ANSI-ASC-C63® Interpretation Request Form

This form shall be used for submission of Interpretation Requests related to ANSI-IEEE standards that are within the responsibility of ANSI-ASC-C63®. The eight parts of the form must be filled out completely, with the exception of the Subcommittee Response, to ensure expedient processing. This completed form is to be submitted to the Secretary of ANSI-ASC-C63® via e-mail.

Submission Date	Originator Name, Company
05/20/2015	Bob DeLisi, UL

Standard	Clause/ Sub clause	Paragraph Figure/ Table	Type (General/ Technical/ Editorial)	Comment / Inquiry	Subcommittee Response (to be filled in by Subcommittee Chair)
C63.10:2013	6.3.4			Clause 6.3.4 states "For radiated emission test data reporting, both plots and tabular data shall be included". What is the definition of the term plot? SC RESPONSE: SEE THIS ROW RIGHT-COLUMN OF THIS MATRIX. We have attached 3 examples and would like to know which are acceptable for satisfying the term plot (see next page) SC RESPONSE: SEE NEXT ROW OF THIS MATRIX.	6.3.4 of ANSI C63.10-2013 requires reporting the results of radiated emissions testing in a graphical representation based on the acquired tabular data. Both plots and tabular data shall be reported. In this context, the term plot means a graphical representation of a series of data sufficient to show the trend of emissions characteristics of the device being tested. For completeness it is noted also that 6.3.4 cross-references Clause 15 of ANSI C63.10-2013 ("Data content and format shall conform to the requirements specified in Clause 15."); Clause 15 cross-references Annex B; for reference, the B.2.8.1 additional associated guidance is repeated below, as well as the parallel text from Clause 10 of ANSI C63.4-2014. For rationale, ASC C63® with IEEE as Secretariat generally follows the IEEE-SA Standards Style Manual; the latter cites the Merriam-Webster dictionary for terms not defined in the IEEE standards dictionary. (http://www.merriam-webster.com/dictionary/plot) plot: a graphic representation (as a chart)

Standard	Clause/ Sub clause	Paragraph Figure/ Table	Type (General/ Technical/ Editorial)	Comment / Inquiry	Subcommittee Response (to be filled in by Subcommittee Chair)
C63.10:2013	6.3.4			We have attached 3 examples and would like to know which are acceptable for satisfying the term plot (see next page)	All examples are considered to be plots, but the plot of only the six highest readings may not provide sufficient data to show a trend, and regulatory or purchasing authorities might take exception to that type of plot.

The following is only supporting information and discussion topics used to derive the above interpretation and is not considered part of the formal interpretation. The information is provided solely to assist SC1 members in understanding the reasoning and final input in the interpretation of 'plot' as used in the standard in question.

ANSI C63.10; 6.3.4 Test report
For radiated emission test data reporting, both plots and tabular data shall be included.
When multiple operating modes are evaluated, only the worst-case plots for each mode in each operating band need to be included in the report.
A diagram or photograph of the test setup that was used shall also be included.
Data content and format shall conform to the requirements specified in Clause 15.

ANSI C63.10; 15. Test reports
...
The test report shall contain at a minimum the following items:
...
5) The results of the test in the form of tables, spectrum analyzer plots, charts, sample calculations, and so on, as appropriate for each test procedure.
...
An example of a test report layout is shown in Annex B. ...

ANSI C63.10; B.2.8.1 General requirements
The measurement results, along with the appropriate limits for comparison, should be presented in tabular or graphical form.
Alternatively, recorded charts, photographs of a spectrum analyzer display, or printouts of receiver screen contents may be used if the information is presented clearly showing a comparison with the limits, and all data conversions are explained. ...

ANSI C63.4-2014; 10.2.8.1 General requirements
The measurement results, along with the appropriate limits for comparison, shall be presented in tabular or graphical form.
Alternatively, recorded charts, photographs of a spectrum analyzer display, or printouts of receiver screen contents may be used if the information is clearly presented showing comparison to the limits and all data conversions are explained. ...

MISCELLANEOUS BACKGROUND REMARKS – FOR INFO/RECORD ONLY, NOT PART OF THE INTERPRETATION REQUEST RESPONSE

To properly address the question and because several terms are sometimes used interchangeably, a comparison between several terms commonly used should be done. These terms are: Plot, Chart, Graph, Curve and graphical representation.

Graphical representation = the visual display of a set of data using plots, charts and graphs.

Chart = a graphical representation of data, in which the data is represented by symbols such as bars, lines or pie sections.

Graph = a graphical representation using a collection of points expressing a mathematical or possibly statistical function. The points of a graph are commonly called vertices, nodes or points.

Curves = a line or outline that gradually deviates from being a straight line for some or all of its length.
IEV definition of curve in linear algebra is "set of points of a point space or of a plane, the position vector of which is a continuous function r=f(u), where the parameter u is a real number in a given interval. (NOTE A plane curve can also be defined algebraically by the equation f(x,y)=0.

Plot = generally accepted definition is a graphical representation of a series of data or coordinate points. While the IEEE standards dictionary does not define 'plot' it does define 'plotter as "An output unit that presents data in the form of a two-dimensional graphic representation." From this it can be expected that the term plot would be 'data in the form of two-dimensional graphic representation'. This is consistent with the generally accepted definition as stated above.

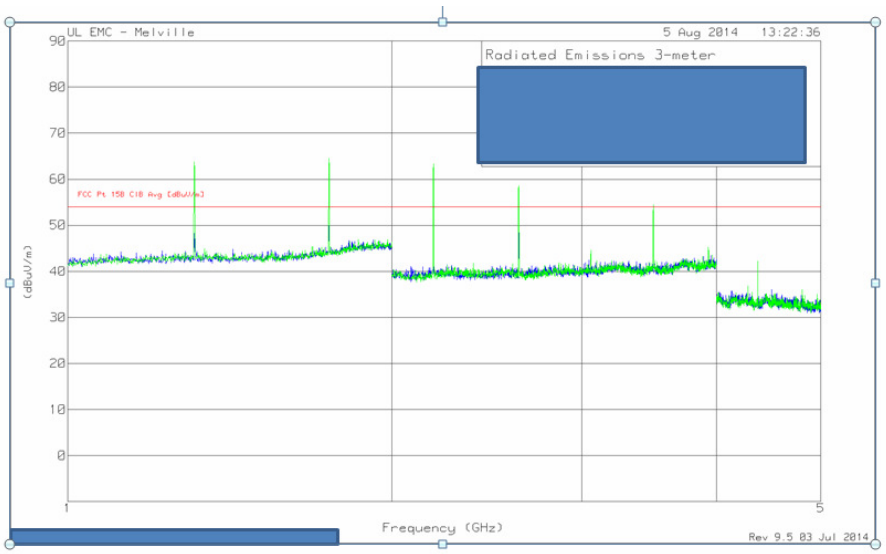
While sometimes used interchangeably, the difference between a graph and a plot is that a plot may not be a complete representation of a function while a graph may be the complete representation of a function. While a plot can be made of specific finite points from the graph of a function, it is not a representation of that function. In other words, a plot is used to represent a specific finite set of points or data, while a graph is used to represent a function having an infinite set of points.

Also, since a chart is also the graphical representation of data, if the chart is a line chart, it could also be considered a plot. Plots and charts may contain curves due to the non-linearity of the data plotted.

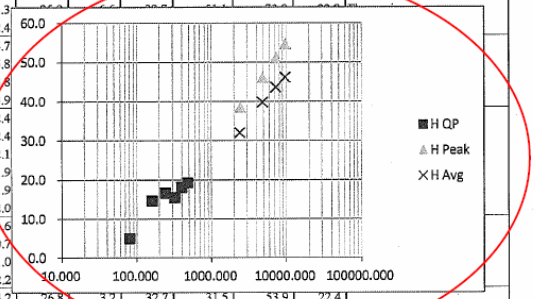
Graphical representations such as plots, charts and graphs are used to visualize a set of points or functions so as to quickly analyze these data and functions to reveal trends of those data or functions.

With the above in mind, for the text of the standard, the term plot means a graphical representation of a series of data sufficient to show the trend of emissions characteristics of the device being tested.

NOTE: It is important to understand that, while no maximum number of points is stated as being required, the minimum number stated as required for the tabular data may not be sufficient in order to show the trend of the emissions characteristics of the measurement. Consequently, again while no specific amount of data points is given, and since the six highest tabular data are derived from a significantly larger set of data, the graphical representation should generally contain more data points than provided in the six highest listed in a table.



Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	80.000	QP	22.4	6.8	7.8	32.1	4.9	40.0	35.1	
Hori	160.000	QP	22.4	15.5	8.7	32.1	14.5	43.5	29.0	
Hori	240.000	QP	22.1	17.0	9.4	32.0	16.5	46.0	29.5	
Hori	320.000	QP	21.9	15.3	10.1	31.9	15.4	46.0	30.6	
Hori	400.000	QP	21.9	17.6	10.5	32.0	18.0	46.0	28.0	
Hori	480.000	QP	22.0	18.1	11.0	32.0	19.1	46.0	26.9	
Hori	2390.000	PK	41.2	26.8	3.2	32.7	38.5	73.9	35.4	
Hori	4810.000	PK	42.1	30.6	5.2	31.8	46.1	73.9	27.8	
Hori	7215.000	PK	41.3							
Hori	9620.000	PK	42.4							
Hori	2390.000	AV	34.7							
Hori	4810.000	AV	35.8							
Hori	7215.000	AV	33.8							
Hori	9620.000	AV	33.9							
Vert	80.000	QP	22.4							
Vert	160.000	QP	22.4							
Vert	240.000	QP	22.1							
Vert	320.000	QP	21.9							
Vert	400.000	QP	21.9							
Vert	480.000	QP	22.0							
Vert	2390.000	PK	41.6							
Vert	4810.000	PK	40.7							
Vert	7215.000	PK	41.0							
Vert	9620.000	PK	42.2							
Vert	2390.000	AV	34.2	26.8	3.2	32.7	31.5	53.9	22.4	
Vert	4810.000	AV	34.2	30.6	5.2	31.8	38.2	53.9	15.7	
Vert	7215.000	AV	33.8	35.9	6.6	32.7	43.6	53.9	10.3	Floor noise
Vert	9620.000	AV	33.9	38.5	7.0	33.3	46.1	53.9	7.8	Floor noise



Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).