

MP SERIES

**FEATURES: GENERAL PURPOSE SCREW TERMINAL
TYPE. RECOMMENDED FOR USE IN TELE-
COMMUNICATIONS AND INDUSTRIAL SYSTEMS**

ENDURANCE: +85°C, FOR 2000 Hrs

**REFERENCE
STANDARDS: IS4317/ IEC 384-4**

**PRODUCT
MARKING**

**PROVIDED WITH GREEN COLOUR
SLEEVE AND BLACK PRINT**

1. SPECIFICATIONS

PARAMETERS.	PERFORMANCE CHARACTERISTICS																																																
Operating Temperature	- 40°C to +85°C for WV ≤ 250 Vdc & -25°C to +85°C for WV > 250 Vdc.																																																
Working Voltage	16 Vdc to 450 Vdc																																																
Capacitance Range	220 µF to 5,60,000µF at +27° C, 100 Hz																																																
Capacitance Tolerance	± 20%																																																
Leakage Current (After 5mt charging through 1000 Ω resistor) IL in µA	$IL \leq 3 \sqrt{CV}$ Where IL = Leakage current in µA C= Capacitance (µF), V= Working Voltage in Volt Note: For C ≤ 2500µF, the charging resistor for R= 1000Ω For C > 2500µF, the charging resistor R = 2.5 /C																																																
Dissipation factor (Tan δ) Max (To be measured in four wire Kelvin clip terminal Method)	Tan δ at +27°C, 100 Hz in percentage <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>WV in Volts</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100-250</th> <th>350-450</th> </tr> </thead> <tbody> <tr> <td>∅ 35</td> <td>55</td> <td>40</td> <td>35</td> <td>30</td> <td>25</td> <td>15</td> <td>10</td> </tr> <tr> <td>∅ 50</td> <td>70</td> <td>50</td> <td>40</td> <td>30</td> <td>25</td> <td>15</td> <td>12</td> </tr> <tr> <td>∅ 63</td> <td>85</td> <td>65</td> <td>50</td> <td>35</td> <td>30</td> <td>20</td> <td>15</td> </tr> <tr> <td>∅ 76</td> <td>110</td> <td>75</td> <td>75</td> <td>55</td> <td>50</td> <td>30</td> <td>15</td> </tr> <tr> <td>∅ 90</td> <td>150</td> <td>100</td> <td>90</td> <td>75</td> <td>60</td> <td>30</td> <td>20</td> </tr> </tbody> </table>	WV in Volts	16	25	35	50	63	100-250	350-450	∅ 35	55	40	35	30	25	15	10	∅ 50	70	50	40	30	25	15	12	∅ 63	85	65	50	35	30	20	15	∅ 76	110	75	75	55	50	30	15	∅ 90	150	100	90	75	60	30	20
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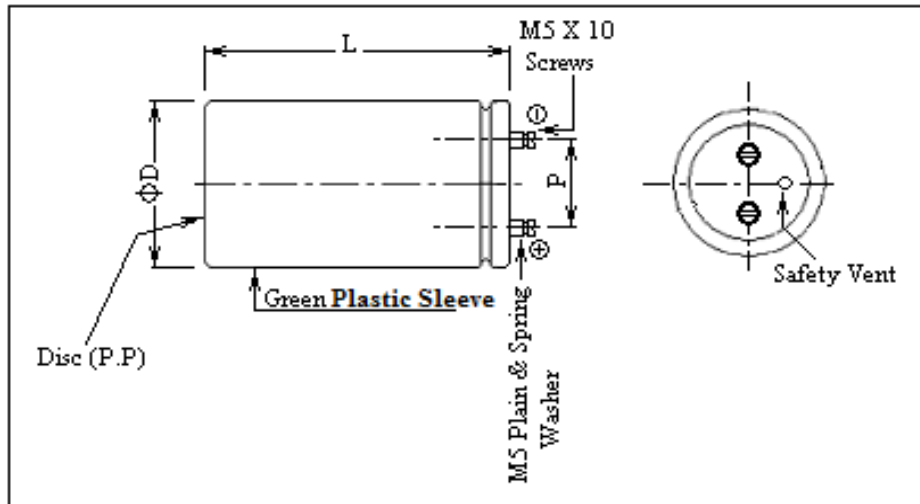
2. OTHER INFORMATION

Dimensional Specification	Refer page no.2 for details
Standard rating size, Ripple current, ESR and frequency multipliers	Refer page no.3&4for details
Capacitor Codification System	Refer page no. 5
Marking Specification	Refer page no. 7
Type of Packing and Lead Configuration	Bulk Packing – in cardboard cartons with separator. Provided with SCREW TYPE terminals for external connection For details refer section 9

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3. PHYSICAL OUT LINES – MP SERIES

Dimensions provided without sleeve. For sleeved dimensions add 1.0mm to the diameter and 2mm to the length of the capacitor.



All dimensions in mm

4. DIMENSIONS (All units in mm)

Case code	DH	DM	DQ	GM	GQ	HQ	HR	HT	JQ	JR	JT	JU	KT	KV
Diameter Ø D ± 2 (mm)	35	35	35	50	50	63	63	63	76	76	76	76	90	90
Length L ± 4 (mm)	60	80	105	80	105	105	120	146	105	120	146	175	146	200
Pitch P ± 0.5 (mm)	12.5	12.5	12.5	22	22	28.5	28.5	28.5	31.8	31.8	31.8	31.8	31.8	31.8

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5. STANDARD RATING TABLE

Provides detailed information regarding applicable case size, and the appropriate ripple current handling capability of the defined case size and the maximum ESR value at +27°C, +100Hz.

CAP	16 19			25 30			35 41			50 58			63 73			100 115		
	CC	RC	ESR	CC	RC	ESR	CC	RC	ESR	CC	RC	ESR	CC	RC	ESR	CC	RC	ESR
2200																DH	2.52	0.136
3300																DH DM	3.2 3.4	0.090
4700																DM DQ	3.68 3.87	0.064
5600													DH	3.0	0.089	DM	3.98	0.053
6800										DH	3.09	0.088	DH	3.20	0.073	DQ GM	4.46 4.85	0.044
8200										DH	3.68	0.073	DH	3.46	0.061	DQ GM	5.62 5.82	0.036
10000										DH GM	4.26 4.66	0.060	DM GM	3.88 4.17	0.050 0.070	DQ GM	6.12 6.2	0.030
12000										DH	5.24	0.050	DM	4.36	0.041	GQ	6.59	0.025
15000							DH	3.98	0.046	DM	5.43	0.040	DQ	5.24	0.033	GQ	8.34	0.020
18000				DH	4.85	0.044	DH	4.46	0.039	DM	5.63	0.033	DQ GM	5.82 6.20	0.028 0.039	GR HQ	8.73 8.92	0.017 0.022
22000				DH	5.24	0.036	DM	5.24	0.032	DQ	6.01	0.027	GM	6.79	0.032	HQ HR	9.9	0.018
27000	DH	4.85	0.041	DH	5.62	0.029	DM	5.92	0.026	GM	6.59	0.022	GQ	7.57	0.026	HQ HR	10.67 10.87	0.016 0.015
33000	DH	5.33	0.033	DH	5.82	0.024	DQ	6.79	0.021	GM	6.89	0.018	GQ GR	8.54 8.83	0.021	HT JR	11.65 11.84	0.012 0.018
39000	DH	6.20	0.028	DM	6.50	0.020	DQ	7.37	0.018	GQ	7.37	0.015	GR	9.70	0.018	JT	12.61	0.015
47000	DH	6.99	0.023	DM DQ	7.76 7.95	0.017	GM	8.74	0.017	GQ	7.95	0.013	HQ JQ	11.25 11.65	0.013 0.021	JU	14.56	0.013
56000	DM	7.76	0.020	DQ	8.15	0.014	GM	9.61	0.014	GR	9.12	0.011	HR	13.00	0.011	KV	16.49	0.011
68000	DM	8.92	0.016	DQ	8.73	0.012	GQ	10.67	0.012	HQ	10.86	0.010	HR	14.36	0.009	KV	18.44	0.009
82000	DQ	9.90	0.013	GM	9.70	0.012	GQ	11.84	0.010	HQ	12.03	0.008	HT JR	16.11 16.49	0.007 0.012			
100000	DQ	10.48	0.011	GM	10.67	0.010	GR	13.19	0.008	HR JR	13.78 14.36	0.007 0.011	JT	18.83	0.010			
120000	GM	10.77	0.013	GQ	12.23	0.008	HQ	13.58	0.008	HT JR	15.53 15.73	0.006 0.009	JU	21.35	0.008			
150000	GM	11.25	0.011	GR	13.39	0.007	HR	14.75	0.007	JT	18.24	0.007	KV	25.43	0.008			
180000	GQ	12.23	0.009	HQ	15.05	0.007	HT	16.31	0.006									
220000	GQ	13.49	0.007	HQ	16.69	0.006	JR	17.07	0.007									
270000	GR	14.56	0.006	HT	17.86	0.005	JT	20.57	0.006									
330000	HQ	17.47	0.005	HT	19.60	0.004	JU	24.06	0.005									
390000	HR	18.44	0.004	JT	22.71	0.004	KV	26.79	0.005									
470000	HT	20.38	0.003	JU	23.88	0.003	KV	29.31	0.004									
560000	JR	21.31	0.004	JU	25.04	0.003												

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STANDARD RATING TABLE(Contd.)

WV SV	160			200			250			350			400			450		
	CC	RC	ESR	CC	RC	ESR	CC	RC	ESR	CC	RC	ESR	CC	RC	ESR	CC	RC	ESR
220																DH	1.73	0.905
270													DH	1.34	0.737	DH	2.01	0.737
330													DH	2.02	0.603	DH	2.21	0.603
390										DH	1.73	0.510	DH	2.21	0.510	DM	2.59	0.510
470										DH	1.91	0.423	DM	2.79	0.423	DM GM	2.76 2.98	0.423 0.508
560							DH	1.53	0.533	DM	2.30	0.355	DM	3.17	0.355	DQ	3.23	0.355
680				DH	1.64	0.439	DH	1.64	0.439	DM	2.79	0.293	DQ	3.46	0.293	DQ	3.55	0.293
820				DH	1.73	0.364	DH	1.74	0.364	DQ	3.17	0.243	DQ	3.95	0.243	GM	4.13	0.291
1000	DH	1.91	0.299	DH	2.11	0.299	DM	2.30	0.299	DQ	3.65	0.199	GM GQ	4.80 4.99	0.239 0.239	GM HQ	4.62 5.10	0.239 0.299
1200	DH	2.3	0.249	DM	2.40	0.249	DM	2.49	0.249	GM	4.04	0.199	GM	5.19	0.199	GQ	5.37	0.199
1500	DM	2.88	0.199	DM	2.79	0.199	DQ	3.06	0.199	GM	4.52	0.159	GQ	6.53	0.159	GR	6.53	0.159
1800	DM	3.26	0.166	DQ	3.07	0.166	GM	3.36	0.166	GQ	5.37	0.133	GR	7.30	0.133	HQ	7.10	0.166
2200	DQ	3.65	0.136	DQ	3.46	0.136	GM	3.75	0.136	GQ	6.35	0.109	HQ	8.46	0.136	HQ	8.46	0.136
2700	DQ	3.84	0.111	GM	3.95	0.111	GQ	4.52	0.111	HQ	7.31	0.111	HQ	9.68	0.111	HR	10.47	0.111
3300	GM	4.70	0.090	GQ	4.52	0.090	GQ	5.10	0.090	HR HQ	8.84 8.46	0.090 0.090	HR	11.63	0.090	HT	11.72	0.090
3900	GM	5.10	0.077	GQ	4.70	0.077	GR	5.77	0.077	HR	10.12	0.077	HT	13.27	0.077	JR	12.87	0.077
4700	GQ	5.57	0.064	GR HQ	6.15 6.35	0.064 0.085	HQ	7.01	0.085	HT	12.30	0.064	JT	15.57	0.064	JT JU	14.42 15.38	0.064 0.064
5600	GQ	6.35	0.053	HQ	6.83	0.071	HR	7.01	0.071	JR	13.65	0.053	JT	17.69	0.053	JU	18.07	0.053
6800	GR	7.30	0.044	HQ	7.30	0.059	HT	8.65	0.059	JT	15.38	0.044	JU JT	19.8 17.11	0.044	KV	21.53	0.059
8200	HQ	7.88	0.049	HR	8.46	0.049	JR	10.09	0.073	JU	17.49	0.036	KV	23.26	0.049			
10000	HR	9.23	0.040	HT	9.99	0.040	JT	11.54	0.060	KV	20.57	0.040						
12000	HT	10.38	0.033	JR	11.34	0.050	JU	13.65	0.050									
15000	JR	12.12	0.040	JU	13.07	0.040	KV	16.34	0.040									
18000	JT	14.03	0.033	KT	14.03	0.033												
22000	JU	16.16	0.027	KV	15.38	0.027												
33000	KV	18.65	0.018															

Abbreviations used:

WV : Working voltage of the capacitor in Volts.

Cap : Capacitance in microfarad.

RC : Maximum Ripple current allowed in ampere at 100Hz/ +85°C

SV : Surge voltage in volts.

CC : Case code.

ESR : Max ESR at 100Hz/ +27°C in Ohms.

Frequency Multiplier for Ripple Current

Voltage	Freq.					
	50	100	120	300	1K	10K or more
16-100	0.88	1	1.03	1.11	1.18	1.18
160-250	0.85	1	1.04	1.12	1.19	1.24

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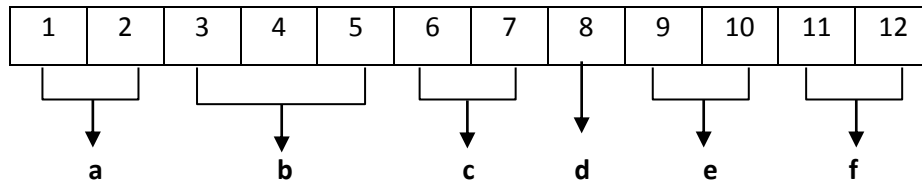
9. PACKING QUANTITY

MP Series capacitors are generally packed in PRIMARY cardboard cartons by employing suitable separators to avoid damage during transit. The primary cartons are then inserted into MOTHER cardboard cartons before shipment. Packing quantity in numbers per primary carton is detailed below.

Case Code	DH	DM	DQ	GM	GQ	HQ	HR	HT	JQ	JR	JT	JU	KT	KV	KW
Numbers per Primary Carton	81	81	81	36	36	25	25	25	16	16	16	12	12	9	-

CAPACITOR ORDERING INFORMATION FOR MP SERIES CAPACITORS

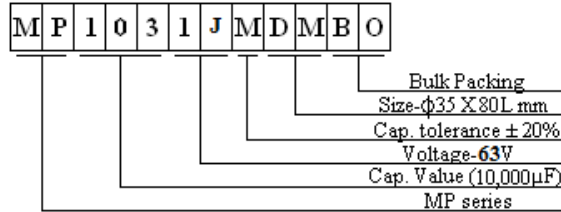
Capacitors are identified with the help of a 12-digit code. Expansions of Part Nos are identified below.



a						b							
Series Code						Capacitance Value Code							
MP – Large can screw terminal type						Indicates Cap. Value in microfarad Eg (i) 47µF is coded as 470 (ii) 470 µF is coded as 471 (iii) 4700µF is coded as 472							
C													
Voltage Code													
Working Voltage (V)	16	25	35	50	63	100	160	200	250	350	400	420	450
Code	1C	1E	1V	1H	1J	2A	2C	2D	2E	2V	2G	2U	2W
d				e					f				
Capacitance Tolerance Code				Size Code					Packing Code				
A - Special tolerance				DH-KV for MP Capacitors. For details refer to the corresponding dimension section.					BO – Bulk Packing				
M - ± 20%													
K - ± 10%													
N - ± 30%													

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Example (m)MP Series 10,000µF/ 63V
Screw terminal type



MARKING ON THE CAPACITOR FOR MP SERIES CAPACITORS

Product information is printed on the Plastic sleeve.MP capacitors are provided with green color sleeve. The following information’s are marked on the capacitor.

- a) Manufacturer’s name & logo
- b) Capacitor series and upper category temperature
- c) Nominal capacitance value in µF
- d) Capacitance tolerance in %
- e) Rated working voltage in V
- f) Date code (Year - Month)
- g) Negative terminals are indicated in the sleeve.

Date Code for MP series capacitors:

Date code is provided on the capacitor sleeve in Year – Month format. The details are as given below.

Year code

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Letter Code	M	N	P	R	S	T	U	V	W	X

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Letter Code	A	B	C	D	E	F	H	J	K	L

Year codes repeats after each cycle of 20 years.

Month code

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sep.	Oct.	Nov	Dec.
Code	1	2	3	4	5	6	7	8	9	O	N	D