3M Technical Brief: Current Ratings of Common 3M™ Flat Ribbon Cables

Product Specification 78-5102-0181-3

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1.0 Scope

This paper presents the results of current rating testing for a variety of 3M Round Conductor Flat Cables. The variety of products is discussed below and the testing environment is defined. Next, the method for collecting temperature data is discussed and finally the data is addressed. The purpose of this paper is to give guidance for maximum current limits for popular 3M cable products. The final current levels must be determined by the system designer, taking into account the heat generated and configuration of their system.

2.0 Cable Information

The test specimens were all 20-position cables that measured 12" in length. These cables were chosen based on their uses in primary connector product lines. The three cables represented have qualities shown in Table 2.1, below.

2.1 Cable Information Table

3M Part No.	Conductor	Conductor Spacing	Insulation	Maximum Recommended Current 30^{0}C T-Rise Derated
3754/20	30 AWG	0.025"	PVC	1.00 A
3625/20	28 AWG	1.0 mm	PVC	1.50 A
3365/20	28 AWG	0.050"	PVC	1.75 A

3.0 Environment and Test Method

All testing for current rating is carried out in a constant temperature and humidity laboratory. Each part number has three samples prepared for testing and are placed horizontally, air-suspended in an acrylic case. The acrylic case has a partially-opened top to allow convectional airflow through the testing area. Once the samples are placed and wired in series, thermocouples are placed at key hot spots on each sample to measure the rise above ambient temperature achieved.

4.0 Temperature Rise

In order to measure the temperature rise of a product, the specimen temperature must be measured in regard to the ambient temperature of the testing environment. The corresponding current value is then typically derated 20% and the point at which a 30^{0}C difference is detected is the maximum recommended current. In addition, a maximum 85^{0}C ambient temperature is recommended.

5.0 Application

The data provided is for guidance only. Additional items to consider in individual applications are the number of conductors powered, their relative location to each other, air flow, elevation while in use, and adjoining insulation or heat generating cables or devices. Contact 3M for more specific guidance.

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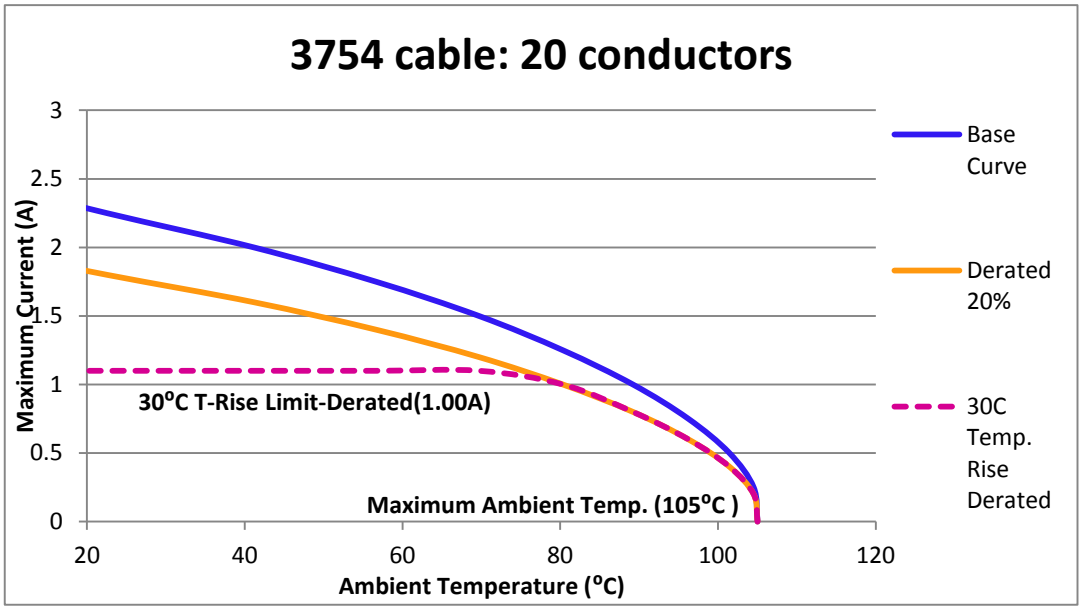
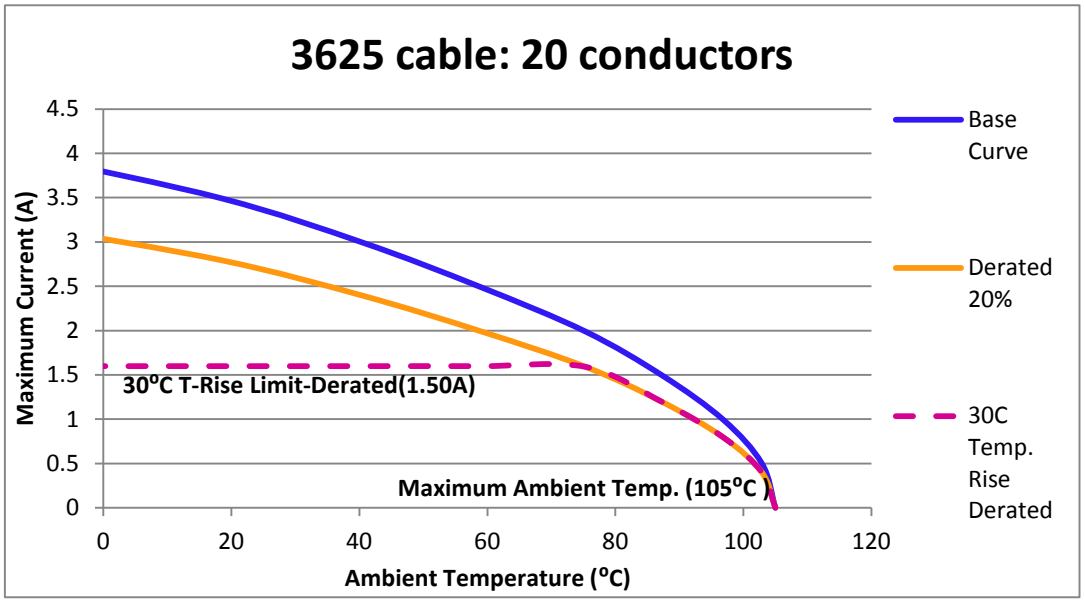
6.0 Figures

6.1 Current Rating





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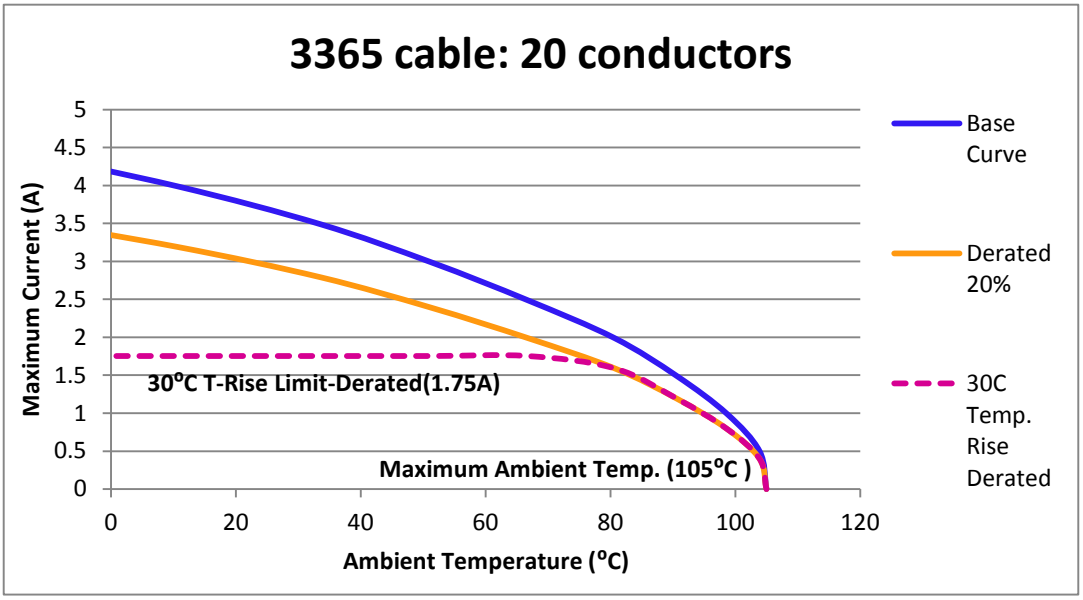

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