



## Metallized Polyester Film Capacitors (MKT-S)

**Series/Type:**        **B32538**

The following products presented in this data sheet are being withdrawn.

Ordering Code	Substitute Product	Date of Withdrawal	Deadline Last Orders	Last Shipments
B32538*	B32537	2007-02-09	2007-03-31	2007-09-30

For further information please contact your nearest EPCOS sales office, which will also support you in selecting a suitable substitute. The addresses of our worldwide sales network are presented at [www.epcos.com/sales](http://www.epcos.com/sales).

**High reliability (wound)**
**Typical applications**

- Test and measurement equipment
- Rough environments

**Climatic**

- Max. operating temperature: 125 °C
- Climatic category (IEC 60068-1): 55/100/56

**Features**

- Optimum self-healing capability
- Excellent short circuit protection
- Very high reliability

**Construction**

- Dielectric: polyethylene terephthalate (polyester, PET)
- Construction with structured metallization
- Tubular winding
- Insulating sleeve
- Face ends sealed with epoxy resin

**Terminals**

- Central axial leads, lead-free tinned

**Marking**

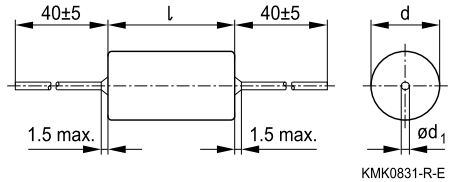
Manufacturer's logo,  
 style(MKT-S), rated capacitance (coded),  
 capacitance tolerance (code letter),  
 rated voltage, date of manufacture (coded)

**Delivery mode**

Bulk (untaped)

Taped (Ammo pack)

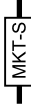
For notes on taping, refer to chapter "Taping and packing".

**Dimensional drawing**


Dimensions in mm

Diameter d	<7.8	7.8 ... 16	>16
Lead diameter d <sub>1</sub>	0.6	0.8	1.0

When bending leads take care to leave a clearance of 1 mm to the capacitor body.



**Overview of types**

Type	B32538				
$V_R$ (VDC)	50	100	160	250	630
$V_{rms}$ (VAC)	20	35	60	90	200
$C_R$ ( $\mu$ F)					
0.033					
0.047					
0.068					
0.10					
0.15					
0.22					
0.33					
0.47					
0.68					
1.0					
1.5					
2.2					
3.3					
4.7					
6.8					
10					
22					
47					
100					

**Ordering codes and packing units**

$V_R$	$V_{rms}$ $f \leq 60$ Hz	$C_R$	Max. dimensions $d \times l$ mm	Ordering code (composition see below)	Ammo pack pcs./unit	Untaped pcs./unit
VDC	VAC	$\mu F$				
50	20	0.47	6.1 × 16.0	B32538B5474+***	1100	50
		0.68	6.3 × 16.0	B32538B5684+***	1000	50
		1.0	6.9 × 16.0	B32538B5105+***	950	50
		1.5	7.6 × 16.0	B32538B5155+***	870	50
		2.2	7.4 × 20.0	B32538B5225+***	900	50
		3.3	8.2 × 20.0	B32538B5335+***	800	50
		4.7	9.3 × 20.0	B32538B5475+***	700	20
		6.8	10.8 × 20.0	B32538B5685+***	400	20
		10	12.6 × 20.0	B32538B5106+***	350	20
100	35	0.10	6.2 × 16.0	B32538B1104+***	1000	50
		0.15	6.4 × 16.0	B32538B1154+***	1000	50
		0.22	6.9 × 16.0	B32538B1224+***	950	50
		0.33	7.0 × 16.0	B32538B1334+***	950	50
		0.47	6.7 × 16.0	B32538B1474+***	950	50
		0.68	6.7 × 16.0	B32538B1684+***	950	50
		1.0	6.7 × 20.0	B32538B1105+***	950	50
		1.5	7.4 × 20.0	B32538B1155+***	900	50
		2.2	8.0 × 20.0	B32538B1225+***	800	50
		3.3	9.2 × 20.0	B32538B1335+***	700	20
		4.7	10.4 × 20.0	B32538B1475+***	400	20
		6.8	9.0 × 32.5	B32538B1685+***	700	20
		10	10.7 × 32.5	B32538B1106+***	400	20
		22	14.6 × 32.5	B32538B1226+***	PU on request	20
		47	20.2 × 32.5	B32538B1476+***	PU on request	20
		100	28.2 × 32.5	B32538B1107+***	PU on request	20

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:

M = ±20%

K = ±10%

\*\*\* = Packaging code:

007 = Ammo pack

000 = Untaped

**Ordering codes and packing units**

$V_R$	$V_{rms}$ $f \leq 60$ Hz VAC	$C_R$ $\mu F$	Max. dimensions $d \times l$ mm	Ordering code (composition see below)	Ammo pack pcs./unit	Untaped pcs./unit
160	60	0.10	$6.1 \times 16.0$	B32538B2104+***	1100	50
		0.15	$6.2 \times 16.0$	B32538B2154+***	1000	50
		0.22	$6.4 \times 16.0$	B32538B2224+***	1000	50
		0.33	$7.0 \times 16.0$	B32538B2334+***	950	50
		0.47	$6.9 \times 20.0$	B32538B2474+***	950	50
		0.68	$7.5 \times 20.0$	B32538B2684+***	870	50
		1.0	$8.3 \times 20.0$	B32538B2105+***	800	50
		1.5	$10.5 \times 20.0$	B32538B2155+***	400	20
		2.2	$11.0 \times 20.0$	B32538B2225+***	400	20
		3.3	$10.0 \times 32.5$	B32538B2335+***	450	20
		4.7	$11.3 \times 32.5$	B32538B2475+***	380	20
		6.8	$13.1 \times 32.5$	B32538B2685+***	PU on request	20
		10	$15.3 \times 32.5$	B32538B2106+***	PU on request	20
250	90	0.10	$6.7 \times 16.0$	B32538B3104+***	950	50
		0.15	$7.2 \times 16.0$	B32538B3154+***	900	50
		0.22	$7.3 \times 16.0$	B32538B3224+***	900	50
		0.33	$7.3 \times 20.0$	B32538B3334+***	900	50
		0.47	$8.0 \times 20.0$	B32538B3474+***	800	50
		0.68	$9.0 \times 20.0$	B32538B3684+***	700	20
		1.0	$10.3 \times 20.0$	B32538B3105+***	400	20
		1.5	$12.0 \times 20.0$	B32538B3155+***	380	20
		2.2	$14.0 \times 20.0$	B32538B3225+***	300	20
		3.3	$12.6 \times 32.5$	B32538B3335+***	350	20
		4.7	$14.5 \times 32.5$	B32538B3475+***	PU on request	20
		6.8	$17.0 \times 32.5$	B32538B3685+***	PU on request	20
		10	$20.1 \times 32.5$	B32538B3106+000	—	20

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:  
M =  $\pm 20\%$   
K =  $\pm 10\%$

\*\*\* = Packaging code:  
007 = Ammo pack  
000 = Untaped

**Ordering codes and packing units**

$V_R$	$V_{rms}$ $f \leq 60$ Hz	$C_R$	Max. dimensions $d \times l$ mm	Ordering code (composition see below)	Ammo pack pcs./unit	Untaped pcs./unit
VDC	VAC	$\mu F$				
630	200	0.033	$6.7 \times 16.0$	B32538B8333+***	950	50
		0.047	$7.3 \times 16.0$	B32538B8473+***	900	50
		0.068	$7.2 \times 20.0$	B32538B8683+***	900	50
		0.10	$7.9 \times 20.0$	B32538B8104+***	800	50
		0.15	$9.0 \times 20.0$	B32538B8154+***	700	20
		0.22	$10.5 \times 20.0$	B32538B8224+***	400	20
		0.33	$12.0 \times 20.0$	B32538B8334+***	380	20
		0.47	$13.9 \times 20.0$	B32538B8474+***	300	20
		0.68	$12.3 \times 32.5$	B32538B8684+***	350	20
		1.0	$14.3 \times 32.5$	B32538B8105+***	PU on request	20
		1.5	$17.0 \times 32.5$	B32538B8155+***	PU on request	20
		2.2	$20.0 \times 32.5$	B32538B8225+000	–	20
		3.3	$23.9 \times 32.5$	B32538B8335+000	–	20
4.7	$28.1 \times 32.5$	B32538B8475+000	–	20		

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:

M =  $\pm 20\%$

K =  $\pm 10\%$

\*\*\* = Packaging code:

007 = Ammo pack

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**Technical data**

Operating temperature range	Max. operating temperature $T_{op,max}$ +125 °C				
	Upper category temperature $T_{max}$ +100 °C				
	Lower category temperature $T_{min}$ -55 °C				
	Rated temperature $T_R$ +85 °C				
Dissipation factor $\tan \delta$ (in $10^{-3}$ ) at 20 °C (upper limit values)	$C_R$ ( $\mu$ F)	$\leq 0.47$	$0.47 < C_R \leq 4.7$	$4.7 < C_R \leq 10.0$	$> 10.0$
	at 1 kHz	7	8	8	10
	at 10 kHz	15	22	25	–
Insulation resistance $R_{ins}$ or time constant $\tau = C_R \cdot R_{ins}$ at 20 °C, rel. humidity $\leq 65\%$ (minimum as-delivered values)	$C_R$				
	$\leq 0.33 \mu$ F	$> 15000 \text{ M}\Omega$			
	$> 0.33 \mu$ F	$> 5000 \text{ s}$			
DC test voltage	$1.4 \cdot V_R, 2 \text{ s}$				
Category voltage $V_C$ (continuous operation with $V_{DC}$ or $V_{AC}$ at $f \leq 60 \text{ Hz}$ )	$T_A$ (°C)	DC voltage derating		AC voltage derating	
	$T_A \leq 85$ $85 < T_A \leq 100$	$V_C = V_R$ $V_C = V_R \cdot (165 - T_A)/80$		$V_{C,rms} = V_{rms}$ $V_{C,rms} = V_{rms} \cdot (165 - T_A)/80$	
Operating voltage $V_{op}$ for short operating periods ( $V_{DC}$ or $V_{AC}$ at $f \leq 60 \text{ Hz}$ )	$T_A$ (°C)	DC voltage (max. hours)		AC voltage (max. hours)	
	$T_A \leq 100$ $100 < T_A \leq 125$	$V_{op} = 1.25 \cdot V_C$ (2000 h) $V_{op} = 0.5 \cdot V_R$ (1000 h)		$V_{op} = 1.0 \cdot V_{C,rms}$ (2000 h) $V_{op} = 0.5 \cdot V_{rms}$ (1000 h)	
Damp heat test Limit values after damp heat test	56 days/40 °C/93% relative humidity				
	Capacitance change $ \Delta C/C $		$\leq 5\%$		
	Dissipation factor change $\Delta \tan \delta$		$\leq 5 \cdot 10^{-3}$ (at 1 kHz)		
	Insulation resistance $R_{ins}$		$\geq 50\%$ of minimum as-delivered values		
Reliability: Failure rate $\lambda$ Service life $t_{SL}$	1 fit ( $\leq 1 \cdot 10^{-9}/\text{h}$ ) at $0.5 \cdot V_R, 40 \text{ °C}$ 200 000 h at $1.0 \cdot V_R, 40 \text{ °C}$ For conversion to other operating conditions and temperatures, refer to chapter "Quality assurance", page .				
Failure criteria: Total failure Failure due to variation of parameters	Short circuit or open circuit				
	Capacitance change $ \Delta C/C $		$> 10\%$		
	Dissipation factor $\tan \delta$		$> 1.5 \cdot$ upper limit value		
	Insulation resistance $R_{ins}$ or time constant $\tau = C_R \cdot R_{ins}$		$< 150 \text{ M}\Omega$ ( $C_R \leq 0.33 \mu$ F) $< 50 \text{ s}$ ( $C_R > 0.33 \mu$ F)		

**Pulse handling capability**

"dV/dt" represents the maximum permissible voltage change per unit of time for non-sinusoidal voltages, expressed in V/ $\mu$ s.

"k<sub>0</sub>" represents the maximum permissible pulse characteristic of the waveform applied to the capacitor, expressed in V<sup>2</sup>/ $\mu$ s.

*Note:*

*The values of dV/dt and k<sub>0</sub> provided below must not be exceeded in order to avoid damaging the capacitor.*

**dV/dt values**

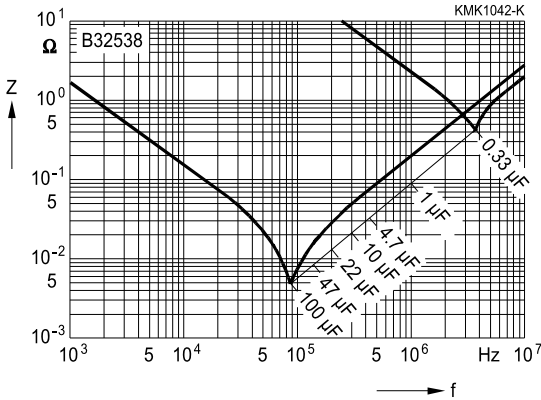
Length of capacitor		16 mm	20 mm	32.5 mm
V <sub>R</sub> VDC	V <sub>rms</sub> VAC	dV/dt in V/ $\mu$ s		
50	20	2.5	1.5	–
100	35	13	9	6
160	60	20	12	8
250	90	23	16	10
630	200	40	26	18

**k<sub>0</sub> values**

Length of capacitor		16 mm	20 mm	32.5 mm
V <sub>R</sub> VDC	V <sub>rms</sub> VAC	k <sub>0</sub> in V <sup>2</sup> / $\mu$ s		
50	20	250	150	–
100	35	2 600	1 800	1 200
160	60	6 400	3 840	2 560
250	90	11 500	8 000	5 000
630	200	50 400	32 800	22 700



**Impedance Z versus frequency f**  
(typical values)



**Permissible AC voltage  $V_{rms}$  versus frequency f**

Values can be obtained on request. In specific cases please provide a scaled voltage/ time graph and state operating conditions.