



### ● PART NUMBERING

EM-

(1) (2) (3) (4) (5) (6)

- (1) Series
- (2) Inductance
- (3) Tolerance
- (4) Dimension
- (5) Material
- (6) Internal Serial No.

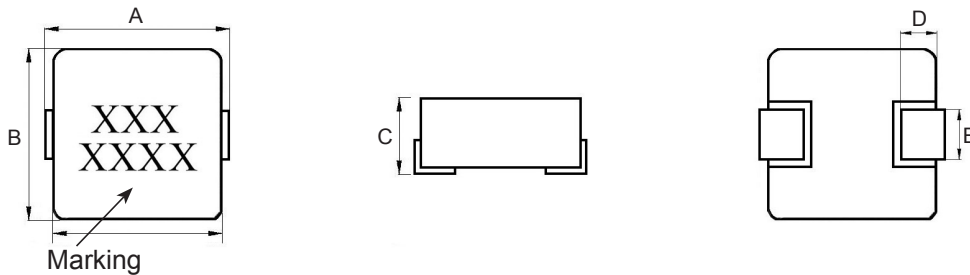
### ● FEATURES

- Molding type SMD inductor with metal alloy powder construction.
- Small footprint and low profile design.
- Large current and low DCR.
- Small copper loss design.
- Magnetic shielded, suitable for high density mounting.

### ● APPLICATIONS

- Laptops, desktops, and servers
- GPSs
- Communication devices
- VGA cards
- DC/DC converters
- VRMs

### ● CONFIGURATIONS & DIMENSIONS



Unit : mm

SERIES	A	B	C	D	E
EM-01V	4.50 Max.	4.0±0.2	2.0 Max.	0.8±0.3	1.5±0.3
EM-27V	4.80 Max.	4.0±0.2	1.2 Max.	1.0±0.3	2.0±0.3
EM-02V	5.20 Max.	4.7±0.2	3.0 Max.	1.0±0.3	1.5±0.3
EM-21V	6.00 Max.	5.2±0.2	1.2 Max.	1.0±0.3	2.0±0.3
EM-22V	6.00 Max.	5.2±0.2	1.5 Max.	1.0±0.3	2.0±0.3
EM-23V	6.00 Max.	5.2±0.2	2.0 Max.	1.0±0.3	2.0±0.3
EM-25V	6.00 Max.	5.2±0.2	3.0 Max.	1.0±0.3	2.0±0.3
EM-29V	7.40 Max.	6.6±0.2	1.5 Max.	1.6±0.3	3.0±0.3
EM-03V	7.40 Max.	6.6±0.2	1.8 Max.	1.6±0.3	3.0±0.3
EM-04V	7.40 Max.	6.6±0.2	2.4 Max.	1.6±0.3	3.0±0.3
EM-05V	7.40 Max.	6.6±0.2	3.0 Max.	1.6±0.3	3.0±0.3
EM-18V	7.40 Max.	6.6±0.2	4.0 Max.	1.6±0.3	3.0±0.3
EM-06V	7.40 Max.	6.6±0.2	5.0 Max.	1.6±0.3	3.0±0.3
EM-34V	8.30 Max.	7.0±0.3	5.0 Max.	2.0±0.5	3.0±0.5

Customers' designs and requirements are welcome.

**● ELECTRICAL CHARACTERISTICS**

<b>SERIES</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
EM-20V	10.5 Max.	6.8±0.2	5.0 Max.	2.0±0.3	3.0±0.3
EM-19V	11.5 Max.	10.0±0.3	2.4 Max.	2.0±0.5	3.0±0.5
EM-07V	11.5 Max.	10.0±0.3	3.0 Max.	2.0±0.5	3.0±0.5
EM-08V	11.5 Max.	10.0±0.3	4.0 Max.	2.0±0.5	3.0±0.5
EM-09V	11.5 Max.	10.0±0.3	5.0 Max.	2.0±0.5	3.0±0.5
EM-11V	13.8 Max.	12.6±0.3	3.5 Max.	2.0±0.5	3.0±0.5
EM-13V	13.8 Max.	12.6±0.3	5.0 Max.	2.0±0.5	3.0±0.5
EM-17V	13.8 Max.	12.6±0.3	6.5 Max.	2.0±0.5	3.0±0.5

• For packaging information, please refer to page P.208

## ● ELECTRICAL CHARACTERISTICS

New Part No.	Old Part No.	L ( $\mu$ H)	DCR ( $\Omega$ , Max.)		Isat (A, Max.)	I <sub>rms</sub> (A, Max.)
			Typ.	Max.		
EM-10B□01V□□	MSG0420-R10□	0.10	4.5	5.0	32	11
EM-22B□01V□□	MSG0420-R22□	0.22	7.3	8.0	24	9.0
EM-47B□01V□□	MSG0420-R47□	0.47	16	18	11.5	5.6
EM-10A□01V□□	MSG0420-1R0□	1.0	33	37	8.5	3.75
EM-22A□01V□□	MSG0420-2R2□	2.2	40	45	6.0	3.25
EM-33A□01V□□	MSG0420-3R3□	3.3	53	60	5.0	2.85
EM-47B□27V□□	MSG4212-R47□	0.47	18.3	21.0	8.0	6.0
EM-68B□27V□□	MSG4212-R68□	0.68	30.6	34.0	6.0	5.0
EM-10A□27V□□	MSG4212-1R0□	1.0	41.8	47.0	5.2	4.2
EM-15A□27V□□	MSG4212-1R5□	1.5	51.6	55.0	4.5	4.0
EM-22A□27V□□	MSG4212-2R2□	2.2	77.6	83.5	3.5	2.75
EM-10A□02V□□	MSG0530-1R0□	1.0	13	14	11	7.0
EM-15A□02V□□	MSG0530-1R5□	1.5	20	25	10	6.0
EM-22A□02V□□	MSG0530-2R2□	2.2	29	35	9.0	5.0
EM-33A□02V□□	MSG0530-3R3□	3.3	32	38	7.0	4.0
EM-47A□02V□□	MSG0530-4R7□	4.7	60	65	5.0	3.5
EM-56A□02V□□	MSG0530-5R6□	5.6	65	70	4.5	3.2
EM-22B□21V□□	MSG5512-R22□	0.22	7.0	7.7	11.0	10
EM-10A□21V□□	MSG5512-1R0□	1.00	33.0	37.0	6.0	5.0
EM-15A□21V□□	MSG5512-1R5□	1.50	40.5	45.0	4.5	4.0
EM-22A□21V□□	MSG5512-2R2□	2.20	80.4	90.0	3.3	3.0
EM-47A□21V□□	MSG5512-4R7□	4.70	118.0	131.0	2.5	2.3
EM-12B□22V□□	MSG5515-R12□	0.12	2.9	3.3	21	18
EM-30B□22V□□	MSG5515-R30□	0.30	5.6	6.0	15	13
EM-47B□22V□□	MSG5515-R47□	0.47	6.9	7.6	13	11
EM-68B□22V□□	MSG5515-R68□	0.68	10.6	12.0	10	9
EM-10A□22V□□	MSG5515-1R0□	1.00	19.8	23.0	8	6
EM-22A□22V□□	MSG5515-2R2□	2.20	38.0	42.0	5	4
EM-20B□23V□□	MSG5520-R20□	0.20	1.8	2.0	25	20
EM-22B□23V□□	MSG5520-R22□	0.22	3.8	4.2	20	16
EM-33B□23V□□	MSG5520-R33□	0.33	5.7	6.3	15	12
EM-47B□23V□□	MSG5520-R47□	0.47	7.0	7.7	14	11
EM-68B□23V□□	MSG5520-R68□	0.68	9.0	10.0	11	9
EM-10A□23V□□	MSG5520-1R0□	1.00	16.6	18.1	7.7	7
EM-22A□23V□□	MSG5520-2R2□	2.20	33.0	37.0	6.5	5
EM-33A□23V□□	MSG5520-3R3□	3.30	40.3	45.0	5	4
EM-47A□23V□□	MSG5520-4R7□	4.70	74.0	83.0	4	3
EM-68A□23V□□	MSG5520-6R8□	6.80	126	150	2.6	2.3

- All test data is referenced to 25°C ambient
- Inductance test frequency at 100KHz, 1V<sub>rms</sub>.
- $\Delta T = 40^\circ\text{C}$  approximately at I<sub>rms</sub>.
- Inductance drop approximately 30% at Isat.
- Operating temperature Range:  $-55^\circ\text{C}$  to  $+105^\circ\text{C}$

## ● ELECTRICAL CHARACTERISTICS

New Part No.	Old Part No.	L ( $\mu$ H)	DCR ( $\Omega$ , Max.)		Isat (A, Max.)	Irms (A, Max.)
			Typ.	Max.		
EM-22B□25V□□	MSG5530-R22□	0.22	1.8	2.0	25	20
EM-33B□25V□□	MSG5530-R33□	0.33	2.4	2.7	20	16
EM-47B□25V□□	MSG5530-R47□	0.47	4.5	5.2	15	13
EM-68B□25V□□	MSG5530-R68□	0.68	8.3	9.2	12	10
EM-10A□25V□□	MSG5530-1R0□	1.00	12.3	15.0	11	9
EM-22A□25V□□	MSG5530-2R2□	2.20	21.3	24.0	8	6
EM-33A□25V□□	MSG5530-3R3□	3.30	32.8	37.0	7	5
EM-47A□25V□□	MSG5530-4R7□	4.70	42.0	48.0	5	4
EM-22B□29V□□	MSG0615-R22□	0.22	4.5	5	16	14
EM-33B□29V□□	MSG0615-R33□	0.33	5.6	6.3	14	12
EM-47B□29V□□	MSG0615-R47□	0.47	7.8	8.5	12	9
EM-68B□29V□□	MSG0615-R68□	0.68	12.4	14.5	10	8
EM-10A□29V□□	MSG0615-1R0□	1.00	20.5	23	8	6
EM-22A□29V□□	MSG0615-2R2□	2.20	40.0	44	6	5
EM-33A□29V□□	MSG0615-3R3□	3.30	48.0	53	5	4
EM-47A□29V□□	MSG0615-4R7□	4.70	86.0	94	4	3.3
EM-68A□29V□□	MSG0615-6R8□	6.80	132	150	3.5	3
EM-100□29V□□	MSG0615-100□	10.0	164	180	3	2
EM-10B□03V□□	MSG0618-R10□	0.10	2.1	2.5	40	18
EM-15B□03V□□	MSG0618-R15□	0.15	4.7	5.2	35	15
EM-22B□03V□□	MSG0618-R20□	0.20	5.3	5.7	30	14
EM-33B□03V□□	MSG0618-R33□	0.33	6.6	7.0	20	12
EM-47B□03V□□	MSG0618-R47□	0.47	8.4	9.3	18	11
EM-68B□03V□□	MSG0618-R68□	0.68	12.7	13.9	17	9
EM-82B□03V□□	MSG0618-R82□	0.82	13.8	15.9	16	8
EM-10A□03V□□	MSG0618-1R0□	1.0	17.5	18.3	14	6
EM-15A□03V□□	MSG0618-1R5□	1.5	32.6	34.0	11	4
EM-22A□03V□□	MSG0618-2R2□	2.2	40.3	46.0	10	3.75
EM-33A□03V□□	MSG0618-3R3□	3.3	56.2	60.1	9	3.25
EM-47A□03V□□	MSG0618-4R7□	4.7	76.6	80.2	8	3

- All test data is referenced to 25°C ambient
- Inductance test frequency at 100KHz, 1Vrms.
- $\Delta T = 40^\circ\text{C}$  approximately at Irms.
- Inductance drop approximately 30% at Isat.
- Operating temperature Range:  $-55^\circ\text{C}$  to  $+105^\circ\text{C}$

## ● ELECTRICAL CHARACTERISTICS

New Part No.	Old Part No.	L ( $\mu$ H)	DCR ( $\Omega$ , Max.)		Isat (A, Max.)	Irms (A, Max.)
			Typ.	Max.		
EM-10B□04V□□	MSG0624-R10□	0.1	1.5	1.7	50	30
EM-22B□04V□□	MSG0624-R22□	0.22	2.9	3.2	35	21
EM-33B□04V□□	MSG0624-R33□	0.33	3.7	4.1	22	18
EM-47B□04V□□	MSG0624-R47□	0.47	6.0	6.5	20	13.5
EM-68B□04V□□	MSG0624-R68□	0.68	8.7	9.4	18	11
EM-82B□04V□□	MSG0624-R82□	0.82	10.6	11.8	17	10
EM-10A□04V□□	MSG0624-1R0□	1.0	13.1	14.2	16	9.0
EM-15A□04V□□	MSG0624-1R5□	1.5	18.5	21.2	15	7.5
EM-22A□04V□□	MSG0624-2R2□	2.2	28.0	34.0	14	6.5
EM-33A□04V□□	MSG0624-3R3□	3.3	36.5	51.6	13	5.0
EM-47A□04V□□	MSG0624-4R7□	4.7	45.2	63.0	10	4.5
EM-68A□04V□□	MSG0624-6R8□	6.8	72.5	95.0	9	3.5
EM-82A□04V□□	MSG0624-8R2□	8.2	84.2	106	8	3.0
EM-100□04V□□	MSG0624-100□	10.0	115.6	129.0	7	2.5
EM-10B□05V□□	MSG0630-R10□	0.10	0.9	1.2	60	30
EM-20B□05V□□	MSG0630-R20□	0.20	2.4	3.0	42	24
EM-33B□05V□□	MSG0630-R33□	0.33	3.5	3.9	32	20
EM-47B□05V□□	MSG0630-R47□	0.47	4.0	4.3	28	18
EM-68B□05V□□	MSG0630-R68□	0.68	5.0	5.5	26	15
EM-82B□05V□□	MSG0630-R82□	0.82	6.7	8	24	13
EM-10A□05V□□	MSG0630-1R0□	1.0	9.0	10	22	11
EM-15A□05V□□	MSG0630-1R5□	1.5	14	15	18	9
EM-22A□05V□□	MSG0630-2R2□	2.2	18	20	15	8
EM-33A□05V□□	MSG0630-3R3□	3.3	28	30	13	6
EM-47A□05V□□	MSG0630-4R7□	4.7	37	40	10	5
EM-68A□05V□□	MSG0630-6R8□	6.8	54	60	8	4.5
EM-82A□05V□□	MSG0630-8R2□	8.2	64	70	7.5	4
EM-100□05V□□	MSG0630-100□	10.0	102	105	7	3
EM-15B□18V□□	MSG0640-R15□	0.15	0.72	0.8	45	36
EM-22B□18V□□	MSG0640-R22□	0.22	1.13	1.24	35	30
EM-33B□18V□□	MSG0640-R33□	0.33	1.70	1.9	30	25
EM-47B□18V□□	MSG0640-R47□	0.47	3.4	3.9	20	16
EM-68B□18V□□	MSG0640-R68□	0.68	5.3	6.2	18	14
EM-10A□18V□□	MSG0640-1R0□	1.0	9.6	11.5	15	12
EM-15A□18V□□	MSG0640-1R5□	1.5	11.5	13.8	12	10
EM-22A□18V□□	MSG0640-2R2□	2.2	14.5	17.4	11	8.5
EM-33A□18V□□	MSG0640-3R3□	3.3	16.3	19.5	10	8
EM-47A□18V□□	MSG0640-4R7□	4.7	13	13.6	10	8
EM-68A□18V□□	MSG0640-6R8□	6.8	13	13.6	10	8

## ● ELECTRICAL CHARACTERISTICS

New Part No.	Old Part No.	L ( $\mu$ H)	DCR ( $\Omega$ , Max.)		Isat (A, Max.)	Irms (A, Max.)
			Typ.	Max.		
EM-56B□06V□□	MSG0650-R56□	0.56	3.4	3.6	20	18
EM-68B□06V□□	MSG0650-R68□	0.68	4.2	4.5	18	15
EM-10A□06V□□	MSG0650-1R0□	1.0	5.6	6.5	15	13
EM-15A□06V□□	MSG0650-1R5□	1.5	8.6	9.0	12	11
EM-22A□06V□□	MSG0650-2R2□	2.2	13	13.6	10	8
EM-220□06V□□	MSG0650-220□	220	112	123	3.5	3
EM-15B□34V□□	MSG0750-R15□	0.15	0.64	0.72	45	32
EM-33B□34V□□	MSG0750-R33□	0.33	1.26	1.42	35	30
EM-10A□34V□□	MSG0750-1R0□	1.00	3.85	4.3	15	15
EM-15A□34V□□	MSG0750-1R5□	1.50	5.10	5.8	11	10
EM-68A□34V□□	MSG0750-6R8□	6.80	22.0	25	6	5
EM-150□34V□□	MSG0750-150□	15.0	52.1	60	5	4
EM-30B□20V□□	MSG0850-R33□	0.30	0.92	1.1	35	30
EM-68B□20V□□	MSG0850-R68□	0.68	4.20	5.0	20	16
EM-36B□19V□□	MSG1024-R36□	0.36	1.65	1.98	32	25
EM-10A□19V□□	MSG1024-1R0□	1.0	5.0	6.0	18	15
EM-47A□19V□□	MSG1024-4R7□	4.7	28	33.6	8	6
EM-36B□07V□□	MSG1030-R36□	0.36	1.3	1.5	50	25
EM-47B□07V□□	MSG1030-R47□	0.47	2.1	2.5	40	20
EM-10A□07V□□	MSG1030-1R0□	1.0	5.3	6.0	25	13
EM-33A□07V□□	MSG1030-3R3□	3.3	13	15.6	16	10
EM-47A□07V□□	MSG1030-4R7□	4.7	19	22.0	13	8
EM-100□07V□□	MSG1030-100□	10	50	55.0	10	5
EM-36B□08V□□	MSG1040-R36□	0.36	1.1	1.30	60	30
EM-45B□08V□□	MSG1040-R45□	0.45	1.1	1.30	30	28
EM-47B□08V□□	MSG1040-R47□	0.47	1.6	1.80	55	25
EM-56B□08V□□	MSG1040-R56□	0.56	1.8	2.20	50	22
EM-68B□08V□□	MSG1040-R68□	0.68	2.4	2.70	42	20
EM-10A□08V□□	MSG1040-1R0□	1.0	3.5	4.10	36	18
EM-15A□08V□□	MSG1040-1R5□	1.5	4.5	5.20	32	16
EM-22A□08V□□	MSG1040-2R2□	2.2	6.9	7.80	27	12
EM-33A□08V□□	MSG1040-3R3□	3.3	9.5	11.8	21	10
EM-47A□08V□□	MSG1040-4R7□	4.7	15.0	16.5	17	9
EM-68A□08V□□	MSG1040-6R8□	6.8	21.2	23.3	13.5	7.5
EM-100□08V□□	MSG1040-100□	10	27.5	30.0	12	6
EM-150□08V□□	MSG1040-150□	15	48.0	52.8	9	4.5
EM-220□08V□□	MSG1040-220□	22	70.0	80.0	8	3.5

- All test data is referenced to 25°C ambient
- Inductance test frequency at 100KHz, 1Vrms.
- $\Delta T = 40^\circ\text{C}$  approximately at Irms.
- Inductance drop approximately 30% at Isat.
- Operating temperature Range:  $-55^\circ\text{C}$  to  $+105^\circ\text{C}$

## ● ELECTRICAL CHARACTERISTICS

New Part No.	Old Part No.	L ( $\mu$ H)	DCR ( $\Omega$ , Max.)		Isat (A, Max.)	Irms (A, Max.)
			Typ.	Max.		
EM-30B□09V□□	MSG1050-R30□	0.30	0.8	0.92	50	38
EM-47B□09V□□	MSG1050-R47□	0.47	0.9	1.08	45	35
EM-33A□09V□□	MSG1050-3R3□	3.3	7.0	8.40	16	14
EM-47A□09V□□	MSG1050-4R7□	4.7	10.5	12.6	12	10
EM-10B□11V□□	MSG1235-R10□	0.1	0.8	0.96	80	42
EM-22B□11V□□	MSG1235-R22□	0.22	1.1	1.3	65	38
EM-33B□11V□□	MSG1235-R33□	0.33	1.3	1.5	62	36
EM-47B□11V□□	MSG1235-R47□	0.47	1.7	2.0	55	32
EM-68B□11V□□	MSG1235-R68□	0.68	2.3	2.5	49	28
EM-10A□11V□□	MSG1235-1R0□	1.0	3.3	3.5	40	24
EM-15A□11V□□	MSG1235-1R5□	1.5	5.1	5.5	35	19
EM-22A□11V□□	MSG1235-2R2□	2.2	7.2	8.0	29	16
EM-33A□11V□□	MSG1235-3R3□	3.3	11.0	12.0	27	12
EM-47A□11V□□	MSG1235-4R7□	4.7	14.3	15.0	24	10
EM-68A□11V□□	MSG1235-6R8□	6.8	19.8	22.0	18	9
EM-100□11V□□	MSG1235-100□	10	30.4	34.0	14	7
EM-10B□13V□□	MSG1250-R10□	0.10	0.53	0.6	118	55
EM-36B□13V□□	MSG1250-R36□	0.36	0.85	1.1	75	40
EM-47B□13V□□	MSG1250-R47□	0.47	1.1	1.3	65	35
EM-68B□13V□□	MSG1250-R68□	0.68	1.5	1.7	55	30
EM-10A□13V□□	MSG1250-1R0□	1.0	2.1	2.5	50	25
EM-15A□13V□□	MSG1250-1R5□	1.5	3.4	4.1	40	20
EM-22A□13V□□	MSG1250-2R2□	2.2	4.6	5.5	35	16
EM-33A□13V□□	MSG1250-3R3□	3.3	7.7	9.2	30	14
EM-47A□13V□□	MSG1250-4R7□	4.7	12.8	15.0	25	12
EM-68A□13V□□	MSG1250-6R8□	6.8	15.4	18.5	20	10
EM-82A□13V□□	MSG1250-8R2□	8.2	18.9	22.5	18	9
EM-100□13V□□	MSG1250-100□	10	21.4	25.5	16	8
EM-150□13V□□	MSG1250-150□	15	35.2	38.7	14	7
EM-220□13V□□	MSG1250-220□	22	65.5	72.2	10	6
EM-330□13V□□	MSG1250-330□	33	76.3	86.0	7	4.5

- All test data is referenced to 25°C ambient
- Inductance test frequency at 100KHz, 1Vrms.
- $\Delta T = 40^\circ\text{C}$  approximately at Irms.
- Inductance drop approximately 30% at Isat.
- Operating temperature Range:  $-55^\circ\text{C}$  to  $+105^\circ\text{C}$

## ● ELECTRICAL CHARACTERISTICS

New Part No.	Old Part No.	L ( $\mu$ H)	DCR ( $\Omega$ , Max.)		Isat (A, Max.)	Irms (A, Max.)
			Typ.	Max.		
EM-10B□17V□□	MSG1265-R10□	0.1	0.47	0.52	120	60
EM-36B□17V□□	MSG1265-R36□	0.36	0.83	0.96	80	45
EM-47B□17V□□	MSG1265-R47□	0.47	1.0	1.3	70	40
EM-68B□17V□□	MSG1265-R68□	0.68	1.4	1.6	60	35
EM-10A□17V□□	MSG1265-1R0□	1.0	1.7	2.0	50	30
EM-15A□17V□□	MSG1265-1R5□	1.5	2.5	3.1	42	25
EM-22A□17V□□	MSG1265-2R2□	2.2	3.5	4.2	40	22
EM-33A□17V□□	MSG1265-3R3□	3.3	5.7	6.8	35	18
EM-47A□17V□□	MSG1265-4R7□	4.7	9.5	11.3	30	15
EM-68A□17V□□	MSG1265-6R8□	6.8	13.2	14.3	20	11
EM-82A□17V□□	MSG1265-8R2□	8.2	14.5	15.5	18	10
EM-100□17V□□	MSG1265-100□	10	16.5	17.5	16	9
EM-150□17V□□	MSG1265-150□	15	30	36	12	8
EM-220□17V□□	MSG1265-220□	22	40	48	10	6
EM-330□17V□□	MSG1265-330□	33	76	85	8	5
EM-470□17V□□	MSG1265-470□	47	110	121	6	4
EM-680□17V□□	MSG1265-680□	68	158	174	5	3

- All test data is referenced to 25°C ambient
- Inductance test frequency at 100KHz, 1Vrms.
- $\Delta T = 40^\circ\text{C}$  approximately at Irms.
- Inductance drop approximately 30% at Isat.
- Operating temperature Range:  $-55^\circ\text{C}$  to  $+105^\circ\text{C}$