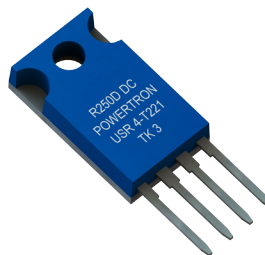


FEATURES

- Resistances from 0.2Ohm to 80Ohms
- Power Rating to 15Watt
- Resistance Tolerances to $\pm 0.01\%$
- TCR to $\pm 1\text{ppm/K}$
- Load Stability to 0.01%



RoHS*
COMPLIANT

TABLE 1 – SPECIFICATIONS			
TYPE		USR 4-T220B USR 4-T221	UNR 4-T220B UNR 4-T221
Resistance Range		0.2 to 80 Ohms	
Power Rating	Free air 70°C	1.5W	
	With heatsink	10W	15W
Tolerances		0.1% / 0.25% / 0.5% / 1%	
from 0.2 Ohms		0.05% / 0.1% / 0.25% / 0.5% / 1%	
from 10.0 Ohms		0.01% / 0.02% / 0.05% / 0.1% / 0.25% / 0.5% / 1%	
from 50.0 Ohms			
Thermal Resistance		10.8 K/W	6.8 K/W
Stability (1000h)		0.01%	
Temperature Coefficient		max. $\pm 5\text{ppm/K}$ (-55 to 155°C) typ. $\pm 3\text{ppm/K}$ (-55 to 125°C) upon request $\pm 1\text{ppm/K}$ (25 to 60°C)	
Shelf Life Stability		25ppm / ΔR after 1 year 50ppm / ΔR after 3 year	
Voltage Proof		1 kVDC	
Thermal EMF		< 0.1 $\mu\text{V/K}$	
Operating Temperature Range		-55 to 155°C	
Resistor Material		NiCr-Foil	
Substrate		Al ₂ O ₃	AlN
Housing		Epoxy + Cu heatsink nickel plated	
Connector Material		Cu / tinned	
Terminals		4	
Max. Torque		1 Nm	
Notes		Specially designed for applications with fast changing electrical load	

ORDERING INFORMATION
Part Number - Resistance - Contact - Tolerance - TCR (if not standard)
UNR 4-T220B 78R000 C 0.5%
UNR 4-T220B 15K000 S 0.5% 1ppm/K (25 to 60°C)

FIGURE 1 – TEMPERATURE COEFFICIENT

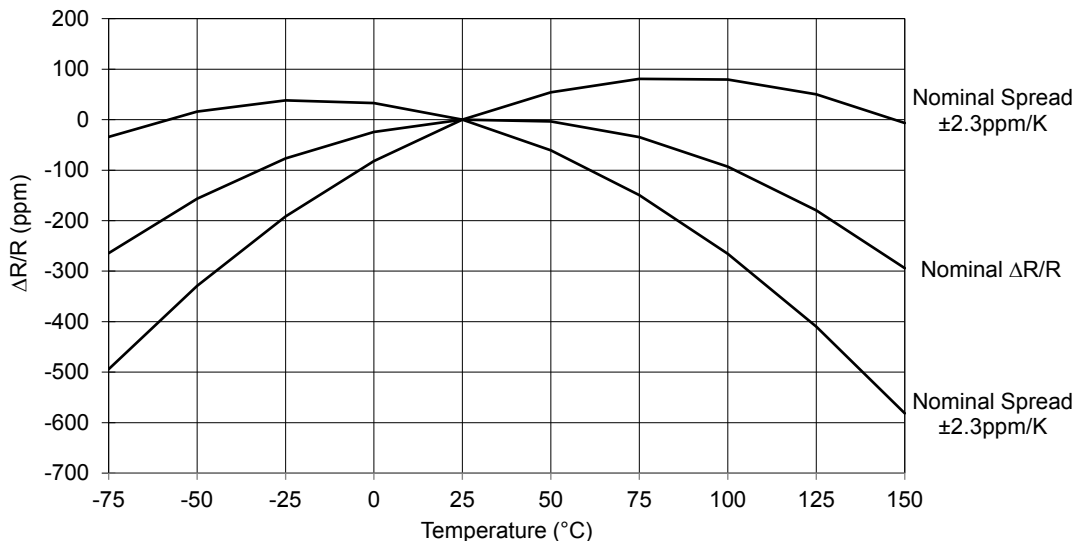
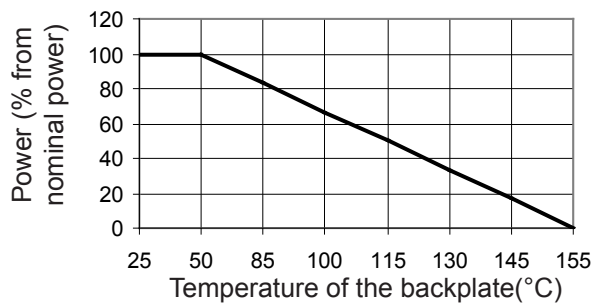


FIGURE 2 – DERATING



Power Rating Notes -

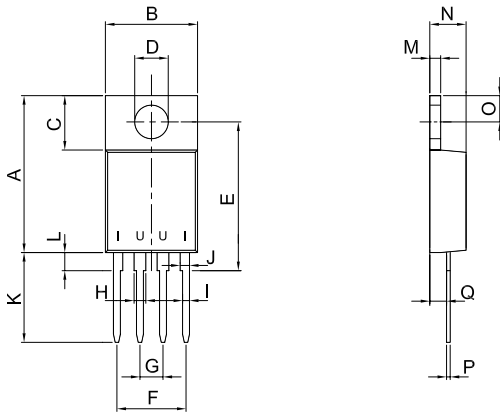
The U-Series Resistors must be attached to a suitable heatsink. The maximum internal resistor temperature is 155°C. To specify an appropriate heatsink use the following formula :

$$R_{\theta H} = \frac{T_{MAX} - (P \times R_{\theta R}) - T_A}{P}$$

Where: $R_{\theta H}$ = Thermal Resistance of Heatsink (K/W)
 $R_{\theta R}$ = Thermal Resistance of Resistor (K/W)
 T_{MAX} = Maximum Temperature of Resistor
 T_A = Ambient Temperature of Heatsink (°C)
 P = Power Through Resistor (W)

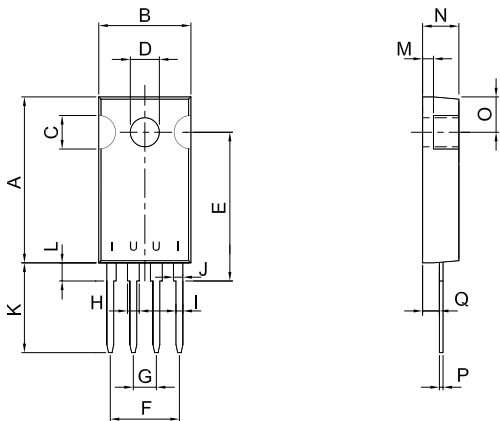
FIGURE 3—DIMENSIONS in mm (inches)

USR 4-T220 / UNR 4-T220



Dimension	Standard contact S	C-contact
A ±0.2 (±0.008)	17.30 (0.68)	
B ±0.2 (±0.008)	10.16 (0.40)	
C ±0.1 (±0.004)	6.00 (0.24)	
D ±0.1 (±0.004)	Ø3.7 (Ø0.146)	
E ±0.2 (±0.008)	16.40 (0.65)	
F ±0.2 (±0.008)	7.62 (0.30)	
G ±0.1 (±0.004)	2.54 (0.10)	
H ±0.1 (±0.004)	1.30 (0.05)	
I ±0.1 (±0.004)	0.76 (0.03)	
J ±0.1 (±0.004)	1.03 (0.04)	
K ±0.2 (±0.008)	10.00 (0.39)	13.80 (0.54)
L ±0.1 (±0.004)	2.00 (0.08)	
M ±0.1 (±0.004)	1.20 (0.05)	
N ±0.1 (±0.004)	4.00 (0.16)	
O ±0.1 (±0.004)	2.90 (0.11)	
P ±0.1 (±0.004)	0.40 (0.02)	
Q ±0.1 (±0.004)	1.85 (0.07)	

USR 4-T221 / UNR 4-T221



Dimension	Standard contact S	C-contact
A ±0.2 (±0.008)	18.30 (0.72)	
B ±0.2 (±0.008)	10.16 (0.40)	
C ±0.1 (±0.004)	3.70 (0.15)	
D ±0.1 (±0.004)	Ø3.2 (Ø0.126)	
E ±0.2 (±0.008)	16.40 (0.65)	
F ±0.2 (±0.008)	7.62 (0.30)	
G ±0.1 (±0.004)	2.54 (0.10)	
H ±0.1 (±0.004)	1.30 (0.05)	
I ±0.1 (±0.004)	0.76 (0.03)	
J ±0.1 (±0.004)	1.03 (0.04)	
K ±0.2 (±0.008)	10.00 (0.39)	13.80 (0.54)
L ±0.1 (±0.004)	2.00 (0.08)	
M ±0.1 (±0.004)	1.20 (0.05)	
N ±0.1 (±0.004)	4.00 (0.16)	
O ±0.1 (±0.004)	3.90 (0.15)	
P ±0.1 (±0.004)	0.40 (0.02)	
Q ±0.1 (±0.004)	1.85 (0.07)	

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