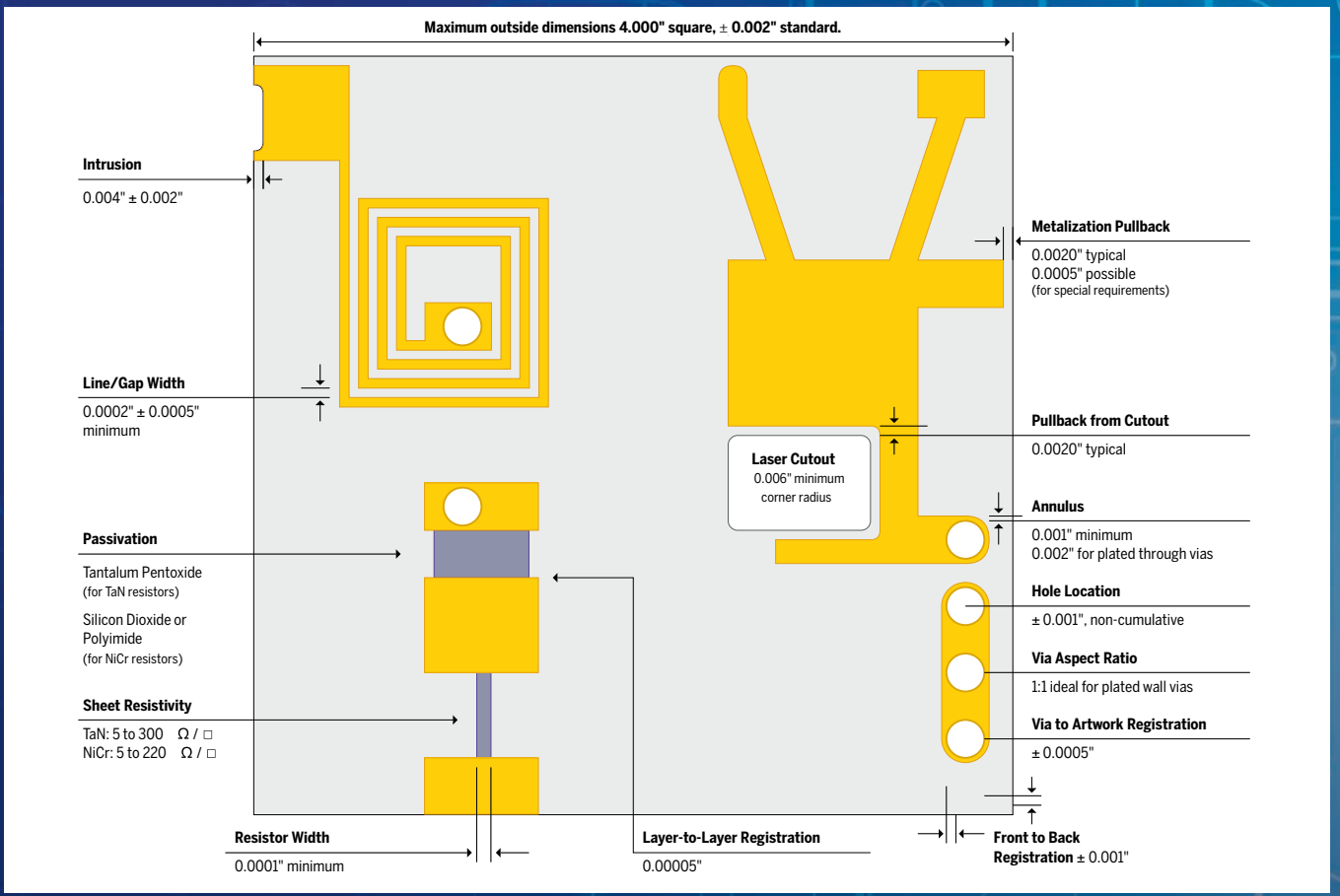
MBT Thin Film Design Guideline Dimensions and Tolerances

MBT's thin film manufacturing methods guarantee to meet the toughest thin film design goals. Our state of the art thin film manufacturing capabilities and experienced thin film team allow us to meet and exceed your most demanding standard or custom thin film requirements.



General Characteristics

Resistance Tolerance	+/- 0.01% to 20%
Resistance Ratio	+/- 0.01% available
TCR Tracking	+/- 2 ppm/°C
Termination Material	Gold (Standard)
Wafer Size	Up to 4 in × 4 in
Line Width Definition (Resistor)	0.1 mils
Line Width Definition (Conductor)	0.2 mils
Metals Available	Gold, Nickel, NiChrome, Palladium, Platinum, Tantalum, Tantalum Nitride, Titanium, Titanium Tungsten (TiW), Silver
Specialty Materials	Metalization available on 1 – 6 sides Through-holes (vias), edge wraps, and custom laser cutouts
Lift-off Process	Lift-off patterning available

Substrate Characteristics

	Substrate Material	Available Thickness (standard)	Dielectric Constant (at 1 MHz)	Thermal Conductivity ($W \cdot m^{-1} \cdot K^{-1}$)
	Quartz	0.005 in – 0.010 in	3.8	1.38
	Silicon	0.005 in – 0.010 in	N/A (SiO_2 K = 3.8)	149 (SiO_2 1.38)
	Beryllium Oxide (BeO)	0.005 in – 0.025 in	6.6	285
	Aluminum Nitride (AlN)	0.005 in – 0.025 in	8.7	170
	Alumina (Al_2O_3)	0.005 in – 0.025 in	9.8	26.9

Conductor Materials

	Material	Standard Thickness
	Sputtered Gold *(Au)*	5 kÅ *(Si/Au Back)*
	Plated Gold *(Au)*	25 kÅ

Resistive Material Characteristics

	Resistive Material	Sheet Resistivity	Passivation	Standard TCR	Optional TCR
	Tantalum Nitride	5 Ω/sq – 300 Ω/sq	Ta_2O_5 (Self-Passivating)	+/- 150 ppm/°C	+/- 50 ppm/°C
	NiChrome	5 Ω/sq – 250 Ω/sq	SiO_2	+/- 25 ppm/°C	+/- 5 ppm/°C

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