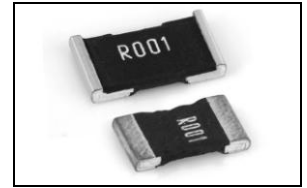


LR Series

Metal Alloy Low-Resistance Resistor

- This specification is applicable to lead free, halogen free of RoHS directive for metal alloy low-resistance resistor.
- The product is for general purpose.
- The available AEC-Q200 report also can provide by customer request.
- Miniature size suitable for compact Print Circuit Boards of high-precision electronic products.
- Applications include : Power Supply, Battery Pack, Measurable Instrument, LED Driver and Others.



■ GENERAL SPECIFICATIONS

Model	Max. Rating Power at 70°C	Max. Rating Current	Max. Overload Current	TCR [PPM/°C]	Resistance Range[mΩ]		Operating Temp. Range
					±0.5% (D)	±1.0% (F) ±2.0% (G) ±5.0% (J)	
LR1206	0.5W	40.82A	81.64A	0.3mΩ: ≤ ±450 0.5~0.9mΩ: ≤ ±175 1.0~15.0mΩ: ≤ ±75 15.1~50.0mΩ: ≤ ±50	7~50	0.3~50	-55~170°C
	1W	57.74A	115.47A		7~50		
	1.5W	70.71A	141.42A		-	0.3~1	
LR2010	1W	44.72A	89.44A	0.5~0.9 mΩ: ≤ ±100 1.0~1.9mΩ: ≤ ±75 2.0~6.9mΩ: ≤ ±50 7.0~100mΩ: ≤ ±25	7~49	0.5~100	
	1.5W	54.77A	109.54A		7~40	0.5~40	
	2W	63.25A	126.49A		7~12	0.5~12	
LR2512	1W	57.74A	129.1A	0.3mΩ: ≤ ±150 0.5~1.0mΩ: ≤ ±75 1.1~3.0mΩ: ≤ ±50 3.1~100mΩ: ≤ ±25	7~50	0.3~100	
	1.5W	70.71A	158.11A			0.3~75	
	2W	81.65A	182.57A	0.3mΩ: ≤ ±150 0.5~1.0mΩ: ≤ ±75 1.1~3.0mΩ: ≤ ±50 3.1~75mΩ: ≤ ±25	7~10	0.3~10	
	3W	100A	223.61A	0.3mΩ: ≤ ±150 0.5~1.0mΩ: ≤ ±75 1.1~2.5mΩ: ≤ ±50 2.6~10.0mΩ: ≤ ±25	-	76~200	
LR2512H	2W	5.13A	11.47A	76~200mΩ: ≤ ±50	-	76~200	
	3W	17.3A	38.54A	10.1~60mΩ: ≤ ±50	10.1~50	10.1~60	
LR2725	4W	126.49A	252.95A	0.20mΩ: ≤ ±100 0.25~3.0mΩ: ≤ ±50	-	0.2~3	
	5W	158.11A	273.86A	0.20mΩ: ≤ ±100 0.25~0.5mΩ: ≤ ±50	-	0.20~0.5	
LR2728	3W	27.39A	47.43A	4.0~100mΩ: ≤ ±25	4~19	4~100	
	3.5W	29.58A	51.23A			4~50	
	4W	31.62A	63.25A			4.0~50.0mΩ: ≤ ±25	
LR4527S (without Heat sink)	2W	63.25A	109.54A	0.5~1mΩ ≤ ±75 1.1~100mΩ ≤ ±50	7~100	0.5~100	
	3W	77.5A	134A	0.5~1mΩ ≤ ±75 1.1~27mΩ ≤ ±50	7~27	0.5~27	
	5W	100A	173A	0.5~1mΩ ≤ ±75 1.1~7.5mΩ ≤ ±50	7~7.5	0.5~7.5	
LR4527	5W	100A	173A	0.5~1mΩ ≤ ±75 1.1~200mΩ ≤ ±50	7~120	0.5~200	

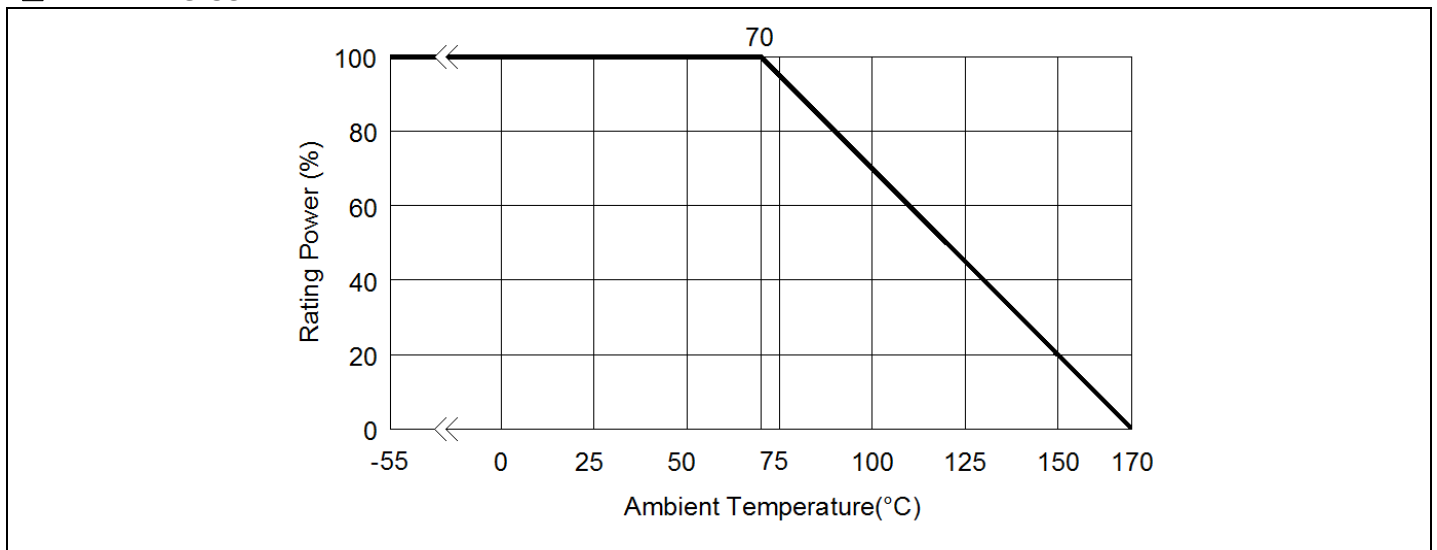


CHARACTERISTICS

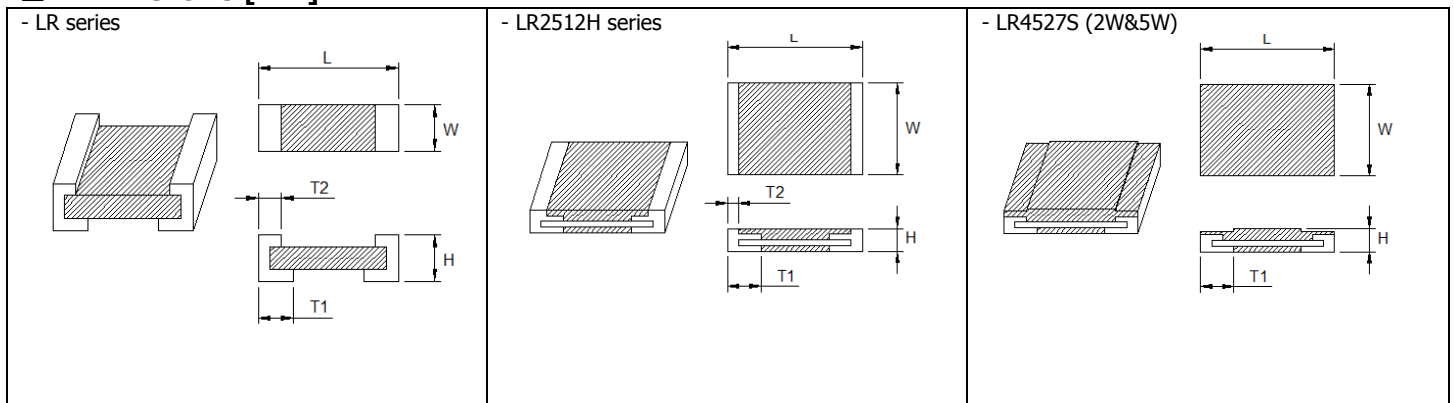
Temperature Coefficient of Resistance	Refer to Paragraph general specifications	JIS C 5201 4.8 Method; $TCR(ppm/^{\circ}C) = \{(R2-R1)/R1(T2-T1)\} \times 10^6$ R1 : Resistance of room temp.(T1), R2 : Resistance of 150°C(T2)
Short Time Overload	LR4527(S) : $(\Delta R/R1) \leq \pm 2.0\%$ Others : $(\Delta R/R1) \leq \pm 0.5\%$	LR2725(5W)/LR2728/LR4527(S) : 3times rated power, 5seconds LR2512(H) : 5times rated power, 5 seconds
Insulation Resistance	$\geq 10^9 \Omega$	JIS C 5201 4.6 Method; DC100V _{DC} for 1minute
Dielectric Withstanding Voltage	Without break down	JIS C 5201 4.7 Method; Applied AC500V _{AC} for 1minute, Limit surge current maximum 50mA
Resistance to Solder Heat	$(\Delta R/R1) \leq \pm 0.5\%$	JIS C 5201 4.18 Method; Solder temperature/immersion time : 260±5°C, 10±1seconds
Solderability test	95% coverage	JIS C 5201 4.17 Method; 245±5°C, 3±0.5 seconds
Resistance to solvent	$(\Delta R/R1) \leq \pm 0.5\%$	JIS C 5201 4.29, 4.30 Method : Immersion time : 60 seconds, @20°C~25°C
Low Temperature Exposure(Storage)	$(\Delta R/R1) \leq \pm 0.5\%$	JIS C 5201 4.23.4 Method : 1,000hours, @-55°C
High Temperature Exposure(Storage)	$(\Delta R/R1) \leq \pm 1.0\%$	JIS C 5201 4.23.2 Method : 1,000hours, +170°C
Temperature Cycling (Rapid Temp. Change)	$(\Delta R/R1) \leq \pm 0.5\%$	JIS C 5201 4.19 Method : Air to air, -55°C to +150°C, 1,000cycles, 15minutes at each extreme, transition time 2 to 3 minutes
Moisture Resistance (Climatic Sequence)	$(\Delta R/R1) \leq \pm 0.5\%$	Mil-STD-202, Method 106
Bias Humidity	$(\Delta R/R1) : \leq \pm 0.5\%$	JIS C 5201 4.24 Method : +85°C, 85% RH, 10% Bias, 1.5 hours On, 0.5 hours Off. Extended Life Test : 1,000 hours.
Load Life	LR4527 : $(\Delta R/R1) \leq \pm 2.0\%$ Others : $(\Delta R/R1) \leq \pm 1.0\%$	JIS C 5201 4.25.1 Method : Test temperature 70°C Rated working voltage 1.5hours On, 0.5hours Off. Extended Life Test : 1,000 hours

* Remark: ΔR = (resistance after stress – resistance before stress); R1 means resistance before stress

DERATING CURVE



■ DIMENSIONS [mm]



Model	Max. Power Rating[W]	Resistance Range[mΩ]	DIMENSIONS - in inches (millimetres)									
			L	W	H	T1	T2					
LR1206	0.5 & 1	0.3	0.126±0.010 (3.200±0.254)	0.063±0.010 (1.600±0.254)	0.039±0.010 (1.000±0.254)	0.022±0.010 (0.550±0.254)	-					
		0.5~0.6				0.029±0.010 (0.725±0.254)						
		1				0.020±0.010 (0.508±0.254)						
		2~4				0.024±0.010 (0.600±0.254)						
		5				0.020±0.010 (0.508±0.254)						
	1.5	0.3			0.039±0.010 (1.000±0.254)	0.022±0.010 (0.550±0.254)						
		0.5~0.6			0.029±0.010 (0.725±0.254)	0.020±0.010 (0.508±0.254)						
		1			0.025±0.010 (0.645±0.254)	0.020±0.010 (0.508±0.254)						
		LR2010			1 & 1.5 & 2	0.5~0.9		0.200±0.010 (5.080±0.254)	0.100±0.010 (2.540±0.254)	0.031±0.010 (0.787±0.254)	0.057±0.010 (1.440±0.254)	-
						1~3					0.051±0.010 (1.295±0.254)	
3.1~4	0.025±0.010 (0.645±0.254)		0.031±0.010 (0.787±0.254)									
4.1~100												
LR2512	1 & 1.5	0.3	0.246±0.010 (6.248±0.254)	0.126±0.010 (3.202±0.254)	0.040±0.010 (1.000±0.254)	0.079±0.010 (2.02±0.254)	-					
		0.5~3			0.031±0.010 (0.787±0.254)	0.074±0.010 (1.880±0.254)						
		3.1~4			0.025±0.010 (0.645±0.254)	0.044±0.010 (1.118±0.254)						
		4.1~75				0.034±0.010 (0.868±0.254)						
		75.1~100										
	2	0.3			0.040±0.010 (1.000±0.254)	0.079±0.010 (2.02±0.254)						
		0.5~3			0.031±0.010 (0.787±0.254)	0.074±0.010 (1.880±0.254)						
		3.1~4			0.0254±0.010 (0.645±0.254)	0.044±0.010 (1.118±0.254)						
		4.1~75			0.040±0.010 (1.000±0.254)	0.079±0.010 (2.02±0.254)						
	3	0.3				0.074±0.010 (1.880±0.254)						
		0.5										
		0.6~2.9				0.031±0.010 (0.787±0.254)		0.044±0.010 (1.118±0.254)				
		3~4			0.066±0.010 (1.676±0.254)							
	4.1~10	0.025±0.010 (0.645±0.254)			0.044±0.010 (1.118±0.254)							



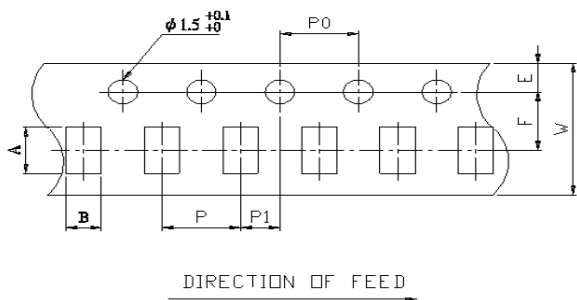
Model	Max. Power Rating[W]	Resistance Range[mΩ]	DIMENSIONS - in inches (millimetres)					
			L	W	H	T1	T2	
LR2512H	2	76~200	0.246±0.010 (6.248±0.254)	0.126±0.010 (3.202±0.254)	0.039±0.010 (1.00±0.254)	0.034±0.010 (0.868±0.254)	0.0039~0.0394 (0.1~1)	
	3	10.1~60				0.044±0.010 (1.118±0.254)		
LR2725	4 & 5	0.2~0.5	0.268±0.010 (6.807±0.254)	0.254±0.010 (6.452±0.254)	0.039±0.010 (0.991±0.254)	0.085±0.010 (2.159±0.254)	-	
		0.6				0.071±0.010 (1.803±0.254)		
		1				0.043±0.010 (1.092±0.254)		
		1.5				0.039±0.010 (0.991±0.254)		
		2				0.035±0.010 (0.889±0.254)		0.085±0.010 (2.159±0.254)
		2.25~2.5						0.071±0.010 (1.803±0.254)
		3						0.065±0.010 (1.651±0.254)
LR2728	3 & 3.5 & 4	4~100	0.264±0.010 (6.706±0.254)	0.283±0.010 (7.188±0.254)	0.039±0.010 (0.991±0.254)	0.045±0.010 (1.143±0.254)	-	
LR4527S (without heat sink)	2	0.5	0.450±0.010 (11.430±0.254)	0.270±0.010 (6.850±0.254)	0.055±0.010 (1.400±0.254)	0.127±0.010 (3.215±0.254)	0.038±0.010 (0.965±0.254)	
		0.6~3				0.071±0.010 (1.815±0.254)		
		4~5				0.127±0.010 (3.215±0.254)		
		5.1~100				0.071±0.010 (1.815±0.254)		
	3	0.5				0.127±0.010 (3.215±0.254)		
		0.6~3				0.071±0.010 (1.815±0.254)		
		4~5				0.127±0.010 (3.215±0.254)		
		5.1~27				0.071±0.010 (1.815±0.254)		
	5	0.5				0.127±0.010 (3.215±0.254)		
		0.6~3				0.071±0.010 (1.815±0.254)		
		4~5				0.127±0.010 (3.215±0.254)		
		5.1~7.5				0.071±0.010 (1.815±0.254)		
LR4527	5	0.5	0.059±0.010 (1.500±0.254)	0.127±0.010 (3.215±0.254)	0.071±0.010 (1.815±0.254)	0.038±0.010 (0.965±0.254)		
		0.6~3				0.071±0.010 (1.815±0.254)		
		4~5				0.127±0.010 (3.215±0.254)		
		5.1~200				0.071±0.010 (1.815±0.254)		

■ SOLDER PAD DIMENSIONS

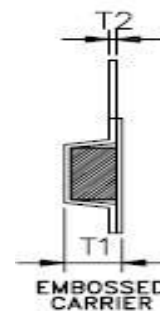
	Type	Max. Power Rating [W]	Resistance Range [mΩ]	SOLDER PAD Dimension in millimetres		
				a	b	i
	LR1206	0.5 & 1 & 1.5	0.3~0.6	1.65	2.18	0.90
			1~50			1.00
	LR2010	1 & 1.5 & 2	0.5~3	2.89	2.92	1.22
			3.1~100			2.41
	LR2512	1 & 1.5	0.3~4	3.05	3.68	1.27
			4.1~100			2.11
		2	0.3~4	3.05		1.27
			4.1~75	2.11		3.18
		3	0.3~0.5	3.05		1.27
			0.6~2.9 & 4.1~10	2.19		3.00
			3~4	2.79		1.80
			LR2512H	2		16~200
	LR2725	4 & 5	0.2~3	3.18	6.86	1.32
	LR2728	3 & 3.5 & 4	4~100	2.75	7.82	3.51
	LR4527S	2	0.5~5	4.8	8.74	5.51
			5.1~100	3.4		8.31
		3	0.5~5	4.8		5.51
			5.1~27	3.4		8.31
5		0.5~5	4.8	5.51		
5.1~7.5	3.4	8.31				
LR4527	5	0.5~5	4.8	8.74	5.51	
		5.1~200	3.4		8.31	

PACKAGING

• Tape Dimensions :

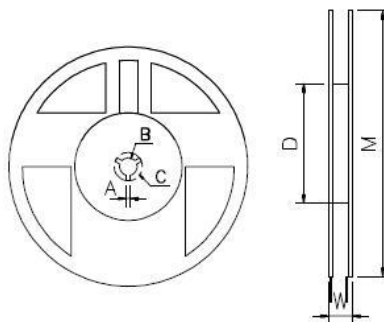


• LR series



Packaging	Model	Dimensions [mm]									
		A	B	W	E	F	T1	T2	P	P0	P1
	LR1206 (0.3-0.6mΩ)	3.50±0.10	1.90±0.10	8.0±0.15	1.75±0.10	3.5±0.10	1.27±0.10	0.23±0.10	4.0±0.10	4.0±0.10	2.0±0.10
	LR1206 (≥1.0mΩ)	3.48±0.10	1.83±0.10	8.0±0.15	1.75±0.10	3.5±0.10	1.10±0.10	0.20±0.10	4.0±0.10	4.0±0.10	2.0±0.10
	LR2010	5.45±0.10	2.90±0.10	12.0±0.15	1.75±0.10	5.5±0.10	1.33±0.10	0.23±0.05	4.0±0.10	4.0±0.10	2.0±0.10
	LR2512 (0.3mΩ)	6.74±0.10	3.50±0.10	12.0±0.15	1.75±0.10	5.5±0.10	1.60±0.10	0.24±0.05	8.0±0.10	4.0±0.10	2.0±0.10
	LR2512	6.75±0.10	3.50±0.10	12.0±0.15	1.75±0.10	5.5±0.10	1.30±0.10	0.20±0.05	4.0±0.10	4.0±0.10	2.0±0.10
	LR2512H	6.75±0.10	3.55±0.10	12.0±0.30	1.75±0.10	5.5±0.10	1.60±0.10	0.20±0.10	4.0±0.10	4.0±0.10	2.0±0.10
	LR2725	7.15±0.10	6.75±0.10	12.0±0.15	1.75±0.10	5.5±0.10	1.95±0.10	0.25±0.05	8.0±0.10	4.0±0.10	2.0±0.10
	LR2728	7.15±0.10	7.70±0.10	12.0±0.15	1.75±0.10	5.5±0.10	1.45±0.10	0.25±0.05	12.0±0.10	4.0±0.10	2.0±0.10
	LR4527	11.8±0.10	7.20±0.10	24.0±0.15	1.75±0.10	11.5±0.10	2.00±0.10	0.30±0.10	12.0±0.10	4.0±0.10	2.0±0.10
	LR4527S	11.8±0.10	7.20±0.10	24.0±0.15	1.75±0.10	11.5±0.10	2.00±0.10	0.30±0.10	12.0±0.10	4.0±0.10	2.0±0.10

• Reel Dimensions :



Reel Dimensions	Model	Reel Type / Tape	W	M	A	B	C	D
	LR1206 (0.3-0.6mΩ)	7" reel for 8mm tape	9.0±0.5	178±2.0	2.0±0.5	13.5±0.5	21.0±0.5	60.0±1.0
	LR1206 (≥1.0mΩ)	7" reel for 8mm tape	9.0±0.5	178±2.0	2.0±0.5	13.5±0.5	21.0±0.5	60.0±1.0
	LR2010	7" reel for 12mm tape	13.8±0.5	178±2.0	2.0±0.5	13.5±0.5	21.0±0.5	80.0±1.0
	LR2512 (0.3mΩ)	7" reel for 12mm tape	13.8±0.5	178±2.0	2.0±0.5	13.5±0.5	21.0±0.5	80.0±1.0
	LR2512(H)	7" reel for 12mm tape	13.8±0.5	178±2.0	2.0±0.5	13.5±0.5	21.0±0.5	80.0±1.0
	LR2725	7" reel for 12mm tape	13.8±0.5	178±2.0	2.0±0.5	13.5±0.5	21.0±0.5	80.0±1.0
	LR2728	7" reel for 24mm tape	25.0±1.0	178±2.0	2.0±0.5	13.2±0.5	17.7±0.5	60.0±1.0
	LR4527(S)	7" reel for 24mm tape	25.0±1.0	178±2.0	2.0±0.5	13.2±0.5	17.7±0.5	60.0±1.0



***Packaging Quantity**

Type	Tape width	Max. Packaging Quantity (pcs/reel)		
		4mm pitch	8mm pitch	12mm pitch
LR1206 (0.3~0.6mΩ)	8mm	2,000 pcs	-	-
LR1206 (≥1.0mΩ)		4,000 pcs		
LR2010	12mm	2,000 pcs / 4,000 pcs	-	-
LR2512 (0.3mΩ)		-	1,000 pcs	-
LR2512		4,000 pcs	-	-
LR2512H		2,000 pcs	-	-
LR2725		-	1,000 pcs	-
LR2728		-	-	1,000 pcs
LR4527(S)		24mm	-	-

MARKING FORMAT : (All the products marking are 4 digits)

a. "R" designated the decimal location in ohms.

Ex) For 1mΩ the product marking is R001;

For 25mΩ the product marking is R025;

For 100mΩ the product marking is R100.

b. "m" designated the decimal location in milliohms.

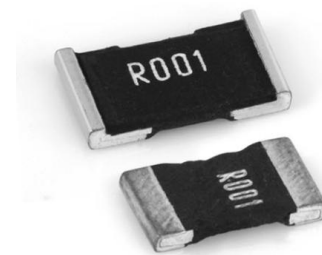
Ex) For 0.25mΩ the product marking is 0m25;

For 0.5mΩ the product marking is 0m50;

For 5.5mΩ the product marking is 5m50;

For 25.5mΩ the product marking is 25m5.

c. Marking image (Please refer to right)



ODERING PROCEDURE EXAMPLE

LR	2512	2	3	R001	F	4
↓	↓	↓	↓	↓	↓	↓
Model #	Size (inch)	Number or terminals	Rated power	Resistance (EX) :	Tolerance	Packaging
	1206		C = 0.5W	R001 = 1mΩ	D : ±0.5%	A = 500pcs
	2010		1 = 1.0W		F : ±1.0%	1 = 1,000pcs
	2512		A = 1.5W		G : ±2.0%	2 = 2,000pcs
	2725		2 = 2.0W		J : ±5.0%	4 = 4,000pcs
	2728		3 = 3.0W			
	4527		B = 3.5W			
	4527S		4 = 4.0W			
			5 = 5.0W			

* Tolerance of LR2512H model = F / G / J