</li> <li>Time: 96<math>\pm 2</math> hours</li> </ol>
Cold Test	<ol style="list-style-type: none"> <li>Inductor shall be no evidence of electrical and mechanical damage</li> <li>Inductance shall not change more than <math>\pm 10\%</math></li> <li>Q shall not change more than <math>\pm 20\%</math></li> </ol>	<ol style="list-style-type: none"> <li>Temp.: -25<math>\pm 2</math>°C</li> <li>Time: 16 hours</li> </ol>
Thermal Shock Test	<ol style="list-style-type: none"> <li>Inductor shall be no evidence of electrical and mechanical damage</li> <li>Inductance shall not change more than <math>\pm 10\%</math></li> <li>Q shall not change more than <math>\pm 20\%</math></li> </ol>	Room Temp → -25 $\pm 2$ °C 15 Mins → 30 Mins  Room Temp → 85 $\pm 2$ °C 15 Mins → 30 Mins  Total: 5 cycles
Dry Heat Test	<ol style="list-style-type: none"> <li>Inductor shall be no evidence of electrical and mechanical damage</li> <li>Inductance shall not change more than <math>\pm 10\%</math></li> <li>Q shall not change more than <math>\pm 20\%</math></li> </ol>	<ol style="list-style-type: none"> <li>Temp.: 85<math>\pm 2</math>°C</li> <li>Time: 16 hours</li> </ol>
High Temperature Load Life Test	There shall be no evidence of short or open circuiting	<ol style="list-style-type: none"> <li>Temp.: 85<math>\pm 2</math>°C</li> <li>Time: 1000<math>\pm 12</math> hours</li> <li>Load: Allowed DC current</li> </ol>
Humidity Load Test	There shall be no evidence of short or open circuiting	<ol style="list-style-type: none"> <li>Temp.: 85<math>\pm 2</math>°C</li> <li>RH: 90 - 95%</li> <li>Time: 1000<math>\pm 12</math> hours</li> <li>Load: Allowed DC current</li> </ol>

NOTE: Unless otherwise specified, allow the specimen to stand at room temperature for 1 hour or more but not more than 2 hours, measure the electrical and mechanical performances.

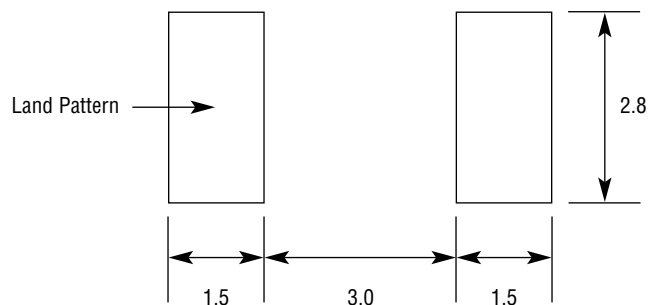
## RECOMMENDED SOLDER PAD LAYOUT

Dimensions in mm.

### SMI-322522 (1210)

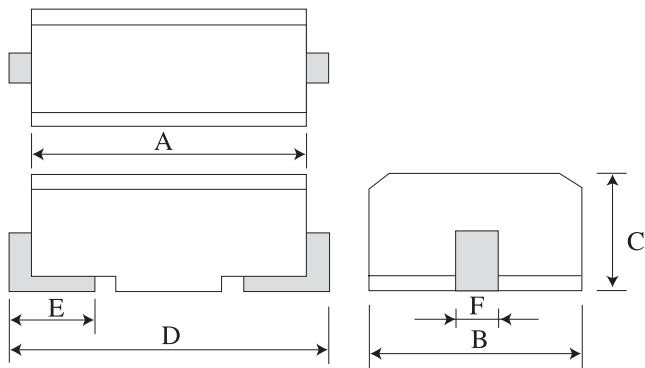


### SMI-453232 (1812)



Dimensions are listed for recommendation only. Final land pattern to be determined by design engineer.

## PRODUCT DIMENSIONS



A:  $4.5 \pm 0.3$

B:  $3.2 \pm 0.2$

C:  $3.2 \pm 0.2$

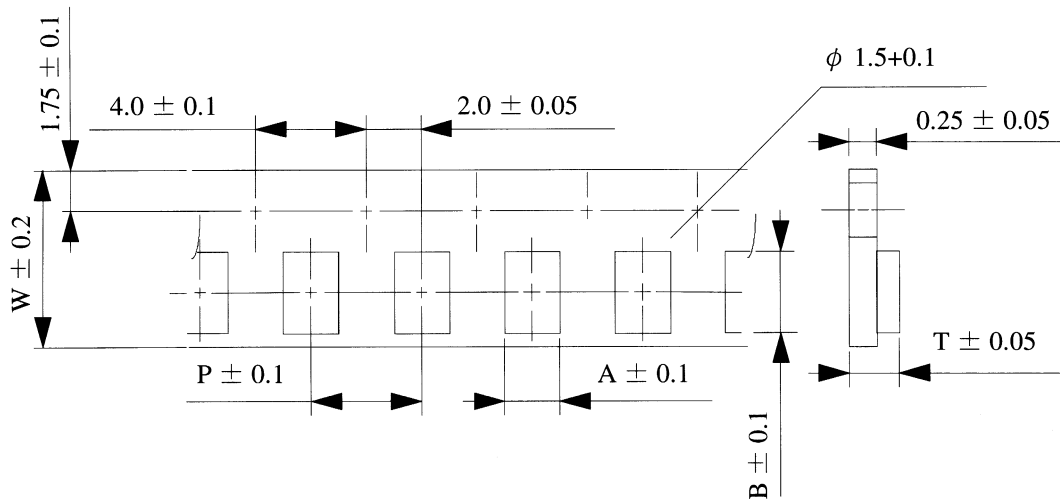
D:  $4.2 \pm 0.2$

E:  $1.0 \pm 0.1$

F:  $1.2 \pm 0.1$

in mm

## CARRIER TAPE DIMENSIONS



## PACKAGING QUANTITY

Dimensions in mm

TYPE	A	B	W	P	T	CHIPS/REEL	
SMI-453232	3.69	4.9	12	8	3.6	500	