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## COMPONENT TEST CONDITIONS

**PRODUCTS: CERAMIC CAPACITORS  
LEADED (NCM & NCMA series) AND SURFACE MOUNT (MLCC)**

**INDUSTRY STANDARDS:** EIA-198-1F & JIS C 5101

CHARACTERISTIC	TC	TEST CONDITIONS (@ +25°C)
<b>CAPACITANCE</b>	<b>CLASS I</b>	C ≤1000pF @ 1MHZ, 1.2VRMS MAXIMUM
<b>DISSIPATION FACTOR</b>		C >1000pF @ 1KHZ, 1.2VRMS MAXIMUM
<b>CAPACITANCE</b>	<b>CLASS II</b>	1KHZ, 1.0 ±0.2 VRMS (C ≤10uF)
<b>DISSIPATION FACTOR</b>		120Hz, 0.5 ±0.2 VRMS (C >10uF)
<b>CAPACITANCE</b>	<b>CLASS III</b>	Y5V @ 1KHZ, 1.0 ±0.2 VRMS
<b>DISSIPATION FACTOR</b>		ALL OTHERS @ 1KHZ, 0.5 ±0.2 VRMS
<b>INSULATION RESISTANCE</b>	<b>ALL</b>	AFTER 2 MINUTES AT RATED VDC
<b>DIELECTRIC WITHSTAND VOLTAGE</b>	<b>ALL</b>	125% ~ 400%* RATED VOLTAGE FOR 5 ±1 SECONDS

**SPECIFICATION LIMITS:** See NIC specification data sheets

**TC:** Temperature Coefficients

**CLASS I:** NPO(COG), N150, SL(N330), N470, N750, N1500 & N3300

**CLASS II:** X7R, X5R, Y5F, Y5P & Y5R

**CLASS III:** Y5S, Y5T, Y5V, Z5U & Z5V

\* - As specified; see NIC specification data sheets

### HIGH- CAPACITANCE MLCCs (C ≥ 1uF X5R, X7R, Y5V) :

- High-capacitance value MLCCs can present measurement challenges to some test equipment. Common capacitance value errors are caused by the low impedance of high capacitance MLCCs, often resulting to greatly reduce the test signal across the device under test (DUT).
- TEST EQUIPMENT: Agilent HP4284A Precision LCR meter
  - This LCR meter has "ALC" automatic level control feature that compensates for DUT loading
  - If "ALC" function is disabled, the DUT impedance can be seen to greatly reduce the test level and result in incorrect capacitance measurement
  - EXAMPLE: 10uF MLCCs ... NIC P/N: NMC1206Y5V106Z10 or NMC0805X5R106K6.3
  - Test Level set at 1.0Vrms
  - With ALC **OFF**, test level drops to 0.2Vrms upon DUT insertion and incorrect capacitance measurement of "7.24uF"
  - With ALC **ON**, test level is maintained at 1.0Vrms upon DUT insertion and correct capacitance measurement of "10.08uF"

### RECOMMENDATION:

- Monitor (measure) and adjust test level to achieve correct test level across DUT, see EIA-198-1F test conditions table above.
- For guidance, please contact NIC technical support personnel [tpmq@niccomp.com](mailto:tpmq@niccomp.com)