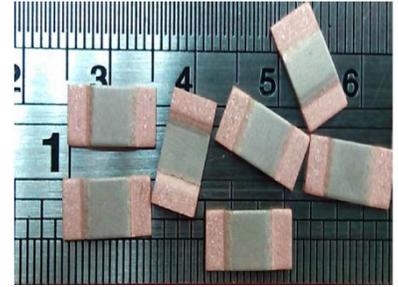
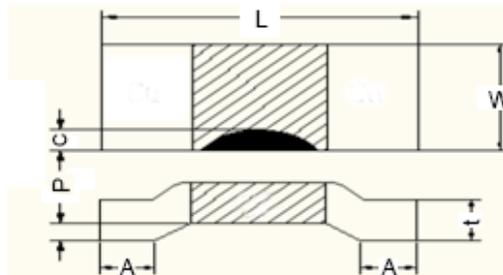


- Features:
- Available in 3W and 5W power ratings
  - Resistance value of 0.3, 0.5 and 1mΩ
  - Current handling up to 129A in 3920 size
  - Excellent long term stability
  - RoHS compliant

- Applications:
- Power modules
  - Frequency converters
  - Current sensor for power hybrid sources
  - High current handling for automotive engine controls and power management

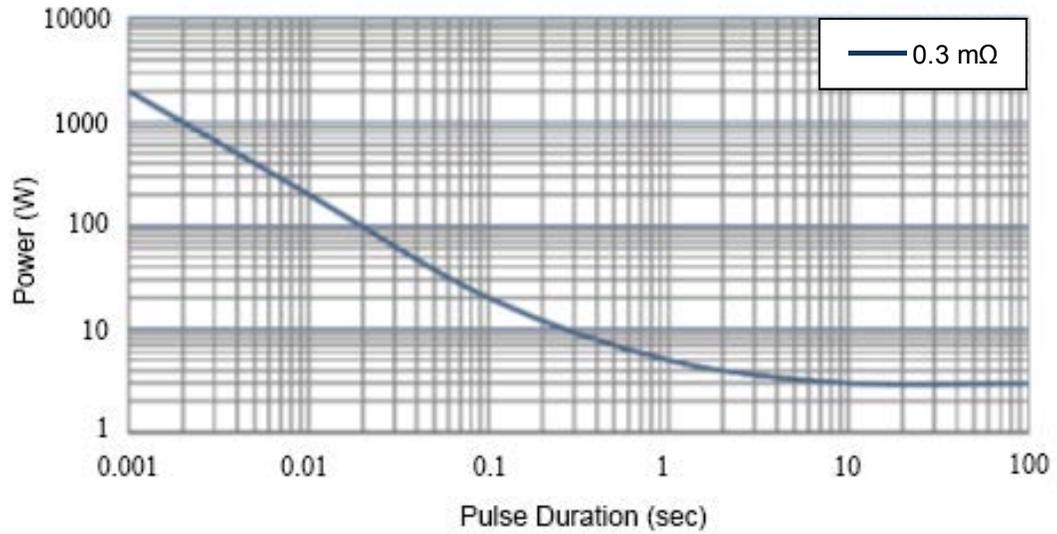


Electrical Specifications			
Type / Code	Power Rating	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance
			1% and 5%
2512	3W	±150 ppm/°C	0.0003
		±115 ppm/°C	0.0005
		±100 ppm/°C	0.001
3920	5W	±150 ppm/°C	0.0003
		±70 ppm/°C	0.0005
		±50 ppm/°C	0.001

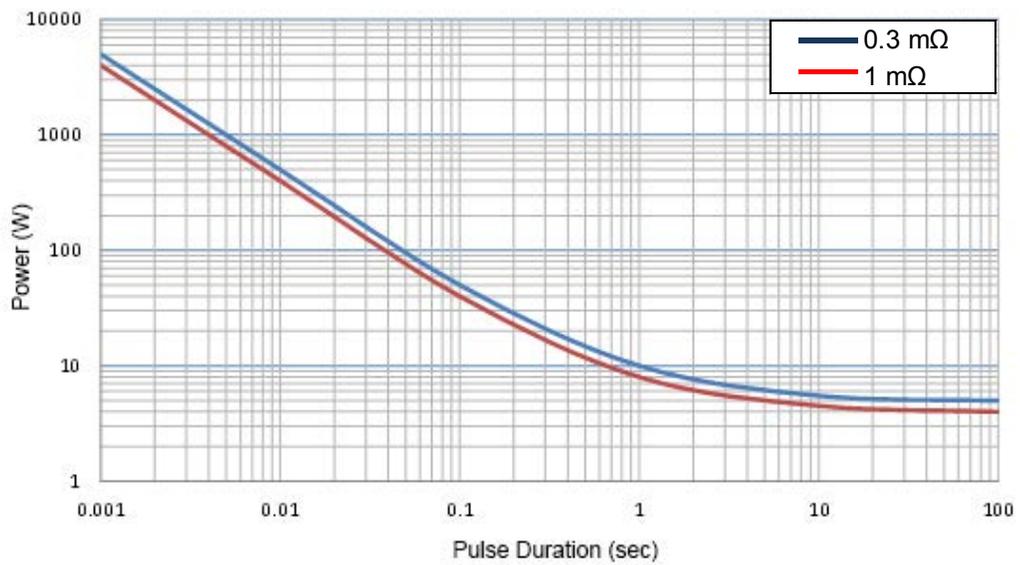


Mechanical Specifications							
Type / Code	L	W	t	A	C (max.)	P	Unit
HCS2512...L300	0.256 ± 0.008	0.128 ± 0.008	0.032 ± 0.006	0.035 ± 0.008	0.016	0.014 ± 0.004	inches
	6.50 ± 0.20	3.25 ± 0.20	0.82 ± 0.15	0.90 ± 0.20	0.40	0.35 ± 0.10	mm
HCS2512...L500	0.256 ± 0.008	0.128 ± 0.008	0.028 ± 0.006	0.035 ± 0.008	0.016	0.014 ± 0.004	inches
	6.50 ± 0.20	3.25 ± 0.20	0.72 ± 0.15	0.90 ± 0.20	0.40	0.35 ± 0.10	mm
HCS2512...1L00	0.256 ± 0.008	0.128 ± 0.008	0.015 ± 0.006	0.035 ± 0.008	0.016	0.014 ± 0.004	inches
	6.50 ± 0.20	3.25 ± 0.20	0.38 ± 0.15	0.90 ± 0.20	0.40	0.35 ± 0.10	mm
HCS3920...L300	0.402 ± 0.008	0.205 ± 0.008	0.056 ± 0.006	0.071 ± 0.012	0.024	0.020 ± 0.004	inches
	10.20 ± 0.20	5.20 ± 0.20	1.42 ± 0.15	1.80 ± 0.30	0.60	0.50 ± 0.10	mm
HCS3920...L500	0.402 ± 0.008	0.205 ± 0.008	0.034 ± 0.006	0.071 ± 0.012	0.024	0.020 ± 0.004	inches
	10.20 ± 0.20	5.20 ± 0.20	0.86 ± 0.15	1.80 ± 0.30	0.60	0.50 ± 0.10	mm
HCS3920...1L00	0.402 ± 0.008	0.205 ± 0.008	0.017 ± 0.006	0.071 ± 0.012	0.024	0.020 ± 0.004	inches
	10.20 ± 0.20	5.20 ± 0.20	0.42 ± 0.15	1.80 ± 0.30	0.60	0.50 ± 0.10	mm

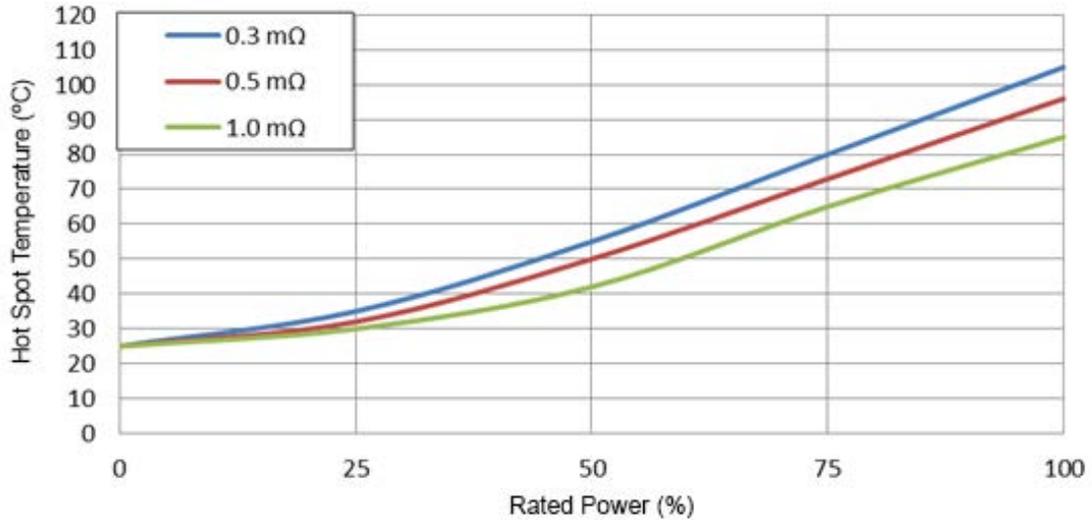
**Pulse Power Characteristics – HCS2512**



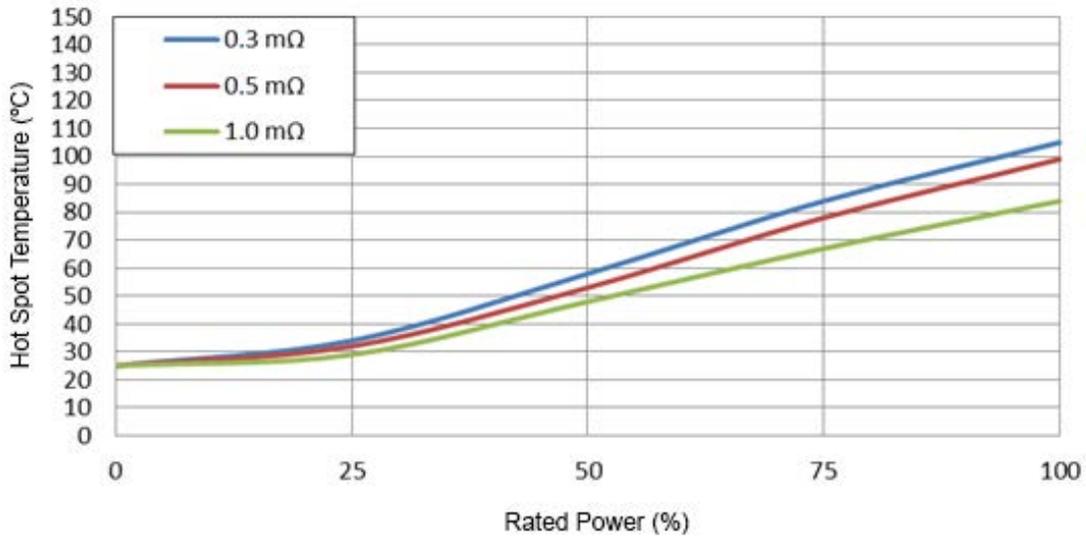
**Pulse Power Characteristics – HCS3920**



**Rated Power vs. Surface Temperature – HCS2512**

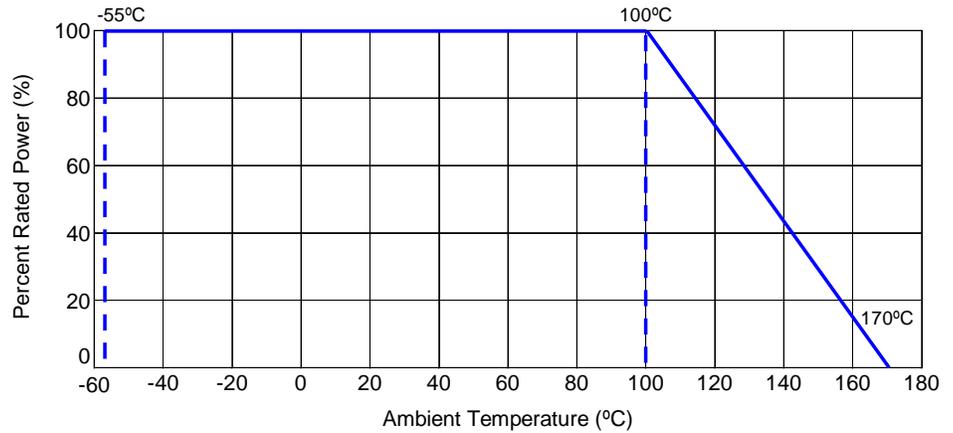


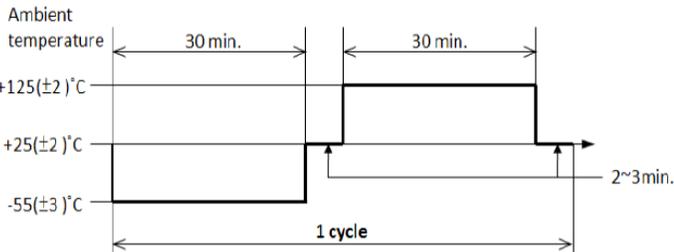
**Rated Power vs. Surface Temperature – HCS3920**



Temperature rise test boards use aluminum substrate (MCPCB).

Power Derating Curve:

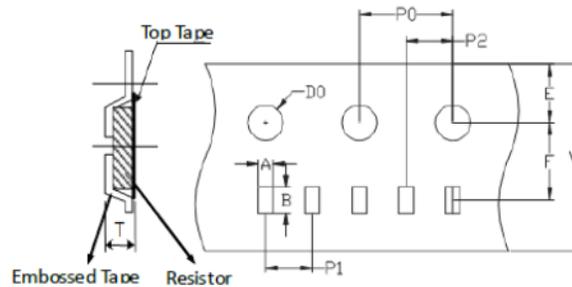


Environmental Performance Characteristics		
Item	Test Condition	Specification
Short Time Overload	5 times rated power for 5 seconds	$\Delta R: \pm(1\%+0.0005\Omega)$
Temperature Coefficient of Resistance (TCR)	+25 °C / +125 °C (JIS-C5202-5.2) $TCR (ppm/^{\circ}C) = -\frac{\Delta R}{R \times \Delta t} \times 10^6$	Refer to Electrical Specifications
Moisture Resistance	The specimens shall be placed in a chamber and subjected to a relative humidity of 90~98% and a temperature of 25°C/65°C, 10 cycles. (MIL-STD-202, Method 106)	$\Delta R: \pm(1\%+0.0005\Omega)$
High Temperature Exposure	The chip (mounted on board) is exposed in the heat chamber, 125°C for 1000 hr. (JIS-C5202-7.2)	$\Delta R: \pm(1\%+0.0005\Omega)$
Load Life	Apply rated power for 1000 hours with 1.5 hours ON and 0.5 hour OFF. (JIS-C5202-7.10)	$\Delta R: \pm(1\%+0.0005\Omega)$
Rapid Change of Temperature	The chip (mounted on board) is exposed, -55 ± 3°C (30 min) / +125 ± 2°C (30 min) for 5 cycles. The following conditions as the figure below. (JIS_C5202-7.4) 	$\Delta R: \pm(1\%+0.0005\Omega)$

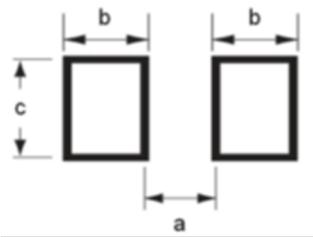
Operating temperature range of -55 to 170°C.  
Storage condition: 22~28°C, humidity of 40~75%.

Function Performance Characteristics		
Item	Test Condition	Specification
Bending Strength	<p>Mount the chip to test 90mm(L)*40mm(W) FR4 printed circuit board substrate. Apply pressure in direction of arrow unit band width reaches 2mm (+0.2/-0mm) illustrated in the picture below and hold for 10 ± 1 sec. (JIS-C5202-6.1)</p> <p>Unit: mm</p>	$\Delta R: \pm(1\%+0.0005\Omega)$
Solderability	<p>The part shall be immersed into the flux specified in the solder bath 235°C ± 5°C for 2 seconds ± 0.5 seconds. It shall be immersed to a point 10mm from its root. (Sn96.5/Ag3.0/Cu0.5) (JIS-C5 202 6.11)</p>	Solder shall cover 95% or more of the electrode area

Note: The terminal temperature of component should be below 100 °C.



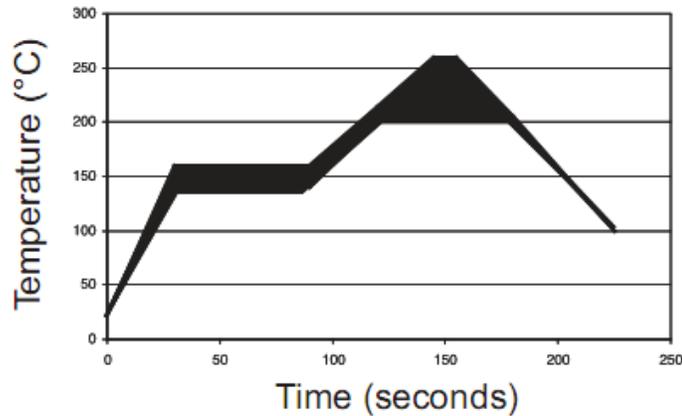
Packaging Specifications											
Type / Code	A	B	E	F	W	P0	P1	P2	D0	T	Unit
2512	0.140 ± 0.004 3.55 ± 0.10	0.266 ± 0.004 6.75 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.217 ± 0.002 5.50 ± 0.05	0.472 ± 0.008 12.00 ± 0.20	0.157 ± 0.002 4.00 ± 0.05	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.059 ± 0.004 1.50 ± 0.10	0.047 ± 0.008 1.20 ± 0.20	inches mm
3920	0.217 ± 0.004 5.50 ± 0.10	0.425 ± 0.004 10.80 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.295 ± 0.002 7.50 ± 0.05	0.630 ± 0.008 16.00 ± 0.20	0.157 ± 0.002 4.00 ± 0.05	0.472 ± 0.004 12.00 ± 0.10	0.236 ± 0.002 6.00 ± 0.05	0.059 ± 0.004 1.50 ± 0.10	0.047 ± 0.008 1.20 ± 0.20	inches mm



Recommended Pad Layout				
Type / Code	a	b	c	Unit
2512	0.150	0.071	0.134	inches
	3.80	1.80	3.40	mm
3920	0.220	0.106	0.244	inches
	5.60	2.70	6.20	mm

**Soldering Recommendations:**

- Peak reflow temperatures and durations
  - ✓ IR Reflow Peak = 260°C max for 10 seconds
  - ✓ Not suitable for wave soldering
- Compatible with lead and lead-free solder reflow processes
- Recommended IR reflow profile:



**How to Order**

1	2	3	4	5	6	7	8	9	10	11	12	13
<b>H</b>	<b>C</b>	<b>S</b>	<b>3</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>F</b>	<b>T</b>	<b>L</b>	<b>3</b>	<b>0</b>	<b>0</b>
Product Series	Size	Power Rating	Tolerance		Packaging				Resistance Value			
HCS	2512	3W	Code	Tol	Code	Description	Size	Quantity	Four characters with "L" used as multiplier of 10 <sup>-3</sup> for any value under 0.1 ohm 0.0003 ohm = L300 0.0005 ohm = L500 0.001 ohm = 1L00			
	3920	5W	F	1%	T	7" Reel - Plastic Tape	2512	4,000				
			J	5%			3920	3,000				