

## Type 3522 Series

**Key Features** 

3 Watts at 70°C

Small size to power ratio

Supplied on tape

Value marked on resistor

Available via distribution

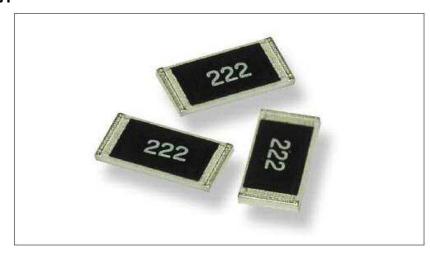
500 volt maximum overload

250 volt working voltage

Terminal finish matte Sn over Ni

AEC-Q200 Qualified

Moisture sensitivity level - MSL1



TE Connectivity is pleased to announce that our 3522 series resistor is now AEC-Q200 qualified. This low cost high power device, suitable for auto placement in volume and for most applications, including high frequency operations, owing to the short lead structure is supplied as standard on 7 inch Reels of 2000 pieces per reel.

**Note:** SMD (Surface mount devices) resistors and inductors should be kept in their original packaging to protect them from ESD (Electrostatic Discharge). The full reels can be broken into smaller quantities, without exposing them to ESD, as long as the components are still in the plastic or paper tape. These resistors and inductors should not be removed from the plastic or paper tape unless they are in an ESD protected environment.

#### **Characteristics – Electrical**

Power rating at 70°C	3W
Rated current (Jumper)	2.5A
Max. overload current (Jumper)	10A
Max working voltage	250V
Max overload voltage	500V
Dielectric withstand voltage	500V
Temperature range	-55°C ~ +155°C
Ambient temperature	70°C
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<sup>\*</sup> Rated continuous working voltage (RCWV) shall be determined from

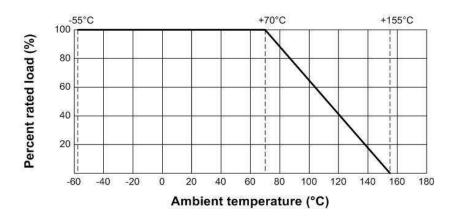
RCWV = V(Rated Power x Resistance Value), or Maximum RCWV listed above, whichever is less

\*\*Recommended Circuit Board Design - If this device is anticipated to run at full continuous power then action to improve the cooling should be taken. This can be a metal substrate, copper pad left under the chip, an opening in the PCB or enlarged silver conductor pads each end.

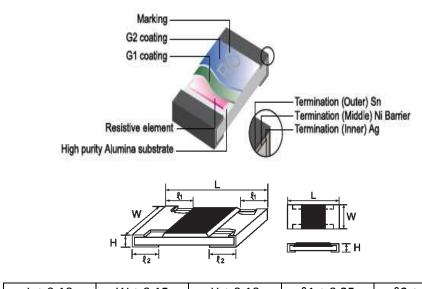


# **Power derating curve**

For resistors operated in ambient temperatures above 70°C, power rating must be derated in accordance with this curve.



### **Construction and dimensions**



L ± 0.10	W ± 0.15	H ± 0.10	<b>ℓ1 ± 0.25</b>	ℓ2 ± 0.20
6.35	3.20	1.10	0.60	1.80

Power rating	Tolerance %	Resistance	Standard series
@70°C		Range	
	Jumper	<50mΩ	
3W	± 1%	1Ω - 10ΜΩ	E96
	± 5%	1Ω - 10ΜΩ	E24



# **Performance specification**

Characteristics	Limits	Test Methods	
		1252, at35% of operating power,	
Operational life	±(1%+0.1Ω)max	1000H(1.5 hours "ON", 0.5 hour	
	,	"OFF"). (MIL-STD-202)	
	<100mΩ	Apply to rate current for $0 \Omega$	
		Parametrically test per lot and	
	$1\Omega \le R \le 10\Omega \le \pm 400PPM/^{\circ}C$	sample size requirements, summary	
Temperature	10Ω< R ≤100Ω ≤ ±200PPM/°C	to show Min, Max, Mean and	
Coefficient of	$100\Omega < R \le 10M\Omega \le$	Standard deviation at room as well as	
Resistance	±100PPM/°C	Min and Max operating	
		temperatures. (User Spec)	
		Electrical test not required. Inspect	
External Visual	No Mochanical Damago	device construction, marking and	
External visual	No Mechanical Damage	workmanship	
		(MIL-STD-883 Method 2009)	
		Verify physical dimensions to the	
Physical	Reference 2.0 Dimension	applicable device detail specification	
dimension	standards	Note: User(s) and Suppliers spec.	
difficition	Standards	Electrical test not required.	
		(JESD22 MH Method JB-100)	
		Note: Add Aqueous wash chemical –	
Resistance to	Marking Unsmeared	OKEM Clean or equivalent.	
solvent	Warking Chameurea	Do not use banned solvents.	
		( MIL-STD-202 Method 215)	
Terminal	Not broken	Force of 1.8kg for 60 seconds.	
Strength		(JIS-C-6429)	
High	±(1%+0.1Ω)max	1000hrs. @T=155°C.Unpowered.	
Temperature		Measurement at 24±2 hours after	
Exposure		test conclusion.	
(storage)	4F0m0	(MIL-STD-202 Method 108)	
	<50mΩ	Apply to rate current for $0 \Omega$ 1000 Cycles (-55°C to +155°C).	
	Resistance change rate is ±(0.5%+0.1Ω) Max	Measurement at 24±2 hours after	
Temperature		test conclusion	
cycling	±(0.570.0.112) Max	(JESD22 Method JA-104)	
	<50mΩ	Apply to rate current for $0 \Omega$	
		Temp_(b)	
Moisture Resistance	Resistance change rate is $\pm (0.5\% + 0.1\Omega)$ Max.	275 25 No. 3 No. 33 No. 25 No. 3 No.	
		T=24 hours /cycle. Unpowered.	
		Measurement at 24±2 hours	
		after test conclusion.	
		(MIL-STD-202 Method 106)	
	<50mΩ	Apply to rate current for 0 Ω	
		10% rated power, 85°C/85% RH,	
Biased Humidity	Resistance change rate is	1000H,	
	$\pm (1\%+0.1\Omega)$ Max.	Measurement at 24 hours after test	
	, ,	conclusion	
		(MIL-STD-202 Method 103)	
	<100mΩ	Apply to rate current for $0 \Omega$	



Mechanical Shock   ±(1%+0.1Ω)max   Shock pulse. Peak value is 100g's shock pulse is 100g's for point. Test from 10-2000Hz. (Mil.STD-202 Method 204)   -55°C/+155°C, Note: Number of cycles required - 300, Maximum transfer time -20 seconds, Dwell time -15 minutes. Air-Air. (Mil.STD-202 Method 107)   -55°C/+155°C, Note: Number of cycles required - 300, Maximum transfer time -20 seconds, Dwell time -15 minutes. Air-Air. (Mil.STD-202 Method 107)   -50mΩ	Characteristics	Limits	Test Methods	
Shock         ±(1%+0.1Ω)max         Normal duration (D) is 6. (MIL-STD-202 Method 213)           Vibration         ±(1%+0.1Ω)max         Sg's for 20 min, 12cycle each of 3 orientations Note: Use 8"S"PCB. 031" thick 7 secure points on one long side and 2 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2' from any secure point. Test from 10-2000Hz. (MIL-STD-202 Method 204)           Thermal Shock         ±(1%+0.1Ω)max         -55°C/+155°C, Note: Number of cycles required - 300, Maximum transfer time -20 seconds, Dwell time -15 minutes. Air-Air. (MIL-STD-202 Method 107)           ESD         ±(10%+0.1Ω)max         With the electrometer in direct contact with the discharge tip, verify the voltage setting at levels of ±500V, ±1KV, ±2KV, ±4KV, ±8KV, The electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (AEC-Q200-002)           For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method 8 Hyrs at ±155°C dry heat, the dip in bath with 245°C, 5s. b) Method b: at 215°C, 5s. c) Method b: at 25°C, 5s. c) Method b: at 25°C, 5s. b) Method B: at 215°C, 5s. c) Method b: at 25°C, 60s. (J-STD-002)           Flame         No flame         2mm (Min) (JIS-C-6429)           Flame Retardance         No flame         2mm (Min) (JIS-C-6429)           Voltage power subjected to 32VDC current clamped up to 500ADC and decreased in 1.0VDC/hour. (AEC-Q200-001)         Condition B No per-heat of samples. Note: Single Wave Solder - Procedure 2 for SMD and Procedure 1 for Leaded with solder within 1.5mm of device body. (MIL-STD-202 Method 210)           Apply to rate current for 0 W				
Normal duration (D) is 6. (MIL-STD-202 Method 213)		1/40/ - 0.40\	shock pulse. Peak value is 100g's.	
Sg's for 20 min., 12cycle each of 3 orientations		±(1%+0.1Ω)max	Normal duration (D) is 6.	
Vibration       ±(1%+0.1Ω)max       orientations Note: Use 8"*5"PCB. 031" thick 7 secure points on one long side and 2 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2' from any secure point. Test from 10-2000Hz. (MIL-STD-202 Method 204) -55°C/+155°C, Note: Number of cycles required - 300, Maximum transfer time -20 seconds, Dwell time -15 minutes. Air-Air. (MIL-STD-202 Method 107)         <50mΩ			(MIL-STD-202 Method 213)	
Vibration       ±(1%+0.1Ω)max       orientations Note: Use 8"*5"PCB. 031" thick 7 secure points on one long side and 2 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2' from any secure point. Test from 10-2000Hz. (MIL-STD-202 Method 204) -55°C/+155°C, Note: Number of cycles required - 300, Maximum transfer time -20 seconds, Dwell time -15 minutes. Air-Air. (MIL-STD-202 Method 107)         <50mΩ				
Secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2' from any secure point.   Thermal Shock   E(1%+0.1Ω)max   Test from 10-2000Hz. (MIL-STD-202 Method 204)			=	
Secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2' from any secure point.   Thermal Shock   E(1%+0.1Ω)max   Test from 10-2000Hz. (MIL-STD-202 Method 204)				
Vibration   ±(1%+0.1Ω)max   secure points at corners of opposite sides. Parts mounted within 2' from any secure point. Test from 10-2000Hz. (MIL-STD-202 Method 204)   -55°C/+155°C, Note: Number of cycles required -300, Maximum transfer time -20 seconds, Dwell time -15 minutes. Air-Air. (MIL-STD-202 Method 107)   <50mΩ   Apply to rate current for 0Ω   With the electrometer in direct contact with the discharge tip, verify the voltage setting at levels of ±500V, ±1KV, ±2KV, ±4KV, ±8KV, The electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (AEC-Q200-002)   For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B: at 215°C, 5s. c) Method D: at 260°C, 60s. (J-STD-002)   Voltage form 500V to 100 (J-STD-002)   Voltage form 500V t				
sides. Parts mounted within 2' from any secure point. Test from 10-2000Hz. (MIL-STD-202 Method 204) -55°C/+155°C, Note: Number of cycles required - 300, Maximum transfer time -20 seconds, Dwell time -15 minutes. Air-Air. (MIL-STD-202 Method 107) <somω 0ω="" apply="" at="" contact="" current="" direct="" discharge="" electrometer="" for="" in="" levels="" of="" rate="" setting="" td="" the="" tip,="" to="" verify="" voltage="" with="" ±1kv,="" ±2kv,="" ±4kv,="" ±4kv,<="" ±500v,=""><td>Vibration</td><td>±(1%+0.1Ω)max</td><td></td></somω>	Vibration	±(1%+0.1Ω)max		
Thermal Shock				
Test from 10-2000Hz. (MIL-STD-202 Method 204) (MIL-STD-202 Method 204) (MIL-STD-202 Method 204) (MIL-STD-202 Method 204) (See required - 300, Maximum transfer time -20 seconds, Dwell time -15 minutes. Air-Air. (MIL-STD-202 Method 107) (MIL-STD-203 Method 210) (MIL-STD-202 Method 210)				
Thermal Shock  tel (1%+0.1Ω) max  tel (10%+0.1Ω) m				
Thermal Shock  tel (1%+0.1Ω) max  tel (10%+0.1Ω) m				
Thermal Shock $\frac{1}{4}(1\%+0.1\Omega) max$ $\frac{1}{4}(1\%+0.1\Omega) max$ $\frac{1}{4}(1\%+0.1\Omega) max$ $\frac{1}{4}(1\%+0.1\Omega) max$ $\frac{1}{4}(1\%+0.1\Omega) max$ $\frac{1}{4}(10\%+0.1\Omega) $				
Thermal Shock $\frac{\pm (1\%+0.1\Omega) max}{\text{Pomp}   \text{Maximum transfer time -20 seconds, } Dwell time -15 minutes. Air-Air. } {\text{(MIL-STD-202 Method 107)}} \\ < 50mΩ & Apply to rate current for 0Ω \\ \hline With the electrometer in direct contact with the discharge tip, verify the voltage setting at levels of \pm (10\%+0.1\Omega) max \pm (10\%+0.1\Omega) max \pm (10\%+0.1\Omega) \pm (10\%+0.1\Omega) \pm (10\%+0.1\Omega) \pm (10\%+0.1\Omega) max \pm (10\%+0.1\Omega) and the discharge tip, verify the voltage setting at levels of \pm 500V, \pm 1KV, \pm 2KV, \pm 4KV, \pm 4KV$				
Dwell time -15 minutes. Air-Air. (MIL-STD-202 Method 107)		+/1%+0.10\may		
(MIL-STD-202 Method 107)   <50mΩ	Thermal Shock	±(1/010.132)///dx		
SOMΩ				
ESD  ±(10%+0.1Ω)max  ±(10%+0.1Ω)max  ±(10%+0.1Ω)max  ESD  ±(10%+0.1Ω)max  ±(10%+0.1Ω)max  ESD  ±(10%+0.1Ω)max   ±(10%+0.1Ω)max    **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (AEC-Q200-002)  **For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245°C, 5s. b) Method B: at 215°C, 5s. c) Method D: at 260°C, 60s. (J-STD-002)  **For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245°C, 5s. b) Method B: at 215°C, 5s. c) Method D: at 260°C, 60s. (J-STD-002)  **For both leaded & SMD. Electrical test not required. (UL-94)  **Electrometer reading shall be within ±245°C, 5s. c) Method D: at 250°C, 60s. (J-STD-002)  **For both leaded & SMD. Electrical test not required. (UL-94)  **Electrometer reading shall be within ±10% for voltages of the pinewood board (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (UL-94)  **Electrometer reading shall be withi		<50m0		
ESD $ = \pm (10\% + 0.1\Omega) max $ contact with the discharge tip, verify the voltage setting at levels of $\pm 500V$ , $\pm 12V$ , $\pm 22V$ , $\pm 42V$ , $\pm 28V$ , The electrometer reading shall be within $\pm 10\%$ for voltages from 500V to $\leq 800V$ . (AEC-Q200-002)  For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245°C, 5s. b) Method B: at 215°C, 5s. c) Method D: at 260°C, 60s. (J-STD-002)  Flammability No ignition of the tissue paper or scorching of the pinewood board (UL-94)  Board Flex $\pm (1\% + 0.05\Omega) max$ 2mm (Min) (JIS-C-6429)		\J011122		
ESD				
ESD $ \frac{\pm (10\% + 0.1\Omega) max}{\pm (10\% + 0.1\Omega) max} = \frac{\pm 500V, \pm 1KV, \pm 2KV, \pm 4KV, \pm 8KV, The}{\pm electrometer reading shall be within} \\ \frac{\pm (10\% + 0.1\Omega) max}{\pm 10\% \text{ for voltages from } 500V \text{ to}} \\ \frac{\pm 8800V.}{8800V.} \\ (AEC-Q200-002) \\ For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4 hrs at 155°C dry heat, the dip in bath with 245°C, 5s. b) Method B: at 215°C, 5s. c) Method D: at 260°C, 60s. (J-STD-002) \\ No ignition of the tissue paper or scorching of the pinewood board (UL-94)  \frac{\pm (1\% + 0.05\Omega) max}{450m\Omega} = \frac{2mm \text{ (Min) (JIS-C-6429)}}{2mm \text{ (Min) (JIS-C-6429)}} \\ - 2mm \text{ (No flame} = \frac{2mm \text{ (No flame)}}{2mm \text{ (Min) (JIS-C-6429)}} \\ - 2mm \text{ (No flame)} = \frac{2mm \text{ (No flame)}}{2mm \text{ (Min) (JIS-C-6429)}} \\ - 2mm \text{ (No flame)} = \frac{2mm \text{ (No flame)}}{2mm \text{ (Min) (JIS-C-6429)}} \\ - 2mm \text{ (No flame)} = \frac{2mm \text{ (No flame)}}{2mm \text{ (Min) (JIS-C-6429)}} \\ - 2mm \text{ (No flame)} = \frac{2mm \text{ (No flame)}}{2mm \text{ (Min) (JIS-C-6429)}} \\ - 2mm \text{ (Min) (JIS-C-6429)} \\ - 2mm \text{ (Min) (JIS-C-6429)}} \\ - 2mm \text{ (Min) (JIS-C-6429)} \\ - 2mm  ($				
ESD  ±(10%+0.1Ω)max electrometer reading shall be within ±10% for voltages from 500V to ≤800V. (AEC-Q200-002)  For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245°C, 5s. b) Method B: at 215°C, 5s. c) Method D: at 260°C, 60s. (J-STD-002)  No ignition of the tissue paper or scorching of the pinewood board  Board Flex    1(1%+0.05Ω)max   2mm (Min) (JIS-C-6429)			5 5	
$\begin{array}{c} \pm 10\% \                                   $	ESD	±(10%+0.1Ω)max		
Solderability  Solderability  P5% coverage Min.  Soldering Heat  Solderability  P5% coverage Min.  Solderability  P5% coverage Min.  Soldering Heat  Solderability  P5% coverage Min.  Soldering Heat  Solderability  P5% coverage Min.  Soldering Heat  Solderability  Solderability  Soldering Heat  Solderability  Sol				
Solderability   95% coverage Min.   For both leaded & SMD. Electrical test not required.   Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245°C, 5s. b) Method B: at 215°C, 5s. c) Method D: at 260°C, 60s. (J-STD-002)			_	
Solderability   95% coverage Min.   For both leaded & SMD. Electrical test not required.   Magnification 50X. Conditions:   a) Method B 4hrs at 155°C dry heat, the dip in bath with 245°C, 5s.   b) Method B: at 215°C, 5s.   c) Method D: at 260°C, 60s. (J-STD-002)				
$Solderability \\ Solderability \\ Solderabilit$			·	
Solderability   95% coverage Min.   Magnification 50X. Conditions:   a) Method B 4hrs at 155°C dry heat, the dip in bath with 245°C, 5s. b) Method B: at 215°C, 5s. c) Method D: at 260°C, 60s. (J-STD-002)				
Solderability  95% coverage Min.  a) Method B 4hrs at 155°C dry heat, the dip in bath with 245°C, 5s. b) Method B: at 215°C, 5s. c) Method D: at 260°C, 60s. (J-STD-002)  No ignition of the tissue paper or scorching of the pinewood board  Electrical test not required. (UL-94)  **Electrical test not required. (UL-94)  **Ele				
Soliderability   95% coverage Min.   the dip in bath with 245°C, 5s.   b) Method B: at 215°C, 5s.   c) Method D: at 260°C, 60s.   (J-STD-002)			_	
The dip in bath with 245°C, 5s. b) Method B: at 215°C, 5s. c) Method D: at 260°C, 60s. (J-STD-002)    No ignition of the tissue paper or scorching of the pinewood board (UL-94)   Board Flex   $\pm (1\%+0.05\Omega)$ max   $\pm (1\%+0.05\Omega)$	Solderability	95% coverage Min.		
c) Method D: at 260°C, 60s. (J-STD-002)FlammabilityNo ignition of the tissue paper or scorching of the pinewood boardV-0 or V-1 are acceptable. Electrical test not required. (UL-94)Board Flex $\pm (1\%+0.05\Omega)$ max $2mm \text{ (Min) (JIS-C-6429)}$ Flame RetardanceApply to rate current for $0\Omega$ Flame RetardanceTemperature sensing at $500^{\circ}$ C, Voltage power subjected to $32\text{VDC}$ current clamped up to $500\text{ADC}$ and decreased in $1.0\text{VDC/hour.}$ (AEC-Q200-001)Resistance to Soldering Heat $\pm (1\%+0.05\Omega)$ max.Condition B No per-heat of samples. Note: Single Wave Solder - Procedure 2 for SMD and Procedure 1 for Leaded with solder within $1.5\text{mm}$ of device body. (MIL-STD-202 Method 210)<50m $\Omega$ Apply to rate current for $0$ W	<b>,</b>		· · · · · · · · · · · · · · · · · · ·	
Flammability			1 · · ·	
Flammability & No ignition of the tissue paper or scorching of the pinewood board $ $				
Flammability       or scorching of the pinewood board       test not required. (UL-94)         Board Flex $\pm (1\%+0.05\Omega)$ max       2mm (Min) (JIS-C-6429) $<50m\Omega$ Apply to rate current for $0\Omega$ Flame Retardance       No flame       Temperature sensing at $500^{\circ}$ C, Voltage power subjected to $32$ VDC current clamped up to $500$ ADC and decreased in $1.0$ VDC/hour. (AEC-Q200-001)         Resistance to Soldering Heat $\pm (1\%+0.05\Omega)$ max.       Condition B No per-heat of samples. Note: Single Wave Solder - Procedure 2 for SMD and Procedure 1 for Leaded with solder within $1.5$ mm of device body. (MIL-STD-202 Method 210) $<50m\Omega$ Apply to rate current for $0$ W				
			· ·	
Board Flex $\pm (1\%+0.05\Omega)$ max $2$ mm (Min) (JIS-C-6429)         Flame Retardance       No flame       Temperature sensing at 500°C, Voltage power subjected to 32VDC current clamped up to 500ADC and decreased in 1.0VDC/hour. (AEC-Q200-001)         Resistance to Soldering Heat $\pm (1\%+0.05\Omega)$ max.       Condition B No per-heat of samples. Note: Single Wave Solder - Procedure 2 for SMD and Procedure 1 for Leaded with solder within 1.5mm of device body. (MIL-STD-202 Method 210)         C50mΩ       Apply to rate current for 0 W	Flammability		•	
Flame Retardance No flame				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Board Flex			
Flame Retardance No flame Voltage power subjected to 32VDC current clamped up to 500ADC and decreased in 1.0VDC/hour. (AEC-Q200-001) Condition B No per-heat of samples. Note: Single Wave Solder - Procedure 2 for SMD and Procedure 1 for Leaded with solder within 1.5mm of device body. (MIL-STD-202 Method 210) $ < 50m\Omega  $ Apply to rate current for 0 W		<50mΩ		
Retardance No flame current clamped up to 500ADC and decreased in 1.0VDC/hour. (AEC-Q200-001) Condition B No per-heat of samples. Note: Single Wave Solder - Procedure 2 for SMD and Procedure 1 for Leaded with solder within 1.5mm of device body. (MIL-STD-202 Method 210) $<50m\Omega$ Apply to rate current for 0 W				
Retardance No flame current clamped up to 500ADC and decreased in 1.0VDC/hour. (AEC-Q200-001) Condition B No per-heat of samples. Note: Single Wave Solder - Procedure 2 for SMD and Procedure 1 for Leaded with solder within 1.5mm of device body. (MIL-STD-202 Method 210) $<50m\Omega$ Apply to rate current for 0 W	Flame			
$\begin{array}{c} \text{decreased in 1.0VDC/hour.} \\ \text{(AEC-Q200-001)} \\ \text{Condition B No per-heat of samples.} \\ \text{Note: Single Wave Solder - Procedure} \\ \text{2 for SMD and Procedure 1 for} \\ \text{Leaded with solder within 1.5mm of} \\ \text{device body.} \\ \text{(MIL-STD-202 Method 210)} \\ \text{<50m}\Omega \\ \end{array}$		No flame	· · ·	
Condition B No per-heat of samples. Note: Single Wave Solder - Procedure 2 for SMD and Procedure 1 for Leaded with solder within 1.5mm of device body. (MIL-STD-202 Method 210) $<50m\Omega$ Apply to rate current for 0 W				
Resistance to Soldering Heat $ \begin{array}{c} \text{Resistance to} \\ \text{Soldering Heat} \end{array} \begin{array}{c} \pm (1\% + 0.05\Omega) \text{ max.} \end{array} \begin{array}{c} \text{Note: Single Wave Solder - Procedure} \\ 2 \text{ for SMD and Procedure 1 for} \\ \text{Leaded with solder within 1.5mm of} \\ \text{device body.} \\ \text{(MIL-STD-202 Method 210)} \\ \text{<50m}\Omega \end{array} $				
Resistance to Soldering Heat $ \begin{array}{c} \pm (1\% + 0.05\Omega) \text{ max.} & 2 \text{ for SMD and Procedure 1 for} \\ \text{Leaded with solder within 1.5mm of} \\ \text{device body.} \\ \text{(MIL-STD-202 Method 210)} \\ \text{<} 50 \text{m}\Omega & \text{Apply to rate current for 0 W} \end{array} $		±(1%+0.05Ω) max.		
Soldering Heat $ \begin{array}{c} \pm (1\% + 0.05\Omega) \text{ max.} \\ & \text{Leaded with solder within 1.5mm of} \\ & \text{device body.} \\ & \text{(MIL-STD-202 Method 210)} \\ & \text{<50m}\Omega \\ \end{array} $				
Soldering Heat Leaded with solder within 1.5mm of device body. (MIL-STD-202 Method 210) $<50\text{m}\Omega$ Apply to rate current for 0 W			2 for SMD and Procedure 1 for	
(MIL-STD-202 Method 210)       <50mΩ			Leaded with solder within 1.5mm of	
<50mΩ Apply to rate current for 0 W			device body.	
			(MIL-STD-202 Method 210)	
		<50mΩ	Apply to rate current for 0 W	
	* Sulfuration test	: H2S 3~5PPM 50 ±2 91%~93%RH 1	000H	



## Marking:

Marking for E-96 series in 2512 size: 4 digit marking

First three digits are significant figures of resistance and the fourth digit represents the number of following zeros. N.B. For values below  $100\Omega$  the letter R denotes decimal point eg.  $1R80 = 1.8\Omega$ 



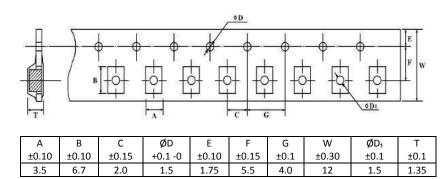
Marking for E-24 series in 2512 size: 3 digit marking

First two digits are significant figures, and the third digit represents the number of zeros



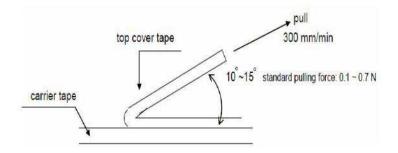
# **Packing specification:**

### Taping dimensions (mm)



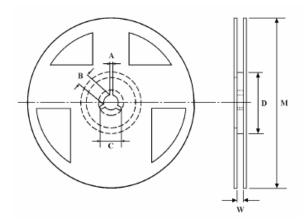
#### **Peeling strength of Top Cover Tape**

Test Condition 0.1 to 0.7 N at a peel-off speed of 300mm / min.





#### Reel dimension (mm)



Qty / Reel	A ±0.5	B ±0.5	C ±0.5	D ±1	M ±2	W ±1
2000	2	13	21	60	178	13.5

#### **Environment Related Substance**

This product complies to EU RoHS directive, EU PAHs directive, EU PFOS directive and Halogen free.

#### Ozone layer depleting substances.

Ozone depleting substances are not used in our manufacturing process of this product.

This product is not manufactured using Chlorofluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs), Hydrobromofluorocarbons (HBFCs) or other ozone depleting substances in any phase of the manufacturing process.

#### **Storage Condition**

The performance of these products, including the solderability, is guaranteed for a year from the date of arrival at your company, provided that they remain packed as they were when delivered and stored at a temperature of  $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$  and a relative humidity of  $60\%\text{RH} \pm 10\%\text{RH}$ , chemical and dust free atmosphere

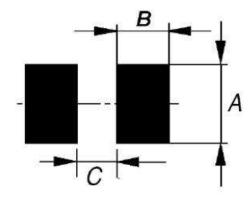
Even within the above guarantee periods, do not store these products in the following conditions, otherwise, their electrical performance and/or solderability may be deteriorated, and the packaging materials (e.g. taping materials) may be deformed or deteriorated, resulting in mounting failures.

1. In salty air or in air with a high concentration of corrosive gas, such as Cl2, H2S, NH3, SO2, or NO2

2. In direct sunlight



# **Recommended solder pad**



Α	В	С
3.70	3.30	2.70

4 layers PCB specification:

- 1) Outside 2 layers (Top and Bottom) with copper foil thickness at 2oz.
- 2) Inside 2 layers (Middle layers) with copper foil thickness at 4 oz.

# AEC-Q200

The 3522 series is qualified to AEC-Q200 standard at Grade"4"

### **How To Order**

3522	1K0	F	T
<b>Common Part</b>	Resistance Value	Tolerance	Pack Style
	1 ohm 1R0		
3522	1K ohm 1000 ohms 1K0	F – 1% J – 5%	T – 2000 reel
	1 Meg ohm		
	1000000 ohms		
	1M0		