

Slim-Mox

Precision Thick Film Planar

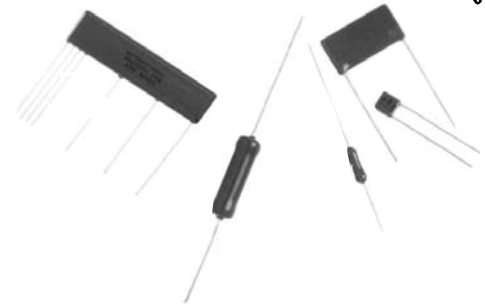


APPLICATIONS

- HV power supplies
- Medical instrumentation
- Current pulse limiters
- Ionization chambers

FEATURES

- High dielectric & low out-gassing epoxy coating
- Low resistor noise
- Non inductive
- RoHS compliant
- Radial terminals



SERIES SPECIFICATIONS

Ohmite Series	Resistance Range (Ohms)	Power @25°C	Max. Operating Voltage	Capacitance (pf)
SLIM-MOX10003	100Ω to 500M	0.25W	1.5KV	1.00
SLIM-MOX10103	100Ω to 1,000M	0.50W	2.0KV	1.00
SLIM-MOX10203	200Ω to 5,000M	1.00W	5.0KV	0.90
SLIM-MOX10303	250Ω to 5,000M	1.25W	7.5KV	0.75
SLIM-MOX10403	500Ω to 5,000M	1.50W	10.0KV	0.70
SLIM-MOX10603	750Ω to 5,000M	2.00W	15.0KV	0.65
SLIM-MOX10803	1K to 5,000M	2.50W	20.0KV	0.60
SLIM-MOX20203	500Ω to 5,000M	1.50W	5.0KV	1.10
SLIM-MOX20403	1K to 5,000M	2.00W	10.0KV	0.80
SLIM-MOX20603	2K to 5,000M	2.50W	15.0KV	0.75
SLIM-MOX20803	2K to 5,000M	3.00W	20.0KV	0.65
SLIM-MOX21003	3K to 5,000M	3.50W	25.0KV	0.60
SLIM-MOX30603	3K to 5,000M	3.50W	15.0KV	0.75
SLIM-MOX30803	4K to 5,000M	4.00W	20.0KV	0.50
SLIM-MOX31003	5K to 5,000M	4.50W	25.0KV	0.40
SLIM-MOX40403	3K to 5,000M	3.00W	10.0KV	1.00
SLIM-MOX40803	5K to 5,000M	5.00W	20.0KV	0.80
SLIM-MOX41003	5K to 5,000M	5.50W	25.0KV	0.50

Contact Ohmite for custom configurations. *Maximum voltage and power rating determined by Ohm's law: $P=V^2/R$

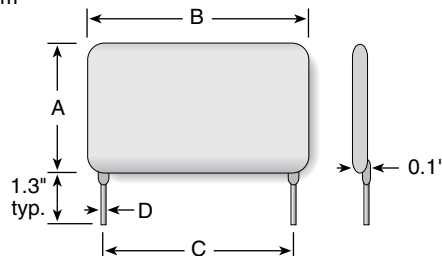
Ohmite's Slim-Mox provides stable performance for a wide range of resistance values, with voltage ratings up to 25K. Low temperature coefficients are available for high stability circuit applications. The space-saving planar package offers and alternative to traditional high voltage resistors.

CHARACTERISTICS

Resistor Element	Thick film on Alumina
Coating	Epoxy or Silicone
Terminals	RoHS solder composition is 96% Sn, 3.5% Ag, 0.5% Cu
Resistance Range	100 Ohms to 5,000M
Power Rating	0.25W to 5.5W
Voltage Rating	1.5KV to 25KV
Tolerance	0.5% to 20%; not all tolerances available in all values
Operating Temperature	-55°C to +110°C
Temperature Coefficient	See table

DIMENSIONS

in./mm



Series	Power @25°C	A max.	B max.	C ±0.025	D ±0.002
SLIM-MOX10003	0.25W	0.30" / 7.62	0.30" / 7.62	0.10" / 2.54	0.025" / 0.635
SLIM-MOX10103	0.50W	0.34" / 8.64	0.33" / 8.38	0.20" / 5.08	0.025" / 0.635
SLIM-MOX10203	1.00W	0.34" / 8.64	0.58" / 14.73	0.40" / 10.16	0.032" / 0.813
SLIM-MOX10303	1.25W	0.34" / 8.64	0.83" / 21.08	0.60" / 15.24	0.032" / 0.813
SLIM-MOX10403	1.50W	0.34" / 8.64	1.08" / 27.43	0.90" / 22.86	0.032" / 0.813
SLIM-MOX10603	2.00W	0.34" / 8.64	1.58" / 40.13	1.40" / 35.56	0.032" / 0.813
SLIM-MOX10803	2.50W	0.34" / 8.64	2.08" / 52.83	1.90" / 48.26	0.032" / 0.813
SLIM-MOX20203	1.50W	0.59" / 14.99	0.58" / 14.73	0.40" / 10.16	0.032" / 0.813
SLIM-MOX20403	2.00W	0.59" / 14.99	1.08" / 27.43	0.90" / 22.86	0.032" / 0.813
SLIM-MOX20603	2.50W	0.59" / 14.99	1.58" / 40.13	1.40" / 35.56	0.032" / 0.813
SLIM-MOX20803	3.00W	0.59" / 14.99	2.08" / 52.83	1.90" / 48.26	0.032" / 0.813
SLIM-MOX21003	3.50W	0.59" / 14.99	2.58" / 65.53	2.40" / 60.96	0.032" / 0.813
SLIM-MOX30603	3.50W	0.84" / 21.34	1.58" / 40.13	1.40" / 35.56	0.032" / 0.813
SLIM-MOX30803	4.00W	0.84" / 21.34	2.08" / 52.83	1.90" / 48.26	0.032" / 0.813
SLIM-MOX31003	4.50W	0.84" / 21.34	2.58" / 65.53	2.40" / 60.96	0.032" / 0.813
SLIM-MOX40403	3.00W	1.09" / 27.69	1.08" / 27.43	0.90" / 22.86	0.032" / 0.813
SLIM-MOX40803	5.00W	1.09" / 27.69	2.08" / 52.83	1.90" / 48.26	0.032" / 0.813
SLIM-MOX41003	5.50W	1.09" / 27.69	2.58" / 65.53	2.40" / 60.96	0.032" / 0.813

Slim-Mox Divider

Precision Thick Film Voltage



Multiple taps are provided on the Slim-Mox RD for use in advanced circuit designs. Tight ratio tolerances make these resistors ideal for precision applications requiring consistent performance.

FEATURES

- Custom configurations are available. Contact Ohmite with your specifications
- RoHS compliant

CHARACTERISTICS

Resistance range	1M to 5,000M ohms
Resistance ratio	100:1 - 5000 : 1 To specify dividers outside this range, please see our website at: https://www.ohmite.com/custom-resistor-divider/ A complete description of the SLIM-MOX Divider is required. EXAMPLE: R _T = 500MΩ 5% R ₁ = 499.5MΩ 5% R ₂ = 500KΩ 1% Ratio = R _T / R ₂ = 1,000: 1, 1%
Resistor element	Thick film on Alumina
Ratio tolerances	0.5% to 5%
Temperature Coefficient Tracking	TCR tracking to 10ppm and VCR tracking to 1ppm

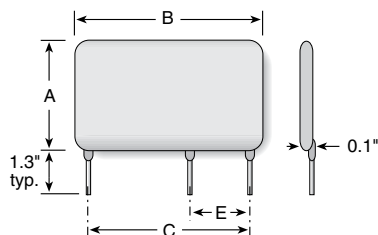
SERIES SPECIFICATIONS

Ohmite Series	Power @25°C	Operating Voltage
SLIM-MOX103RD	0.75W	5.0KV
SLIM-MOX104RD	1.00W	10.0KV
SLIM-MOX106RD	1.50W	12.0KV
SLIM-MOX108RD	2.00W	15.0KV
SLIM-MOX204RD	1.50W	10.0KV
SLIM-MOX206RD	2.00W	12.0KV
SLIM-MOX208RD	2.50W	20.0KV
SLIM-MOX210RD	3.00W	25.0KV
SLIM-MOX306RD	3.00W	12.0KV
SLIM-MOX308RD	3.50W	20.0KV
SLIM-MOX310RD	4.00W	25.0KV
SLIM-MOX408RD	4.50W	20.0KV
SLIM-MOX410RD	5.00W	25.0KV

Contact Ohmite for custom configurations.

DIMENSIONS

in. ±.025 /mm



Series	C	E
SLIM-MOX103RD	0.60"/ 15.24	0.20"/ 5.08
SLIM-MOX104RD	0.90"/ 22.86	0.20"/ 5.08
SLIM-MOX106RD	1.40"/ 35.56	0.20"/ 5.08
SLIM-MOX108RD	1.90"/ 48.26	0.60"/ 15.24
SLIM-MOX204RD	0.90"/ 22.86	0.20"/ 5.08
SLIM-MOX206RD	1.40"/ 35.56	0.20"/ 5.08
SLIM-MOX208RD	1.90"/ 48.26	0.40"/ 10.16
SLIM-MOX210RD	2.40"/ 60.96	0.20"/ 5.08
SLIM-MOX306RD	1.40"/ 35.56	0.30"/ 7.62
SLIM-MOX308RD	1.90"/ 48.26	0.30"/ 7.62
SLIM-MOX310RD	2.40"/ 60.96	0.20"/ 5.08
SLIM-MOX408RD	1.90"/ 48.26	0.30"/ 7.62
SLIM-MOX410RD	2.40"/ 60.96	0.20"/ 5.08

Slim-Mox HT

High Temperature Thick Film Precision

The Slim-Mox HT provides a higher power rating for high ambient temperature environments. Appropriate for mounting near heat generating components. The Slim-Mox HT is finished with a rugged silicone coating suitable for most environments.

SERIES SPECIFICATIONS

Ohmite Series	Resistance Range (Ohms)	Power @25°C	Voltage Rating
SLIM-MOX10002	100Ω to 500M	0.40W	1.5KV
SLIM-MOX10102	100Ω to 1,000M	0.75W	2.0KV
SLIM-MOX10202	200Ω to 5,000M	1.50W	5.0KV
SLIM-MOX10302	250Ω to 5,000M	2.00W	7.5KV
SLIM-MOX10402	500Ω to 5,000M	2.50W	10.0KV
SLIM-MOX10602	750Ω to 5,000M	3.25W	15.0KV
SLIM-MOX10802	1K to 5,000M	4.25W	20.0KV
SLIM-MOX20202	500Ω to 5,000M	2.50W	5.0KV
SLIM-MOX20402	1K to 5,000M	3.25W	10.0KV
SLIM-MOX20602	2K to 5,000M	4.25W	15.0KV
SLIM-MOX20802	2K to 5,000M	5.00W	20.0KV
SLIM-MOX21002	3K to 5,000M	5.75W	25.0KV
SLIM-MOX30602	3K to 5,000M	5.50W	15.0KV
SLIM-MOX30802	4K to 5,000M	6.75W	20.0KV
SLIM-MOX31002	5K to 5,000M	7.50W	25.0KV
SLIM-MOX40402	3K to 5,000M	5.00W	10.0KV
SLIM-MOX40802	5K to 5,000M	8.25W	20.0KV
SLIM-MOX41002	5K to 5,000M	9.00W	25.0KV

Contact Ohmite for custom configurations.

APPLICATIONS

- HV power supplies
- Medical instrumentation
- Current pulse limiters
- Ionization chambers

FEATURES

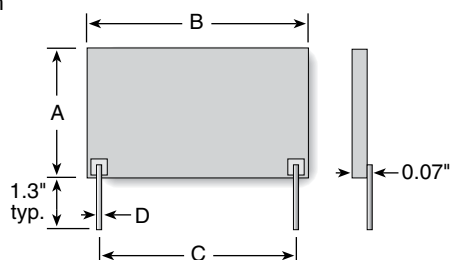
- Outstanding voltage coefficient
- High temperature silicone coating
- Low resistor noise
- Noninductive
- Custom configurations are available. Contact Ohmite with your specifications
- RoHS compliant
- Radial Terminals

CHARACTERISTICS

Resistor Element	Thick film on Alumina
Coating	Silicone
Resistance Range	100Ω to 5,000M
Power Rating	0.25W to 9.0W
Voltage Rating	1.5KV to 25KV
Tolerance	0.5% to 20%; not all tolerances available in all values
Operating Temperature	-55°C to +180°C

DIMENSIONS

in. /mm



Series	Power @25°C	A max.	B max.	C ±0.025	D ±0.002
SLIM-MOX10002	0.40W	0.20" / 5.08	0.20" / 5.08	0.10" / 2.54	0.025" / 0.635
SLIM-MOX10102	0.75W	0.25" / 6.35	0.25" / 6.35	0.20" / 5.08	0.025" / 0.635
SLIM-MOX10202	1.50W	0.25" / 6.35	0.50" / 12.70	0.40" / 10.16	0.032" / 0.813
SLIM-MOX10302	2.00W	0.25" / 6.35	0.75" / 19.05	0.60" / 15.24	0.032" / 0.813
SLIM-MOX10402	2.50W	0.25" / 6.35	1.00" / 25.40	0.90" / 22.86	0.032" / 0.813
SLIM-MOX10602	3.25W	0.25" / 6.35	1.50" / 38.10	1.40" / 35.56	0.032" / 0.813
SLIM-MOX10802	4.25W	0.25" / 6.35	2.00" / 50.80	1.90" / 48.26	0.032" / 0.813
SLIM-MOX20202	2.50W	0.50" / 12.70	0.50" / 12.70	0.40" / 10.16	0.032" / 0.813
SLIM-MOX20402	3.25W	0.50" / 12.70	1.00" / 38.10	0.90" / 22.86	0.032" / 0.813
SLIM-MOX20602	4.25W	0.50" / 12.70	1.50" / 38.10	1.40" / 35.56	0.032" / 0.813
SLIM-MOX20802	5.00W	0.50" / 12.70	2.00" / 50.80	1.90" / 48.26	0.032" / 0.813
SLIM-MOX21002	5.75W	0.50" / 12.70	2.50" / 63.50	2.40" / 60.96	0.032" / 0.813
SLIM-MOX30602	5.50W	0.75" / 19.05	1.50" / 38.10	1.40" / 35.56	0.032" / 0.813
SLIM-MOX30802	6.75W	0.75" / 19.05	2.00" / 50.80	1.90" / 48.26	0.032" / 0.813
SLIM-MOX31002	7.50W	0.75" / 19.05	2.50" / 63.50	2.40" / 60.96	0.032" / 0.813
SLIM-MOX40402	5.00W	1.00" / 25.40	1.00" / 25.40	0.90" / 22.86	0.032" / 0.813
SLIM-MOX40802	8.25W	1.00" / 25.40	2.00" / 50.80	1.90" / 48.26	0.032" / 0.813
SLIM-MOX41002	9.00W	1.00" / 25.40	2.50" / 63.50	2.40" / 60.96	0.032" / 0.813

Slim-Mox HT Divider

High Temperature Thick Film Voltage Divider

Slim-Mox HT RD resistor dividers complete the Slim-Mox family with the high temperature divider configuration. These resistors are useful wherever multiple voltage drops are needed in a circuit. Designed to customer specifications, the Slim-Mox HT RD resistor utilizes our thick film on alumina technology to offer flexible termination schemes.

FEATURES

- High Temperature Operation
- RoHS compliant
- Radial Terminals

CHARACTERISTICS

Resistance range	1M to 5,000M ohms
Resistance ratio	100:1 - 5000 : 1 To specify dividers outside this range, please see our website at: https://www.ohmite.com/custom-resistor-divider/ A complete description of the SLIM-MOX Divider is required. EXAMPLE: R _T = 500MΩ 5% R ₁ = 499.5MΩ 5% R ₂ = 500KΩ 1% Ratio = R _T / R ₂ = 1,000: 1, 1%
Resistor element	Thick film on Alumina
Ratio tolerances	0.5% to 5%
Temperature Coefficient Tracking	TCR tracking to 10ppm and VCR tracking to 1ppm

SERIES SPECIFICATIONS

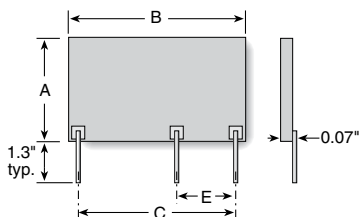
Ohmite Series	Power @25°C	Operating Voltage
SLIM-MOX103RD	1.25W	5.0KV
SLIM-MOX104RD	1.50W	10.0KV
SLIM-MOX106RD	2.50W	12.0KV
SLIM-MOX108RD	3.25W	15.0KV
SLIM-MOX204RD	2.50W	10.0KV
SLIM-MOX206RD	3.25W	12.0KV
SLIM-MOX208RD	4.25W	20.0KV
SLIM-MOX210RD	5.00W	25.0KV
SLIM-MOX306RD	4.50W	12.0KV
SLIM-MOX308RD	5.00W	20.0KV
SLIM-MOX310RD	5.75W	25.0KV
SLIM-MOX408RD	6.75W	20.0KV
SLIM-MOX410RD	7.50W	25.0KV

Contact Ohmite for custom configurations.

To specify Slim-Mox Dividers, please see our website at:
<https://www.ohmite.com/custom-resistor-divider/>

DIMENSIONS

in. ±0.025 /mm



Series	Power Rating	C	E
SLIM-MOX103RD	1.25W	0.60" / 15.24	0.20" / 5.08
SLIM-MOX104RD	1.50W	0.90" / 22.86	0.20" / 5.08
SLIM-MOX106RD	2.50W	1.40" / 35.56	0.20" / 5.08
SLIM-MOX108RD	3.25W	0.90" / 22.86	0.60" / 15.24
SLIM-MOX204RD	2.50W	0.90" / 22.86	0.20" / 5.08
SLIM-MOX206RD	3.25W	1.40" / 35.56	0.20" / 5.08
SLIM-MOX208RD	4.25W	1.90" / 48.26	0.40" / 10.16
SLIM-MOX210RD	5.00W	2.40" / 60.96	0.20" / 5.08
SLIM-MOX306RD	4.50W	1.40" / 35.56	0.30" / 7.62
SLIM-MOX308RD	5.00W	1.90" / 48.26	0.30" / 7.62
SLIM-MOX310RD	5.75W	2.40" / 60.96	0.20" / 5.08
SLIM-MOX408RD	6.75W	1.90" / 48.26	0.30" / 7.62
SLIM-MOX410RD	7.50W	2.40" / 60.96	0.20" / 5.08

(continued)

Slim-Mox

All products

TEMPERATURE/VOLTAGE COEFFICIENTS OF RESISTANCE

Resistor Series	Temp. Coeff. of Resistance*			Voltage Coeff. of Resistance**	
	0°C-85°C 25 PPM/°C	85°C-125°C 50 PPM/°C	125°C-155°C 100 PPM/°C	< 2PPM/Volt	< 5PPM/Volt
SLIM-MOX100	100 to 300M	100Ω to 50M	51M to 500M	100Ω to 140M	141M to 500M
SLIM-MOX101	100 to 800M	100Ω to 100M	101M to 1,000M	100Ω to 270M	271M to 1,000M
SLIM-MOX102	200 to 1,500M	200Ω to 250M	251M to 5,000M	200Ω to 640M	641M to 5,000M
SLIM-MOX103	250 to 800M	250Ω to 440M	441M to 5,000M	250Ω to 1,100M	1,101M to 5,000M
SLIM-MOX104	500 to 2,500M	500Ω to 450M	451M to 5,000M	500Ω to 1,100M	1,101M to 5,000M
SLIM-MOX106	750 to 5,000M	750Ω to 675M	676M to 5,000M	750Ω to 1,600M	1,601M to 5,000M
SLIM-MOX108	1K to 2,500M	1K to 375M	376M to 5,000M	1K to 940M	941M to 5,000M
SLIM-MOX202	500 to 1,500M	500Ω to 200M	201M to 5,000M	500Ω to 520M	521M to 5,000M
SLIM-MOX204	1K to 1,750M	1K to 375M	376M to 5,000M	1K to 950M	951M to 5,000M
SLIM-MOX206	2K to 4,500M	2K to 600M	601M to 5,000M	2K to 1,500M	1,501M to 5,000M
SLIM-MOX208	2K to 5,000M	2K to 1,000M	1,001M to 5,000M	2K to 2,500M	2,501M to 5,000M
SLIM-MOX210	3K to 5,000M	3K to 1,000M	1,001M to 5,000M	3K to 2,600M	2,601M to 5,000M
SLIM-MOX306	3K to 5,000M	3K to 1,000M	1,001M to 5,000M	3K to 2,600M	2,601M to 5,000M
SLIM-MOX308	4K to 5,000M	4K to 1,200M	1,201M to 5,000M	4K to 3,000M	3,001M to 5,000M
SLIM-MOX310	5K to 5,000M	5K to 1,500M	1,501M to 5,000M	5K to 4,000M	4,001M to 5,000M
SLIM-MOX404	3K to 5,000M	3K to 1,100M	1,101M to 5,000M	3K to 2,800M	2,801M to 5,000M
SLIM-MOX408	5K to 5,000M	5K to 1,250M	1,251M to 5,000M	5K to 3,000M	3,001M to 5,000M
SLIM-MOX410	5K to 5,000M	5K to 1,200M	1,201M to 5,000M	5K to 3,000M	3,001M to 5,000M
SLIM-MOX103RD	1M to 800M	1M to 70M	71M to 5,000M	1M to 185M	186M to 5,000M
SLIM-MOX104RD	1M to 2,500M	1M to 275M	276M to 5,000M	1M to 720M	721M to 5,000M
SLIM-MOX106RD	1M to 5,000M	1M to 250M	251M to 5,000M	1M to 640M	641M to 5,000M
SLIM-MOX108RD	1M to 2,500M	1M to 350M	351M to 5,000M	1M to 875M	876M to 5,000M
SLIM-MOX204RD	1M to 1,750M	1M to 300M	301M to 5,000M	1M to 750M	751M to 5,000M
SLIM-MOX206RD	1M to 4,500M	1M to 1,750M	1,751M to 5,000M	1M to 4,500M	4,501M to 5,000M
SLIM-MOX208RD	1M to 5,000M	1M to 625M	626M to 5,000M	1M to 1,550M	1,551M to 5,000M
SLIM-MOX210RD	1M to 5,000M	1M to 950M	951M to 5,000M	1M to 2,400M	2,401M to 5,000M
SLIM-MOX306RD	1M to 5,000M	1M to 800M	801M to 5,000M	1M to 2,000M	2,001M to 5,000M
SLIM-MOX308RD	1M to 5,000M	1M to 1,200M	1,201M to 5,000M	1M to 2,600M	2,601M to 5,000M
SLIM-MOX310RD	1M to 5,000M	1M to 1,000M	1,001M to 5,000M	1M to 3,900M	3,901M to 5,000M
SLIM-MOX408RD	1M to 5,000M	1M to 1,600M	1,601M to 5,000M	1M to 4,000M	4,001M to 5,000M
SLIM-MOX410RD	1M to 5,000M	1M to 1,200M	1,201M to 5,000M	1M to 3,000M	3,001M to 5,000M

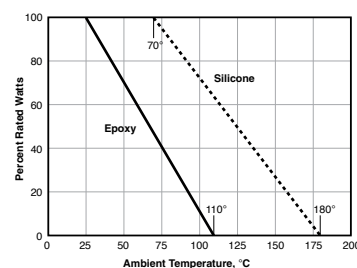
* Consult factory for TCR values operating higher than 125°C

**VC's of <2PPM/Volt are available. Contact Ohmite with your requirement.

PERFORMANCE DATA

Characteristic	Test Method	Specification
Humidity	MIL-STD-202, Method 103B, Condition B	±0.25%
Dielectric Withstanding Voltage	MIL-STD-202, Method 301, 750V	±0.25%
Insulation Resistance	MIL-STD-202, Method 302, Condition A or B	>10,000M or greater dry
Thermal Shock	MIL-STD-202, Method 107G, Condition B, B-1, or F	±0.20%
Load Life	MIL-STD-202, Method 108A, Condition D	±1.0%
Resistance to Solvents	MIL-STD-202, Method 215G	No degradation of coating or marking
Terminal Strength	MIL-STD-202, Method 211A, Condition A or B	±0.25%
Shock (Specified Pulse)	MIL-STD-202, Method 213B, Condition I	±0.25%
Vibration, High Frequency	MIL-STD-202, Method 204D, Condition D	±0.20%
Power Conditioning	MIL-R-49462A, Par 4.8	±0.50%
Solderability	MIL-STD-202, Method 208F	>95% Coverage

DERATING



ORDERING INFORMATION

Style	Coating	Tape & Reel	RoHS Compliant
100 to 410	2 = Blue silicone (high temp.) 3 = Epoxy (standard) 6 = No coating		
S M 1 0 2 0 3 1 0 0 6 F T E			
Slim Mox Series	Terminal 0 = 0.032" std. (for SM102 - 410) 0 = 0.025" std. (SM100 and 101)	Ohms First 3 digits are significant; 4th digit is multiplier (# of zeroes to follow). Examples: 1000 = 100Ω 1503 = 150,000Ω 5005 = 50,000,000Ω	Tolerance D = 0.5% F = 1% G = 2% J = 5% K = 10% M = 15% P = 20%

Not all tolerances available in all values.
To specify Slim-Mox Dividers, please see our website at:
<https://www.ohmite.com/custom-resistor-divider/>

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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