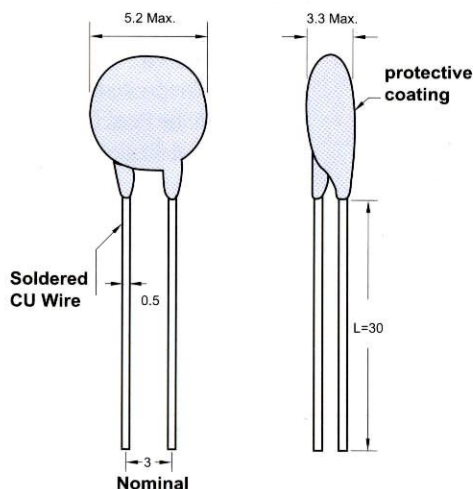




# LMEM NTC THERMISTOR SENSOR

## FOR TEMPERATURE COMPENSATION 5 m/m $\phi$ NTC SERIES



- B-Constant deviation:  $\pm 3\%$  (Calculated by R25 and R50)
- Thermal dissipation factor:  $6.5\text{mw}/^\circ\text{C}$
- Operation temp. range:  $-55\sim 150^\circ\text{C}$
- Thermal time constant: 20 sec.
- Max. Allowable power ( $25^\circ\text{C}$ ): 0.55W

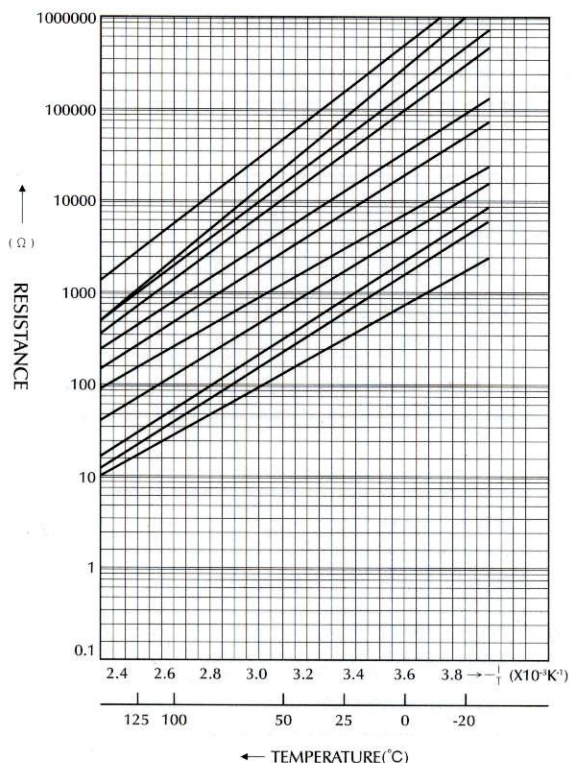
### HOW TO ORDER

LM	05	103	J
LMEM THERMISTOR	DIAMETER $5\phi$	RESISTANCE CODE ( $\Omega$ )	TOLERANCE

#### Resistance Tolerance

F	$\pm 1\%$
G	$\pm 2\%$
H	$\pm 3\%$
J	$\pm 5\%$
K	$\pm 10\%$
L	$\pm 15\%$

### R/T CHARACTERISTICS



PART NO.	PESISTANCE AT 25°C ( $\Omega$ )	B CONSTANT 25/50°C (K)	RESISTANCE TEMP. COEFF 25°C (%/°C)
LM05050	5	2960	-3.3
LM05150	15	2960	-3.3
LM05450	45	2960	-3.3
LM05700	70	3150	-3.5
LM05900	90	3150	-3.5
LM05101	100	3150	-3.5
LM05121	120	3150	-3.5
LM05151	150	3150	-3.5
LM05201	200	3150	-3.5
LM05221	220	3150	-3.5
LM05251	250	3450	-3.8
LM05271	270	3450	-3.8
LM05301	300	3450	-3.8
LM05401	400	3450	-3.8
LM05501	500	3450	-3.8
LM05681	680	3450	-3.8
LM05102	1000	3650	-4.0
LM05152	1500	3650	-4.0
LM05202	2000	3950	-4.4
LM05252	2500	3950	-4.4
LM05302	3000	3950	-4.4
LM05402	4000	3950	-4.4
LM05502	5000	3950	-4.4
LM05682	6800	3950	-4.4
LM05103	10000	4100	-4.6
LM05153	15000	4200	-4.7
LM05203	20000	4200	-4.7
LM05303	30000	4200	-4.7
LM05503	50000	4200	-4.7
LM05683	68000	4400	-4.9
LM05104	100000	4400	-4.9
LM05154	150000	4400	-4.9
LM05204	200000	4400	-4.9
LM05304	300000	4700	-5.2
LM05504	500000	4700	-5.2

### PHYSICAL PROPERTIES

#### \*RESISTANCE-TEMPERATURE CHARACTERISTICS

of the thermistors is the relation between resistance & temperature, the expression as follows:

$$(1) R_1 = R_2 \exp B(1/T_1 - 1/T_2)$$

WHERE:  $R_1$  is the resistance value at absolute temperature  $T_1$

$R_2$  is the resistance value at absolute temperature  $T_2$

$B$  is a constant depending on each thermistor

(2) According to the above formula,  $B$  can be expressed

$$\text{by: } B = \ln(R_1/R_2) / (1/T_1 - 1/T_2)$$

#### \*TEMPERATURE COEFFICIENT OF RESISTANCE

( $\alpha$ ) originates from the above formula (1) the expression as follows:  $\alpha = -B/T^2$

#### \*DISSIPATION CONSTANT( $\delta$ ) is defined for power

in milliwatts necessary for raising temperature of the thermistor by  $1^\circ\text{C}$  as follows:

$$\delta = P / \Delta t (\text{mW}/^\circ\text{C}) \quad (P: \text{POWR}, \Delta t: \text{raise temperature})$$

#### \*TIME CONSTANT(T.C.) is regard as the time required

for a thermistor to change 63% of the difference between its initial and final temperature.



**LMEM NTC SENSOR THERMISTOR ASSEMBLES**



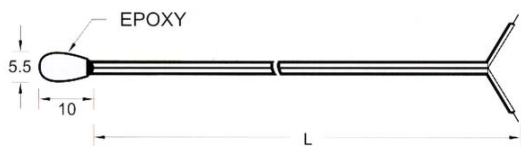
**Typical Applications**

- Electronic thermometers
- Air Conditioners
- Refrigerators
- Copy Machines
- Thermostats
- Smoke Detectors
- Bearing Overtemp Protection
- Chiller Sensors
- Heat Pump Sensors
- Fan Motor Speed Control
- Energy Efficient Monitors
- Differential Temperature Control
- Ambient Temperature Compensation
- Thermocouple Cold-junction Compensation
- Gain Stabilization
- Transistor Temperature Compensation
- Thermal Printer Head Control
- Oscillator Stabilization

LOYAL well-experienced engineers could design various assemblies according to customer's request. The designs could be ultra miniature chip probes or large units with special leads and cable assemblies or standard screw mount fixtures.

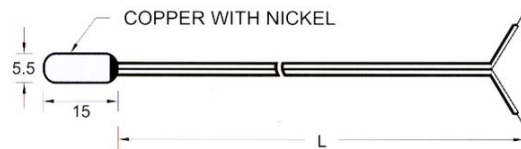
**DIMENSION:(mm)**

**TYPE-5E10**



OPERATING TEMP. RANGE	-25°C ~+95°C	THERMAL TIME CONS.	LESS 25 SEC. (STILL AIR)
INSULATION RESISTANCE	DC500V, 100MΩ/MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-5CN15**



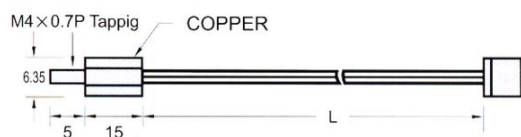
OPERATING TEMP. RANGE	-25°C ~+105°C	THERMAL TIME CONS.	ABOUT 8 SEC. (UNDER WATER)
INSULATION RESISTANCE	DC500V, 100MΩ/MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-5C25**



OPERATING TEMP. RANGE	-30°C ~+105°C	THERMAL TIME CONS.	ABOUT 10 SEC. (UNDER WATER)
INSULATION RESISTANCE	DC500V, 100MΩ/MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-5CT15**



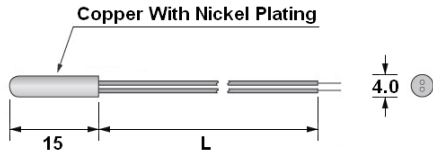
OPERATING TEMP. RANGE	-30°C ~+105°C	THERMAL TIME CONS.	ABOUT 10 SEC. (UNDER WATER)
INSULATION RESISTANCE	DC500V, 100MΩ/MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		



**LMEM NTC SENSOR THERMISTOR ASSEMBLES**

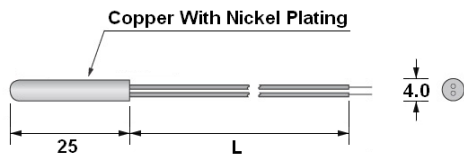
**DIMENSION:(mm)**

**TYPE-3CN15**



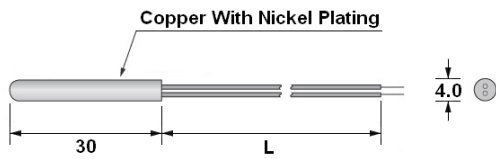
OPERATING TEMP. RANGE	-30°C~+105°C	THERMAL TIME CONS.	LESS 20 SEC. (STILL AIR)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-3CN25**



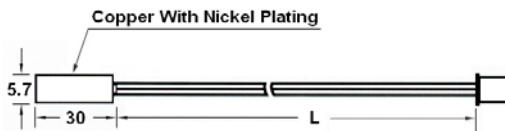
OPERATING TEMP. RANGE	-30°C~+105°C	THERMAL TIME CONS.	LESS 7 SEC. (UNDER WATER)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-3CN30**



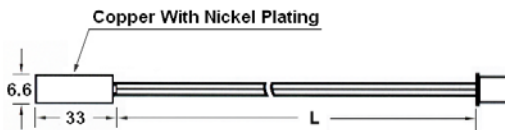
OPERATING TEMP. RANGE	-30°C~+105°C	THERMAL TIME CONS.	LESS 7 SEC. (UNDER WATER)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-5C30**



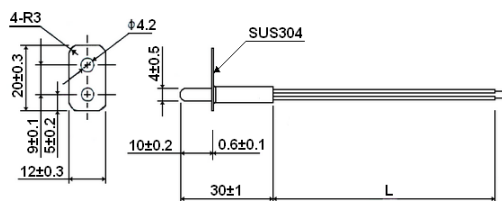
OPERATING TEMP. RANGE	-30°C~+105°C	THERMAL TIME CONS.	LESS 10 SEC. (UNDER WATER)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-5C33**



OPERATING TEMP. RANGE	-30°C~+105°C	THERMAL TIME CONS.	LESS 11 SEC. (UNDER WATER)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-ST30**



OPERATING TEMP. RANGE	-30°C~+250°C	THERMAL TIME CONS.	LESS 25 SEC. (STILL AIR)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

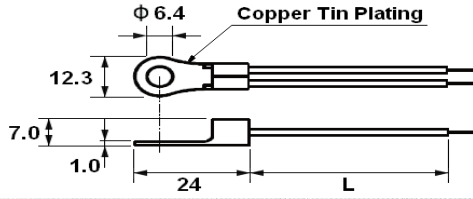




**LMEM NTC SENSOR THERMISTOR ASSEMBLES**

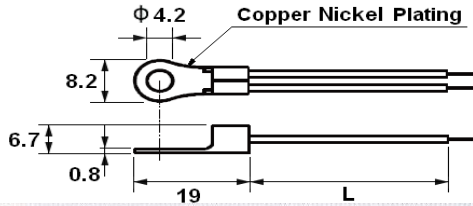
**DIMENSION:(mm)**

**TYPE-5CR24**



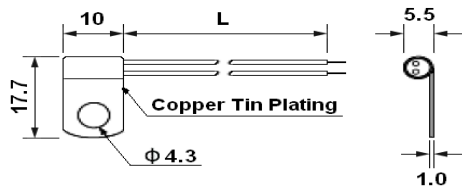
OPERATING TEMP. RANGE	-30°C~+115°C	THERMAL TIME CONS.	LESS 26 SEC. (STILL AIR)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-5CR19**



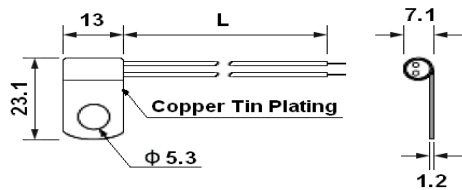
OPERATING TEMP. RANGE	-30°C~+115°C	THERMAL TIME CONS.	LESS 24 SEC. (STILL AIR)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-3CF10**



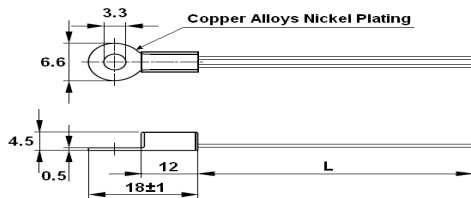
OPERATING TEMP. RANGE	-30°C~+115°C	THERMAL TIME CONS.	LESS 25 SEC. (STILL AIR)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-5CF13**



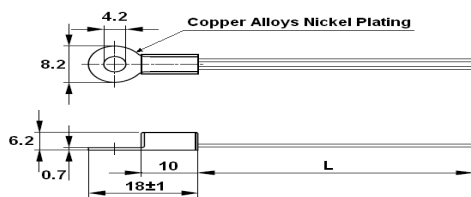
OPERATING TEMP. RANGE	-30°C~+115°C	THERMAL TIME CONS.	LESS 26 SEC. (STILL AIR)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-3CR18**



OPERATING TEMP. RANGE	-30°C~+115°C	THERMAL TIME CONS.	LESS 20 SEC. (STILL AIR)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-5CR18**



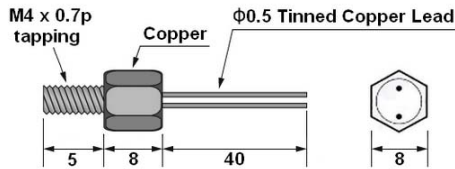
OPERATING TEMP. RANGE	-30°C~+115°C	THERMAL TIME CONS.	LESS 22 SEC. (STILL AIR)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		



**LMEM NTC SENSOR THERMISTOR ASSEMBLES**

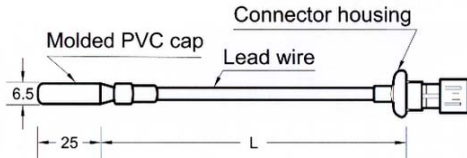
**DIMENSION:(mm)**

**TYPE-5CT8**



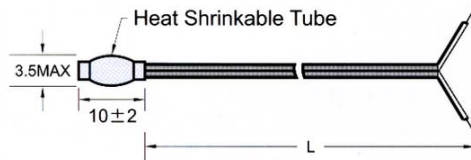
OPERATING TEMP. RANGE	-40°C~+125°C	THERMAL TIME CONS.	ABOUT 18 SEC.
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-5P25**



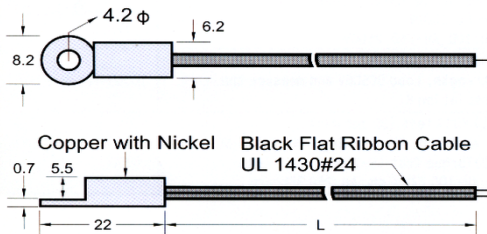
OPERATING TEMP. RANGE	-40°C~+65°C	THERMAL TIME CONS.	ABOUT 15 SEC. (UNDER WATER)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 4500V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-5HST**



OPERATING TEMP. RANGE	-30°C~+115°C	THERMAL TIME CONS.	LESS 20 SEC. (STILL AIR)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**TYPE-5CR22**



OPERATING TEMP. RANGE	-30°C~+115°C	THERMAL TIME CONS.	LESS 25 SEC. (STILL AIR)
INSULATION RESISTANCE	DC500V, 100MΩ MIN	DIELECTRIC STRENGTH	AC 1000V 1 SEC.
LEAD OPTION	A : UL1430 OR UL2651 (105°C) B : UL2468 (80°C) C : UL2464 CABLE (80°C) D : UL1332 FEP TEFLON (200°C) E : 0.5 φ TINNED COPPER LEAD		

**HOW TO ORDER**

5	C25	103	J	200	A
NTC DIAMETER	MATERIAL AND LENGTH	RESISTANCES	TOLERANCE	LENGTH OF LEAD	LEAD OPTION

\*LENGTH OF CABLE AND HOUSING UPON THE CUSTOMER'S INQUIRY.

F	± 1%
G	± 2%
H	± 3%
J	± 5%
K	± 10%