



# MTR

- MKT • axial terminals • small size • general purpose



## Main applications

Blocking, filtering, bypassing, timing, coupling, decoupling, general applications in electronics. Low AC voltage motor running. Low pulse operation

## Dielectric

Polyester

## Electrodes

Vacuum deposited metal layers

## Coating

UL 510 / CSA TIL I-26 polyester tape wrapping; UL 94 V-0 resin end fill. Flame retardant execution

## Construction

Extended metallized film (refer to general technical information). Internal series connection for  $U \geq 1000Vdc$ . Non inductive type

## Terminals

Tinned copper wire (Lead free)

## Reference standard

IEC 60384/2, IEC 60068, RoHS compliant

## Climatic category

55/100/56 (IEC 60068/1), FME (DIN 40040)

## Operating temperature range (case)

-55°...+105°C

## Nominal Capacitance (Cn) µF

0,01µF to 150µF, In compliance with IEC 60063, E6 series. Refer to article table

## Capacitance tolerance (at 1kHz)

±10% (code=K), ±5% (code=J), ±20% (code=M). Other tolerances upon request.

## Capacitance temperature coefficient

Refer to General Technical Information

## Long term stability (at 1kHz)

Capacitance variation  $\leq \pm 2\%$  for  $C_n > 0,1\mu F$ ;  $\leq \pm 3\%$  for  $C_n \leq 0,1\mu F$  after a period of 2 years at standard environmental conditions

## Rated voltage (Ur)

63, 100, 250, 400, 630, 1000 Vdc

## Permissible AC voltage at 60Hz (Vac)

40, 63, 160, 200, 220, 400 Vac

## Category voltage (Uc)

$U_c = U_r$  at +85°C;  $U_c = 0,8xU_r$  at +100°C

## Temperature derated voltage

For  $T > +85^\circ$   $U_r$  must be decreased 1,25% for every °C exceeding +85°C

## Self inductance

$\leq 1nH/mm$  of capacitor and leads length used for connection

## Maximum pulse rise time V/µs

Refer to article table. The pulse characteristic  $K_o$  depends on the voltage waveform. In any case the value given in the article table must not be exceeded

## Dissipation factor (DF), max.

$tg\delta \times 10^{-4}$ , measured at 25 ±5°C

Freq.	$C_n \leq 0.1 \mu F$	$0.1 \mu F < C_n \leq 1 \mu F$	$1 \mu F < C_n \leq 68 \mu F$	$C_n > 68 \mu F$
1kHz	80	80	100	110
10kHz	150	150	-	-
100kHz	300	-	-	-

## Insulation resistance (R<sub>INS</sub>)

Measured between terminals, at 25±5°C, after 1 minute of electrification at 100Vdc for  $U_r \geq 100Vdc$  and 50Vdc for  $U_r < 100Vdc$

$U_r$	$C_n$	$R_{INS}$
$\leq 100$	$\leq 0.33 \mu F$	$\geq 3750 M\Omega$
$> 100$	$\leq 0.33 \mu F$	$\geq 30000 M\Omega$
$\leq 100$	$> 0.33 \mu F$	$\geq 1250 s$
$> 100$	$> 0.33 \mu F$	$\geq 10000 s$

## Test voltage between terminals (Ut)

1,6xUr (DC) applied for 2s at 25±5°C (1 minute for type test)

## Damp heat test (steady state)

List of admitted high humidity and temperature tests (please refer to paragraph C10 of the GTI)

Test ID	Reference	Permissible
a	Damp heat test (steady state) not biased - IEC60068	YES
b	Damp heat test (steady state) biased - AEC Q-200 cockpit	NO
c	Robustness under high humidity, Grade II - IEC 60384-17:2019	NO
d	High robustness under high humidity, Grade III - IEC 60384-17:2019	NO
e	Damp heat test (steady state) biased - 70/70/1000	NO
f	Humidity load test, Test Cy, Severity II- IEC 60068-2-67	NO
g	Humidity load test, Test Cy, Severity III - IEC 60068-2-67 and 85/85/1000 Level 1 - AEC Q-200	NO

## Performance:

Capacitance change  $\leq \pm 5\%$   
DF change  $\leq 0.0050$  at 1kHz  
 $R_{INS} \geq 50\%$  of initial limit value

## Endurance test

### Test conditions:

Temperature= +85±2°C  
Test duration= 2000h  
Voltage applied=1,25xUr(DC)

### Performance:

Capacitance change  $\leq \pm 5\%$   
DF change  $\leq 0.0050$  at 10kHz for  $C_n \leq 1\mu F$   
DF change  $\leq 0.0030$  at 1kHz for  $C_n > 1\mu F$   
 $R_{INS} \geq 50\%$  of initial limit value

## Resistance to soldering heat test

### Test conditions:

Solder bath temperature= +260±5°C  
Dipping time (with heat screen)= 10±1s

### Performance:

Capacitance change  $\leq \pm 2\%$   
DF change  $\leq 0.0050$  at 10kHz for  $C_n \leq 1\mu F$   
DF change  $\leq 0.0030$  at 1kHz for  $C_n > 1\mu F$   
 $R_{INS} \geq 50\%$  of initial limit value

## Reliability (MIL HDB 217)

### Application conditions:

Applied voltage= 0,5 x Ur(DC)  
Temperature= +40±2°C

### Failure rate: (1FIT=1x10<sup>-9</sup> failures/components x hours)

$\leq 5FIT$  for all the values

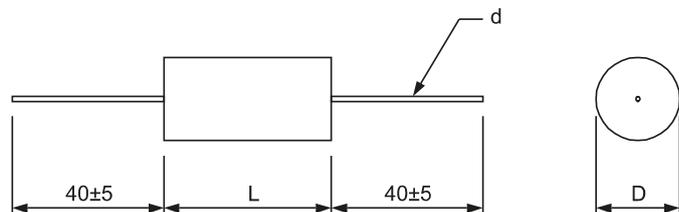
### Failure criteria (DIN44122):

Capacitance change  $> \pm 10\%$   
DF change  $> 2 \times$  initial value  
 $R_{INS} < 0,005 \times$  initial limit value  
Short or open circuit



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Dimensional tolerances (mm)

L	L±	D±
10.5	1.0	1.0
13.0	1.5	1.0
19.0	1.5	1.5
27.0	2.0	2.0
32.0	2.0	2.0
44.0	2.5	2.5

MTR article table (different values available upon request)

Voltage at +85°C		Cn μF	Dimensions (mm)			du/dt V/μs	K <sub>0</sub> V <sup>2</sup> /μs	ICEL CODE <sup>(1)</sup> -
Ur (Vdc)	Urms (Vac)		D	L	d			
63	40	0,68	5	13	0,6	6	756	MTR0633680*B
63	40	1	6	13	0,6	6	756	MTR0634100*B
63	40	1,5	7	13	0,6	6	756	MTR0634150*B
63	40	2,2	6,5	19	0,6	3	380	MTR0634220*D
63	40	3,3	8	19	0,8	3	380	MTR0634330*D
63	40	4,7	9,5	19	0,8	3	380	MTR0634470*D
63	40	6,8	11	19	0,8	3	380	MTR0634680*D
63	40	10	10,5	27	0,8	2	252	MTR0635100*G
63	40	15	13	27	0,8	2	252	MTR0635150*G
63	40	22	15,5	27	0,8	2	252	MTR0635220*G
63	40	33	17,5	32	1	1	125	MTR0635330*J
63	40	47	20,5	32	1	1	125	MTR0635470*J
63	40	68	20,5	44	1	1	125	MTR0635680*N
63	40	100	25	44	1	1	125	MTR0636100*N
63	40	150	30,5	44	1	1	125	MTR0636150*N
100	63	0,68	6	13	0,6	9	1800	MTR1103680*B
100	63	1	7	13	0,6	9	1800	MTR1104100*B
100	63	1,5	8,5	13	0,8	9	1800	MTR1104150*B
100	63	1,5	6,5	19	0,6	5	1000	MTR1104150*D
100	63	2,2	8	19	0,8	5	1000	MTR1104220*D
100	63	3,3	9,5	19	0,8	5	1000	MTR1104330*D
100	63	4,7	11,5	19	0,8	5	1000	MTR1104470*D
100	63	6,8	11	27	0,8	3	600	MTR1104680*G
100	63	10	13,5	27	0,8	3	600	MTR1105100*G
100	63	10	12	32	0,8	2	400	MTR1105100*J
100	63	15	14,5	32	0,8	2	400	MTR1105150*J
100	63	22	17,5	32	1	2	400	MTR1105220*J
100	63	33	21	32	1	2	400	MTR1105330*J
100	63	47	25	32	1	2	400	MTR1105470*J
100	63	47	21	44	1	1	200	MTR1105470*N
100	63	68	25,5	44	1	1	200	MTR1105680*N
100	63	100	30,5	44	1	1	200	MTR1106100*N
100	63	120	33,5	44	1	1	200	MTR1106120*N
250	160	0,22	6	13	0,6	20	10000	MTR1253220*B
250	160	0,33	7	13	0,6	20	10000	MTR1253330*B
250	160	0,47	8,5	13	0,8	20	10000	MTR1253470*B
250	160	0,47	6,5	19	0,6	12	6000	MTR1253470*D
250	160	0,68	7,5	19	0,8	12	6000	MTR1253680*D
250	160	1	9	19	0,8	12	6000	MTR1254100*D
250	160	1,5	11	19	0,8	12	6000	MTR1254150*D

<sup>(1)</sup> Change the \* symbol with the needed capacitance tolerance code: J=±5%, K=±10%, M=±20%

<sup>(2)</sup> Not suitable for across the line application



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Voltage at +85°C		Cn μF	Dimensions (mm)			du/dt V/μs	K <sub>0</sub> V <sup>2</sup> /μs	ICEL CODE <sup>(1)</sup> -
Ur (Vdc)	Urms (Vac)		D	L	d			
250	160	2,2	13	19	0,8	12	6000	MTR1254220*D
250	160	2,2	10,5	27	0,8	8	4000	MTR1254220*G
250	160	3,3	12,5	27	0,8	8	4000	MTR1254330*G
250	160	4,7	15	27	0,8	8	4000	MTR1254470*G
250	160	4,7	13	32	0,8	5	2500	MTR1254470*J
250	160	6,8	15,5	32	0,8	5	2500	MTR1254680*J
250	160	10	19	32	1	5	2500	MTR1255100*J
250	160	15	23	32	1	5	2500	MTR1255150*J
250	160	15	19,5	44	1	3,5	1750	MTR1255150*N
250	160	22	23	44	1	3,5	1750	MTR1255220*N
250	160	33	28,5	44	1	3,5	1750	MTR1255330*N
250	160	47	33,5	44	1	3,5	1750	MTR1255470*N
400	200	0,1	6	13	0,6	30	24000	MTR1403100*B
400	200	0,15	7	13	0,6	30	24000	MTR1403150*B
400	200	0,22	8,5	13	0,8	30	24000	MTR1403220*B
400	200	0,22	6,5	19	0,6	20	16000	MTR1403220*D
400	200	0,33	8	19	0,8	20	16000	MTR1403330*D
400	200	0,47	9,5	19	0,8	20	16000	MTR1403470*D
400	200	0,68	11,5	19	0,8	20	16000	MTR1403680*D
400	200	1	13	19	0,8	20	16000	MTR1404100*D
400	200	1	10,5	27	0,8	13	10400	MTR1404100*G
400	200	1,5	12,5	27	0,8	13	10400	MTR1404150*G
400	200	2,2	15	27	0,8	13	10400	MTR1404220*G
400	200	2,2	13,5	32	0,8	8,5	6800	MTR1404220*J
400	200	3,3	16	32	0,8	8,5	6800	MTR1404330*J
400	200	4,7	19,5	32	1	8,5	6800	MTR1404470*J
400	200	6,8	23,5	32	1	8,5	6800	MTR1404680*J
400	200	6,8	19,5	44	1	6	4800	MTR1404680*N
400	200	10	23,5	44	1	6	4800	MTR1405100*N
400	200	15	29	44	1	6	4800	MTR1405150*N
400	200	22	34,5	44	1	6	4800	MTR1405220*N
630	220 <sup>(2)</sup>	0,022	5,5	13	0,6	40	50400	MTR1632220*B
630	220 <sup>(2)</sup>	0,033	6	13	0,6	40	50400	MTR1632330*B
630	220 <sup>(2)</sup>	0,047	7	13	0,6	40	50400	MTR1632470*B
630	220 <sup>(2)</sup>	0,068	8,5	13	0,8	40	50400	MTR1632680*B
630	220 <sup>(2)</sup>	0,068	6,5	19	0,6	25	31500	MTR1632680*D
630	220 <sup>(2)</sup>	0,1	7,5	19	0,8	25	31500	MTR1633100*D
630	220 <sup>(2)</sup>	0,15	9	19	0,8	25	31500	MTR1633150*D
630	220 <sup>(2)</sup>	0,22	11	19	0,8	25	31500	MTR1633220*D
630	220 <sup>(2)</sup>	0,33	10,5	27	0,8	15	18900	MTR1633330*G
630	220 <sup>(2)</sup>	0,47	12	27	0,8	15	18900	MTR1633470*G
630	220 <sup>(2)</sup>	0,68	14,5	27	0,8	15	18900	MTR1633680*G
630	220 <sup>(2)</sup>	0,68	13	32	0,8	10	12600	MTR1633680*J
630	220 <sup>(2)</sup>	1	15,5	32	0,8	10	12600	MTR1634100*J
630	220 <sup>(2)</sup>	1,5	19	32	1	10	12600	MTR1634150*J
630	220 <sup>(2)</sup>	2,2	23	32	1	10	12600	MTR1634220*J
630	220 <sup>(2)</sup>	2,2	19	44	1	8	10080	MTR1634220*N
630	220 <sup>(2)</sup>	3,3	23	44	1	8	10080	MTR1634330*N
630	220 <sup>(2)</sup>	4,7	27,5	44	1	8	10080	MTR1634470*N
630	220 <sup>(2)</sup>	6,8	32,5	44	1	8	10080	MTR1634680*N

<sup>(1)</sup> Change the \* symbol with the needed capacitance tolerance code: J=±5%, K=±10%, M=±20%

<sup>(2)</sup> Not suitable for across the line application



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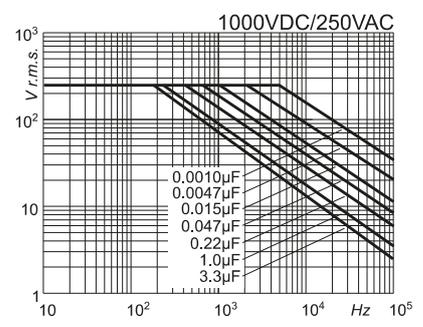
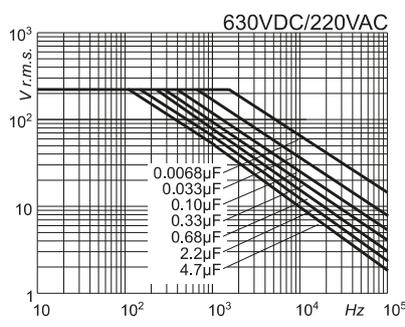
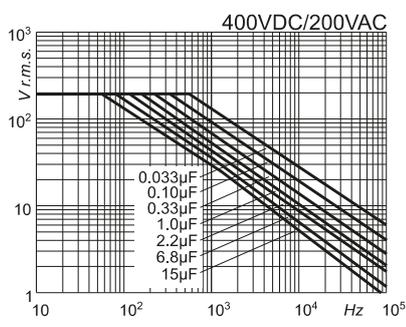
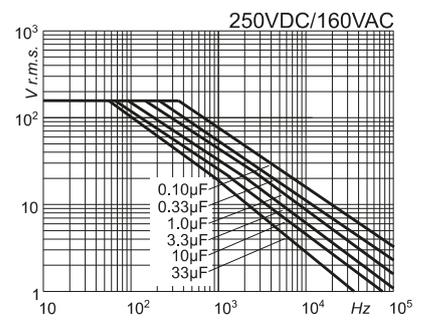
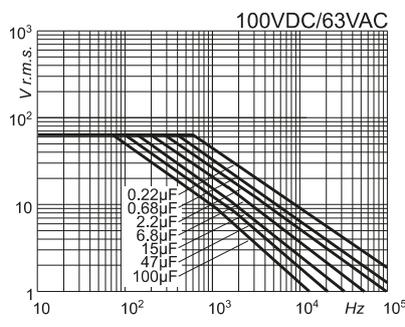
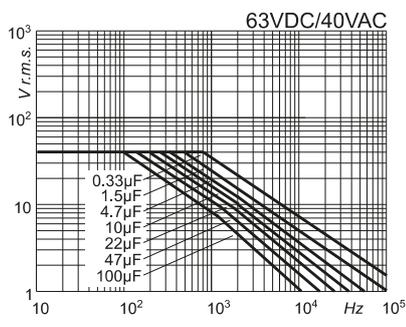


Voltage at +85°C		Cn μF	Dimensions (mm)			du/dt V/μs	K <sub>0</sub> V <sup>2</sup> /μs	ICEL CODE <sup>(1)</sup> -
Ur (Vdc)	Urms (Vac)		D	L	d			
1000	400 <sup>(2)</sup>	0,01	5,5	13	0,6	80	160000	MTR2102100*B
1000	400 <sup>(2)</sup>	0,015	6,5	13	0,6	80	160000	MTR2102150*B
1000	400 <sup>(2)</sup>	0,022	7	13	0,6	80	160000	MTR2102220*B
1000	400 <sup>(2)</sup>	0,033	8,5	13	0,8	80	160000	MTR2102330*B
1000	400 <sup>(2)</sup>	0,033	6,5	19	0,6	40	80000	MTR2102330*D
1000	400 <sup>(2)</sup>	0,047	7,5	19	0,8	40	80000	MTR2102470*D
1000	400 <sup>(2)</sup>	0,068	9	19	0,8	40	80000	MTR2102680*D
1000	400 <sup>(2)</sup>	0,1	11	19	0,8	40	80000	MTR2103100*D
1000	400 <sup>(2)</sup>	0,15	10	27	0,8	33	66000	MTR2103150*G
1000	400 <sup>(2)</sup>	0,22	12	27	0,8	33	66000	MTR2103220*G
1000	400 <sup>(2)</sup>	0,33	15	27	0,8	33	66000	MTR2103330*G
1000	400 <sup>(2)</sup>	0,33	13	32	0,8	20	40000	MTR2103330*J
1000	400 <sup>(2)</sup>	0,47	15	32	0,8	20	40000	MTR2103470*J
1000	400 <sup>(2)</sup>	0,68	18,5	32	1	20	40000	MTR2103680*J
1000	400 <sup>(2)</sup>	1	22	32	1	20	40000	MTR2104100*J
1000	400 <sup>(2)</sup>	1,5	22	44	1	15	30000	MTR2104150*N
1000	400 <sup>(2)</sup>	2,2	26,5	44	1	15	30000	MTR2104220*N
1000	400 <sup>(2)</sup>	3,3	32,5	44	1	15	30000	MTR2104330*N

<sup>(1)</sup> Change the \* symbol with the needed capacitance tolerance code: J=±5%, K=±10%, M=±20%

<sup>(2)</sup> Not suitable for across the line application

**Permissible AC voltage versus frequency (sinusoidal waveform) for ΔT=+10°C**  
Referred to the largest length execution among available ones



**Warning: this specification must be completed with the data given in the "General technical information" chapter**