



Lead Free Certification and RoHS Compliance

International Resistive Company - IRC
 Wire and Film Technologies - WAFT
 736 Greenway Road
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Rev: 01/08/2010

Description	Low Value Metal Film Resistor	Ultra-High Value Precision Resistor	Axial Lead Precision Wirewound Resistor	Precision Wirewound Printed Circuit Board Resistor (Radial I Leaded)	Wirewound Resistor	Wirewound Resistor	Wirewound Resistor	Chassis Mounted Power Wirewound Resistor	Telecommunications Line Feed Resistor	High Power Metal Glaze Resistor	Semi-Proprietary Power Wirewound Resistor	Beryllia Core Silicon Coated Power Resistor	Commercial Grade Axial Lead Power Film	Commercial Grade Axial Lead Power Wirewound	Carbon Film	Commercial Grade Carbon Film	Commercial Grade Power Axial Wirewound
Product Series	2500	3810	7000	4000	2LPW	4LPW	AL	ALFR	ARG	AS	B	CAF	CAW	CF	CCF	CCW	
Product Status	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	
TIMELINE																	
Scheduled Transition Date Code (Date that manufacturing will shift to lead free.)	July 1, 2005	July 1, 2005	Not Planned	Not Planned	July 1, 2005	July 1, 2005	July 1, 2005	Not Planned	July 1, 2008	July 1, 2005	July 1, 2008	March 1, 2007	March 1, 2007	July 1, 2005	March 1, 2007	March 1, 2007	
Discontinuation Date Code For Tin-Lead Finish (YYYY) (Date after which no tin-lead will be manufactured.)	July 1, 2005	July 1, 2005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	March 1, 2007	March 1, 2007	N/A	March 1, 2007	March 1, 2007	
Lead-Free finish	100% Matte Sn over Ni	100% Matte Sn over Ni	N/A	N/A	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	N/A	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn	100% Matte Sn	100% Matte Sn over Ni	100% Matte Sn	100% Matte Sn
REFLOW CONDITIONS																	
Peak Reflow Temperature (°C)	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°
MSL in accordance with J-STD 020C	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
COMPONENT AND PACKAGE MARKING																	
Component Marking (Pb Free Indicator)	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Packaging Marking (Pb Free Indicator on reel, tube, etc.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RoHS Compliance including DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 and DIRECTIVE 2003/11/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 February 2003	YES	YES	NO	NO	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
RESTRICTED SUBSTANCES																	
Reference: EIA/EICTA/GPSSI JOINT INDUSTRY GUIDE- MATERIAL COMPOSITION DECLARATION GUIDE (DRAFT XX-XXXX, September 19, 2003)																	
LEVEL-A	None	None	None	Lead (Pb)	None	None	None	None	Lead (Pb)	None	None	None	None	None	None	None	None
LEVEL-B	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu) Beryllium (Be)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)
IMDS REPORTABLE SUBSTANCES																	
Reference: IMDS International list of reportable substances																	
Nickel (Ni)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lead (Pb)			X	X				X				X					
Copper (Cu)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Beryllium (Be)												X					
ROHS Substances - Content (PPM)																	
Lead (Pb)	0	0	contained on terminals only	contained on terminals only	0	0	0	0	0	0	0	0	0	0	0	0	0
Mercury (Hg)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexavalent Chromium (Cr ⁶⁺)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polybrominated Biphenyls (PBB)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polybrominated Diphenylethers (PBDE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium (Cd)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* Materials content are IRC-WAFT Engineering good faith estimates.
 ** RoHS-compliant components must be specified with appropriate part numbers.
 *** Components are available with Sn/Pb terminations. Consult factory for details.



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Description	Precision High Voltage Thick Film Resistors	Metal Glaze Cylindrical Surface Mount Resistors (General Purpose)	Metal Glaze Cylindrical Surface Mount Resistors (Stige)	Metal Glaze Cylindrical Surface Mount Resistors (1W Rating in 1/2 Watt Package)	Metal Glaze Cylindrical Surface Mount Resistors (Temperature Sensitive)	Commercial Grade Carbon Film	Military Thick Film High Voltage Resistors	Commercial Grade Metal Oxide	Four Terminal Open Air Low ohm Current Sense Resistor	Four Terminal Open Air Low ohm Current Sense Resistor	Two Terminal Molded Low ohm Current Sense Resistor	Commercial Grade Vertical Lead Power Film	Commercial Grade Vertical Lead Power Wirewound	High Voltage Thick Film Resistor	Precision Non-Military Metal Glaze Resistor	Precision Non-Military Metal Glaze Resistor
Product Series	CGH	CHP	CHP1S	CHP1X	CHPT	CMF	CMH	CMO	CSL	CSLS	CSS	CVF	CVW	F	GF	GP
Product Status	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Inactive	Active	Active	Active	Active	Active
TIMELINE																
Scheduled Transition Date Code (Date that manufacturing will shift to lead free.)	July 1, 2008	July 1, 2005	July 1, 2005	July 1, 2005	July 1, 2008	March 1, 2007	Not Planned	March 1, 2007	July 1, 2005	July 1, 2008	July 1, 2005	March 1, 2007	March 1, 2007	July 1, 2005	October 2005	October 2005
Discontinuation Date Code For Tin-Lead Finish (YYYY) (Date after which no tin-lead will be manufactured.)	N/A	N/A	N/A	N/A	N/A	March 1, 2007	N/A	March 1, 2007	N/A	N/A	N/A	March 1, 2007	March 1, 2007	N/A	N/A	N/A
Lead-Free finish	100% Matte Sn over Ni	96% Sn / 3.5% Ag / 0.5% Cu	96% Sn / 3.5% Ag / 0.5% Cu	96% Sn / 3.5% Ag / 0.5% Cu	96% Sn / 3.5% Ag / 0.5% Cu	100% Matte Sn	N/A	100% Matte Sn	96% Sn / 3.5% Ag / 0.5% Cu	N/A	96% Sn / 4% Ag	100% Matte Sn	100% Matte Sn	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni
REFLOW CONDITIONS																
Peak Reflow Temperature (°C)	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°
MSL in accordance with J-STD 020C	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
COMPONENT AND PACKAGE MARKING																
Component Marking (Pb Free Indicator)	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Packaging Marking (Pb Free Indicator on reel, tube, etc.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RoHS Compliance including DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 and DIRECTIVE 2003/11/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 February 2003	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
RESTRICTED SUBSTANCES																
Reference: EIA/EICTA/GPSSI JOINT INDUSTRY GUIDE- MATERIAL COMPOSITION DECLARATION GUIDE (DRAFT XX-XXXX, September 19, 2003)																
LEVEL-A	Lead (Pb)	None	None	None	Lead (Pb)	None	Lead (Pb)	None	None	None	None	None	None	None	None	None
LEVEL-B	Nickel (Ni) Copper (Cu)	Nickel (Ni)	Nickel (Ni)	Nickel (Ni)	Nickel (Ni)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)
IMDS REPORTABLE SUBSTANCES																
Reference: IMDS International list of reportable substances																
Nickel (Ni)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lead (Pb)	X				X		X									
Copper (Cu)	X					X	X	X	X	X	X	X	X	X	X	X
Beryllium (Be)																
ROHS Substances - Content (PPM)																
Lead (Pb)	0	0	0	0	0	0	contained on terminals only	0	0	0	0	0	0	0	0	0
Mercury (Hg)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexavalent Chromium (Cr ⁶⁺)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polybrominated Biphenyls (PBB)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polybrominated Diphenylethers (PBDE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium (Cd)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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 *** Components are available with Sn/Pb terminations. Consult factory for details.



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Description	Thick Film, Semi-Precision Thick Film Resistor	Precision Wirewound and Radial Lead Resistor (Mil-R-93) Carbon Composition, Axial Leaded	Low Cost Semi-Precision Power Wirewound Resistor	Low Resistance Metal Element Resistor	Low Resistance Metal Element Resistor	Metal Glaze Cylindrical Surface Mount Resistor (High Reliability)	Metal Film Resistor - Cement Coated	Flame Proof Power Metal Film Resistor	Metal Film Resistors	Metal Oxide, Axial Lead	Metal Oxide, Miniature, Axial Lead	Metal Glaze Cylindrical Surface Mount Resistor (General Purpose)	Metal Glaze Cylindrical Surface Mount Resistor (High Power Density)	Semi-Precious Power Wirewound Resistor (Non-Inductive)	Semi-Precision Power Wirewound Resistor (Non-Inductive)	
Product Series	GS-3	HR	IBT	LAS	LOB	LRMA	MCHP	MF-S	MFR	MFR4P	MO	MOM	MM	MRC	NAS	NT (POWER WW)
Product Status	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active
TIMELINE																
Scheduled Transition Date Code (Date that manufacturing will shift to lead free.)	October 2005	Not Planned	Product lead-free >5 yrs	July 1, 2005	February 2005	February 2005	Not Planned	July 1, 2005	July 1, 2005	July 1, 2005	July 1, 2005	July 1, 2005	September 2005	September 2005	July 1, 2005	July 1, 2005
Discontinuation Date Code For Tin-Lead Finish (YYYY) (Date after which no tin-lead will be manufactured.)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead-Free finish	100% Matte Sn over Ni	N/A	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	N/A	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	96% Sn / 3.5% Ag / 0.5% Cu	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni
REFLOW CONDITIONS																
Peak Reflow Temperature (°C)	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°
MSL in accordance with J-STD 020C	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
COMPONENT AND PACKAGE MARKING																
Component Marking (Pb Free Indicator)	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Packaging Marking (Pb Free Indicator on reel, tube, etc.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RoHS Compliance including DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 and DIRECTIVE 2003/11/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 February 2003	YES	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES Limited Availability	YES	YES
RESTRICTED SUBSTANCES																
Reference: EIA/EICTA/GPSSI JOINT INDUSTRY GUIDE-MATERIAL COMPOSITION DECLARATION GUIDE (DRAFT XX-XXXX, September 19, 2003)																
LEVEL-A	None	Lead (Pb)	None	None	None	None	Lead (Pb)	None	None	None	None	None	None	None	None	None
LEVEL-B	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)
IMDS REPORTABLE SUBSTANCES																
Reference: IMDS International list of reportable substances																
Nickel (Ni)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lead (Pb)		X					X									
Copper (Cu)	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
Beryllium (Be)																
ROHS Substances - Content (PPM)																
Lead (Pb)	exempted internal hi-T solder joint; Pb on terminals	contained on terminals only	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mercury (Hg)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexavalent Chromium (Cr ⁶⁺)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polybrominated Biphenyls (PBB)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polybrominated Diphenylethers (PBDE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium (Cd)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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 *** Components are available with Sn/Pb terminations. Consult factory for details.



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Description	Open Air Current Sense Resistor	Open Air Surface Mount Current Sense Resistor	Precision Wirewound and Radial Leaded Resistor (Mil-R-99)	Extremely Low Resistance Power Wirewound	Metal Glaze Cylindrical Surface Mount Resistor (High Power/Ceramic Package)	Semi-Precision Power Wirewound Resistor (Pulse/Surge)	General Purpose Axial Leaded Power Wirewound Resistor	High Power Wire Resistor	General Purpose Stand-Up Power Wirewound Resistor	General Purpose Power Metal Glaze Resistor	Low Resistance Stand-Up Power Wirewound Resistor	Precision Wirewound and Radial Leaded Resistor (Mil-R-93)	Precision Wirewound and Radial Leaded Resistor (Mil-R-390)	Precision Non-Military Metal Glaze Resistor	Metal Glaze Fusing Resistor	Thick Film Temperature Compensation Resistor
Product Series	OAR	OARS	PC	PLO	PPS-1	PPW	PW	PWHW	PWR	PWRG	PWRL	RB	RBR	RG (RGP)	RGF	RGT
Product Status	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active
TIMELINE																
Scheduled Transition Date Code (Date that manufacturing will shift to lead free.)	February 2005	February 2005	Not Planned	July 1, 2005	September 2005	July 1, 2005	July 1, 2005	Lead-free for product lifetime	July 1, 2005	November 2005	July 1, 2005	Not Planned	Not Planned	July 1, 2008	July 1, 2008	July 1, 2008
Discontinuation Date Code For Tin-Lead Finish (YYYY) (Date after which no tin-lead will be manufactured.)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead-Free finish	100% Matte Sn over Ni	98% Sn / 4% Ag	N/A	100% Matte Sn over Ni	96% Sn / 3.5% Ag / 0.5% Cu	100% Matte Sn over Ni	100% Matte Sn over Ni	Application Specific	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	N/A	N/A	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni
REFLOW CONDITIONS																
Peak Reflow Temperature (°C)	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°
MSL in accordance with J-STD 020C	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
COMPONENT AND PACKAGE MARKING																
Component Marking (Pb Free Indicator)	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Packaging Marking (Pb Free Indicator on reel, tube, etc.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RoHS Compliance including DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 and DIRECTIVE 2003/11/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 February 2003																
	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES
RESTRICTED SUBSTANCES																
Reference: EIA/EICTA/GPSSI JOINT INDUSTRY GUIDE-MATERIAL COMPOSITION DECLARATION GUIDE (DRAFT XX-XXXX, September 19, 2003)																
LEVEL-A	None	None	Lead (Pb)	None	None	None	None	None	None	None	None	Lead (Pb)	Lead (Pb)	Lead (Pb)	Lead (Pb)	Lead (Pb)
LEVEL-B	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)
IMDS REPORTABLE SUBSTANCES																
Reference: IMDS International list of reportable substances																
Nickel (Ni)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lead (Pb)			X									X	X	X	X	X
Copper (Cu)	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Beryllium (Be)																
ROHS Substances - Content (PPM)																
Lead (Pb)	0	0	contained on terminals only	0	0	0	0	0	0	0	0	0	0	0	0	0
Mercury (Hg)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexavalent Chromium (Cr ⁶⁺)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polybrominated Biphenyls (PBB)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polybrominated Diphenylethers (PBDE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium (Cd)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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 ** RoHS-compliant components must be specified with appropriate part numbers.
 *** Components are available with Sn/Pb terminations. Consult factory for details.



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Description	Semi-Precision Mil-Qualified Metal Glaze Resistor	Established Reliability Mil-Qualified Metal Glaze Resistor	Precision Mil-Qualified Metal Glaze Resistor	Established Reliability Mil-Qualified Metal Glaze Resistor	Axial Lead Precision Wirewound Resistor	General Purpose Fail-safe Molex Wirewound Resistor	General Purpose Fail-safe Molex Wirewound Resistor	General Purpose Fail-safe Molex Wirewound Resistor	General Purpose Fail-safe Molex Wirewound Resistor	Low Cost General Purpose Conformal Coated Wirewound Resistor	Semi-Precision Polymer Wirewound Resistor	Precision Non-Military Metal Glaze Resistors	Precision Non-Military Metal Glaze Resistors	Precision Non-Military Metal Glaze Resistors	Precision Non-Military Metal Glaze Resistors	Thick Film on Stainless Steel Substrate	Wirewound Surface Mount
Product Series	RL	RLR	RN	RNC	SP	SP20	SPF	SPH	SPP	T (POWER WW)	TO	T2	T9	TF	TFS	ULR B	
Product Status	Active	Active	Active	Inactive	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active	
TIMELINE																	
Scheduled Transition Date Code (Date that manufacturing will shift to lead free.)	Not Yet Available	Not Yet Available	Not Yet Available	Not Yet Available	July 1, 2005	July 1, 2005	July 1, 2005	July 1, 2005	July 1, 2005	July 1, 2005	July 1, 2005	July 1, 2008	July 1, 2008	July 1, 2008	July 1, 2008	July 1, 2005	July 1, 2005
Discontinuation Date Code For Tin-Lead Finish (YYYY) (Date after which no tin-lead will be manufactured.)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	July 1, 2005
Lead-Free finish	N/A	N/A	N/A	N/A	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	100% Matte Sn over Ni	Application Specific	100% Matte Sn over Ni
REFLOW CONDITIONS																	
Peak Reflow Temperature (°C)	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°	260°
MSL in accordance with J-STD 020C	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
COMPONENT AND PACKAGE MARKING																	
Component Marking (Pb Free Indicator)	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Packaging Marking (Pb Free Indicator on reel, tube, etc.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RoHS Compliance including DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 and DIRECTIVE 2003/11/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 February 2003	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
RESTRICTED SUBSTANCES																	
Reference: EIA/EICTA/GPSSI JOINT INDUSTRY GUIDE-MATERIAL COMPOSITION DECLARATION GUIDE (DRAFT XX-XXXX, September 19, 2003)																	
LEVEL-A	Lead (Pb)	Lead (Pb)	Lead (Pb)	Lead (Pb)	None	None	None	None	None	None	None	Lead (Pb)	Lead (Pb)	Lead (Pb)	Lead (Pb)	None	None
LEVEL-B	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)
IMDS REPORTABLE SUBSTANCES																	
Reference: IMDS International list of reportable substances																	
Nickel (Ni)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lead (Pb)	X	X	X	X								X	X	X	X		
Copper (Cu)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Beryllium (Be)																	
ROHS Substances - Content (PPM)																	
Lead (Pb)	exempted internal hi-T solder joint; Pb on terminals	exempted internal hi-T solder joint; Pb on terminals	exempted internal hi-T solder joint; Pb on terminals	exempted internal hi-T solder joint; Pb on terminals	0	0	0	0	0	0	0	exempted internal hi-T solder joint	exempted internal hi-T solder joint	exempted internal hi-T solder joint	exempted internal hi-T solder joint	exempted internal hi-T solder joint	0
Mercury (Hg)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexavalent Chromium (Cr ⁶⁺)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polybrominated Biphenyls (PBB)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polybrominated Diphenylethers (PBDE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium (Cd)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* Materials content are IRC-WAFT Engineering good faith estimates.
 ** RoHS-compliant components must be specified with appropriate part numbers.
 *** Components are available with Sn/Pb terminations. Consult factory for details.



Lead Free Certification and RoHS Compliance

International Resistive Company - IRC
 Wire and Film Technologies - WAFT
 736 Greenway Road
 P.O. Box 1860
 Boone, NC 28607 USA
 telephone: 828.264.8861
 fax: 828.264.8865

Rev: 01/08/2010

Description	Wirewound, Surface Mount	Precision Wirewound Printed Circuit Board Resistor (MLP-R-99)	Wirewound, Surface Mount	Metal Glaze Cylindrical Surface Mount Resistors (Zerohm Jumpers)	Jumpier Wire Resistor
Product Series	ULR G	VA	WSM	ZCHP	ZEROHM
Product Status	Active	Active	Active	Active	Active
TIMELINE					
Scheduled Transition Date Code (Date that manufacturing will shift to lead free.)	July 1, 2005	Not Planned	July 1, 2005	October 2005	July 2006
Discontinuation Date Code For Tin-Lead Finish (YYYY) (Date after which no tin-lead will be manufactured.)	July 1, 2005	N/A	July 1, 2005	N/A	N/A
Lead-Free finish	96% Sn / 3.5% Ag / 0.5% Cu	100% Matte Sn over Ni	100% Matte Sn over Ni	96% Sn / 3.5% Ag / 0.5% Cu	100% Matte Sn over Ni
REFLOW CONDITIONS					
Peak Reflow Temperature (°C)	260°	260°	260°	260°	260°
MSL in accordance with J-STD 020C	2	2	2	2	2
COMPONENT AND PACKAGE MARKING					
Component Marking (Pb Free Indicator)	No	No	No	No	No
Packaging Marking (Pb Free Indicator on reel, tube, etc.)	Yes	Yes	Yes	Yes	Yes
RoHS Compliance including DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 and DIRECTIVE 2003/11/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 February 2003	YES	NO	YES	YES	YES
RESTRICTED SUBSTANCES					
Reference: EIA/EICTA/GPSSI JOINT INDUSTRY GUIDE- MATERIAL COMPOSITION DECLARATION GUIDE (DRAFT XX-XXXX, September 19, 2003)					
LEVEL-A	None	Lead (Pb)	None	None	None
LEVEL-B	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni) Copper (Cu)	Nickel (Ni)	Nickel (Ni) Copper (Cu)
IMDS REPORTABLE SUBSTANCES					
Reference: IMDS International list of reportable substances					
Nickel (Ni)	X	X	X	X	X
Lead (Pb)		X			
Copper (Cu)	X	X	X		X
Beryllium (Be)					
ROHS Substances - Content (PPM)					
Lead (Pb)	0	contained on terminals only	0	0	exempted internal hi-T solder joint; Pb on terminals
Mercury (Hg)	0	0	0	0	0
Hexavalent Chromium (Cr ⁶⁺)	0	0	0	0	0
Polybrominated Biphenyls (PBB)	0	0	0	0	0
Polybrominated Diphenylethers (PBDE)	0	0	0	0	0
Cadmium (Cd)	0	0	0	0	0

* Materials content are IRC-WAFT Engineering good faith estimates.
 ** RoHS-compliant components must be specified with appropriate part numbers.
 *** Components are available with Sn/Pb terminations. Consult factory for details.