FX-100 Leak voltage and Tip-to-ground resistance

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There are some standards as follows which define leak voltage and tip-to-ground resistance.

＊Applicable standard

	ANSI ESD S20.20-2007 (SMT13.1-2000)	J STD-001D	MIL-STD-2000
Tip-to-ground resistance	2Ω or less	5Ω or less	5Ω or less
Leak voltage	20mV RMS or less	n/a	20mV RMS or less
Leak currency	10mA AC or less	n/a	n/a
Transient voltage	not described	2V peak or less	not described

＊Leak voltage

Leak voltage is specified by ANSI ESD S20.20-2007 and MIL-STD-2000. The measuring method is described in details in each standard, but it is presumed that the leak voltage of the object to be measured (FX-100) does not differ among each standard. Each standard is referring to measuring instrument specifically, but there's no mention about frequency character of measuring instrument. However, we see the model number of the measuring instrument in MIL-STD-2000, and we can identify the frequency character referring to the document of the instrument. They are model 3400A from Hewlett-Packard and model 132F from Keithly. (MID-STD-2000 was abolished already)

According to the manual of the model 3400A made by Hewlett-Packard, the frequency range is 10Hz to 10MHz. This means that the measuring instrument can measure AC voltage for the said frequency range. Therefore, MTD-STD-2000 is describing exclusively how to measure the leak voltage from commercial electric power supply. It seems that other standards follow MIL-STD-2000.

＊Tip-to-ground resistance

The measuring method is described in details in each standard, but it is presumed that the tip-to ground resistance value of the object to be measured (FX-100) does not differ among each standard.

＊Measuring Leak voltage and Tip-to ground resistance by soldering iron tester

	HAKKO 192	FG-101	Wahl ST2200
Leak voltage	0.3mVAC RMS	0.3mVAC RMS	0.34mVAC RMS
Tip-to-ground resistance	0.3Ω	0.3Ω	0.43Ω
Transient voltage	--	--	OK

＊IC made by Analog Device is used for the RMS-DC conversion IC which is positioned at the front end of leak voltage measuring circuit of soldering iron testers.
This IC is to measure AC voltage precisely and convert into DC voltage. The maximum frequency range of this IC will be about 100KHz to 1.2MHz, though it depends on input voltage.
It is possible to make measurement according to the method regulated by each standard within the said frequency range.

＊When the transient voltage is measured by Wahl ST2200 and the peak voltage greater than 100mV is found with pulsive voltage more than 1 μS, it should be rejected.

Referring to the results above, we can conclude that leak voltage and the tip-to-ground resistance value can be shown as the specification.

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