Texas Instruments Enhanced Plastic (EP) products provide a means to facilitate, not replace, OEM qualification of COTS devices through baseline control and enhanced qualification pedigree. TI EP package qualification comprehends performance at extended temperatures with package element concerns such as glass transition temperature and thermal expansion coefficients taken into account. Electrical testing is warranted to meet the data sheet over the specified temperature range.

EP devices are qualified in accordance with TI Quality System Standards. Reliability monitors are performed on a regular basis and include EFR/IFR (life test), temperature cycle, and Biased Humidity (or HAST). TI Quality System Standards are based upon accepted JEDEC and EIA standards for the test methods used.

In specific cases, when noted on the TI Enhanced Plastic Data sheet, long term high-temperature storage and/or extended use at maximum recommended operating temperatures may result in a reduction of overall device life. The following information is provided as a guide for those specific cases. Please see the attached Enhanced Plastic disclaimer for more information.

Enhanced Plastic Quality and Reliability Data Disclaimer

The quality and reliability information provided by Texas Instruments is specific to the TI Enhanced Plastic product family of plastic encapsulated commercial-off-the-shelf (COTS) semiconductor products and components. Due to possible differences in product assembly and test baselines, this information is NOT APPLICABLE to TI standard, industrial, or automotive catalog commercial products.

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Quality and reliability data provided by Texas Instruments is intended to be an estimate of product performance based upon history only. It does not imply that any performance levels reflected in such data can be met if the product is operated outside the conditions expressly stated in the latest published data sheet for a device.

Existing industry standards for plastic encapsulated microcircuit qualification and reliability monitors are based upon historical data, experiments, and field experience with the use of these devices in commercial and industrial applications. The applicability of these standards in determining the suitability for use and safety performance in military and aerospace applications has not been established. Due to the multiple variations in field operating conditions, a component manufacturer can only base estimates of product life on models and the results of package and die level qualification.

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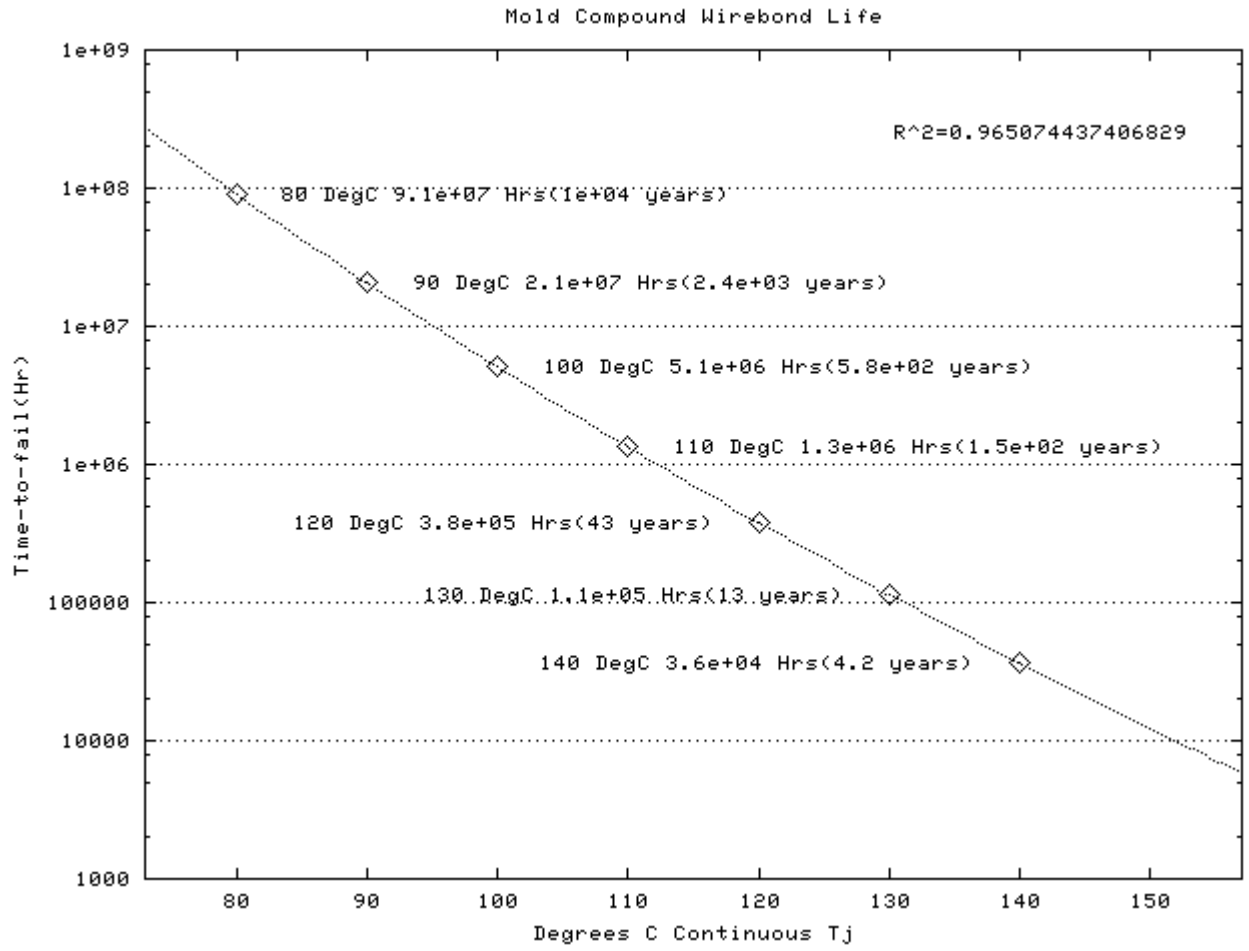
Wirebond Life Estimator

Elevated Temperature Kirkendall Voiding Fail Mode

only valid for die pads with Al surface - N/A if pads have other types of surface metal (BOAC, Cu etc.)

1. Select Mold Compound	2. Junction Temp	OR	2. Ambient, Tja and Power
GE1030MDP	136 Tj(C)		Ta(C) Tja(C/W) Power(W)
Standard Plot	Std Min Temp Std Max Temp		Alternate Title
Calculate	**Estimated Wirebond Life is 57123 hours(6.5 Years)**		

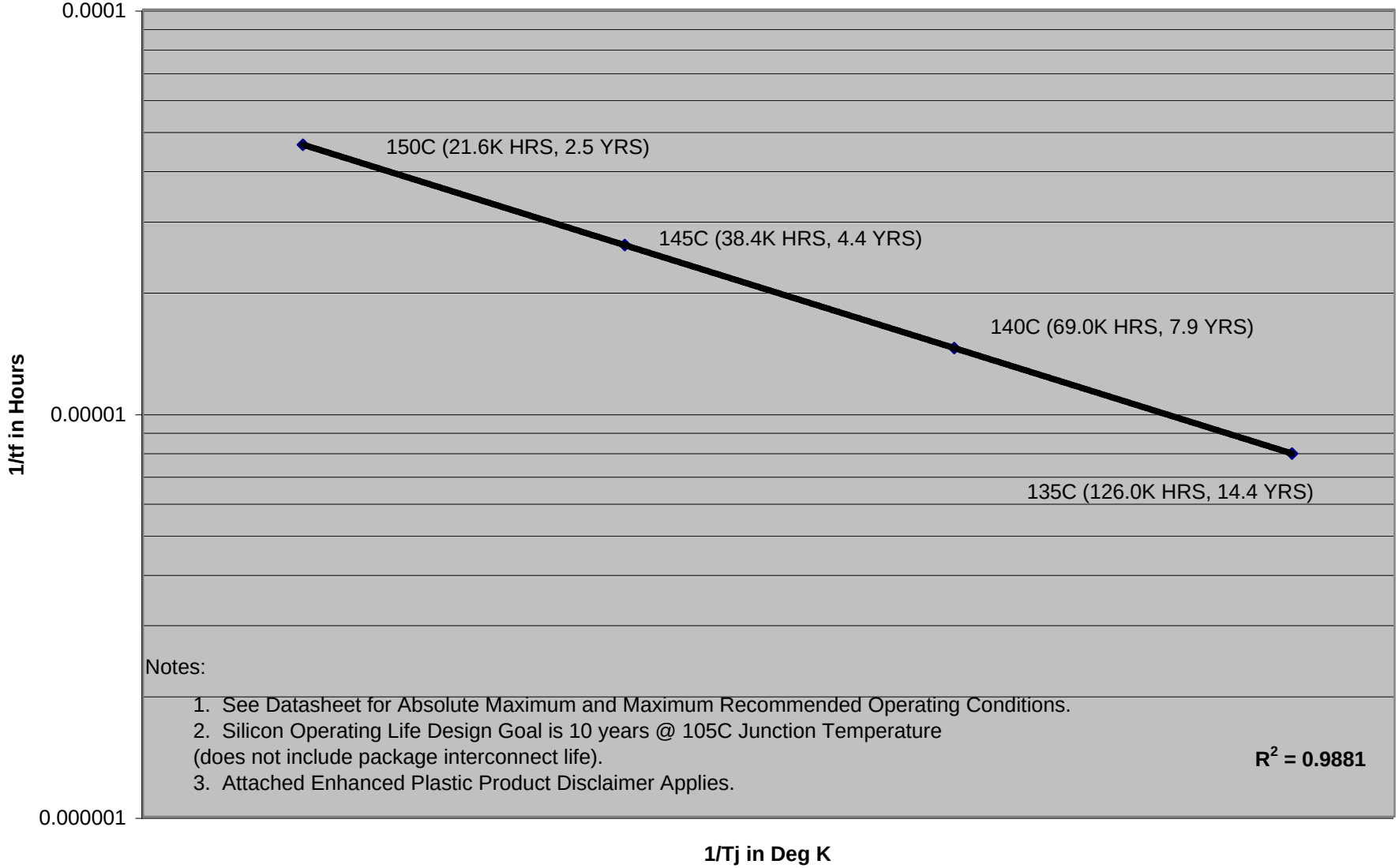


Reference Assessing Encapsulant Impact on Ball Bond Life

Any questions or comments regarding this area should go to :

Andy Pauley 903-868-6379

OPERATING LIFE DERATING TABLE - LM2901QPWREP
1/TF versus 1/Tj in ºK

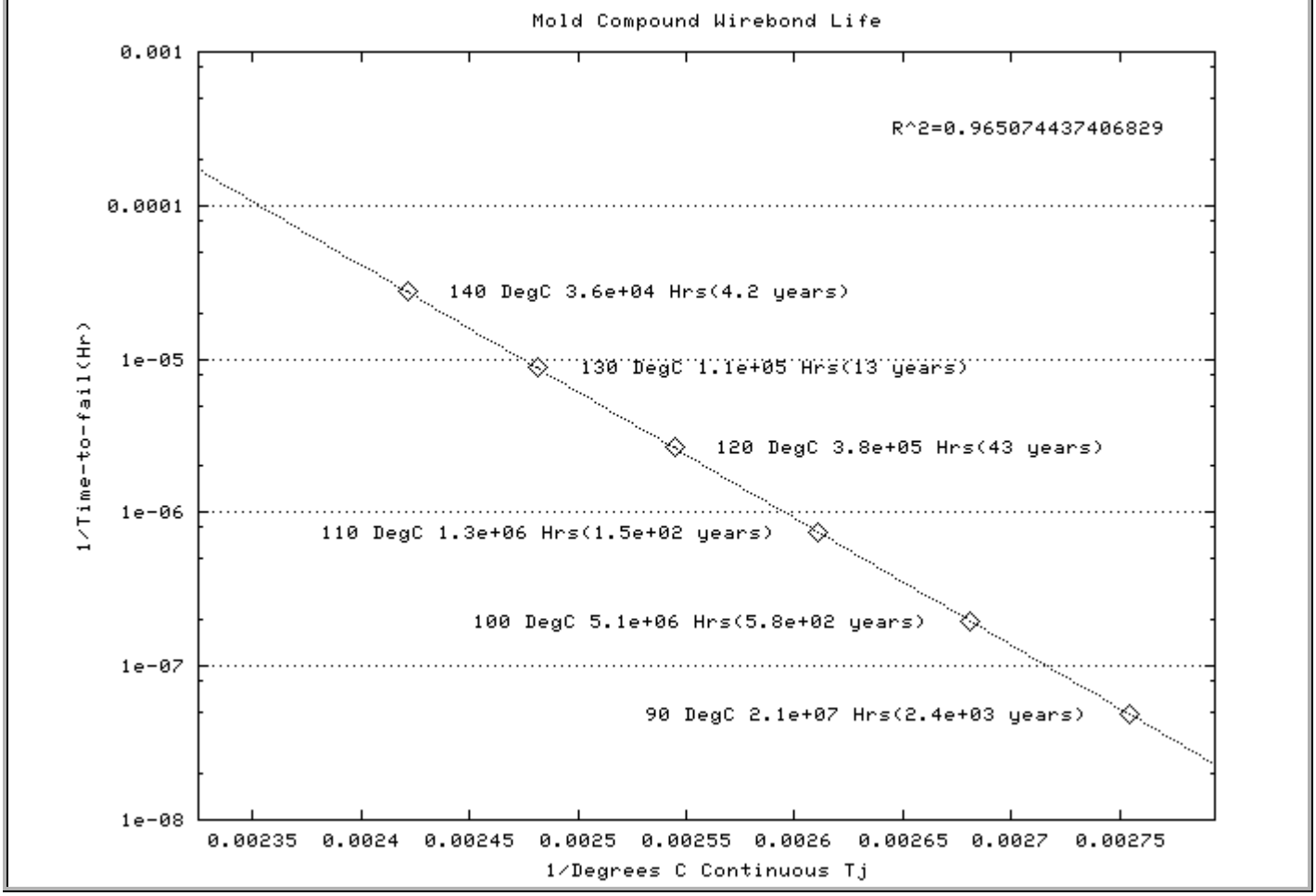


Wirebond Life Estimator

Elevated Temperature Kirkendall Voiding Fail Mode

only valid for die pads with Al surface - N/A if pads have other types of surface metal (BOAC, Cu etc.)

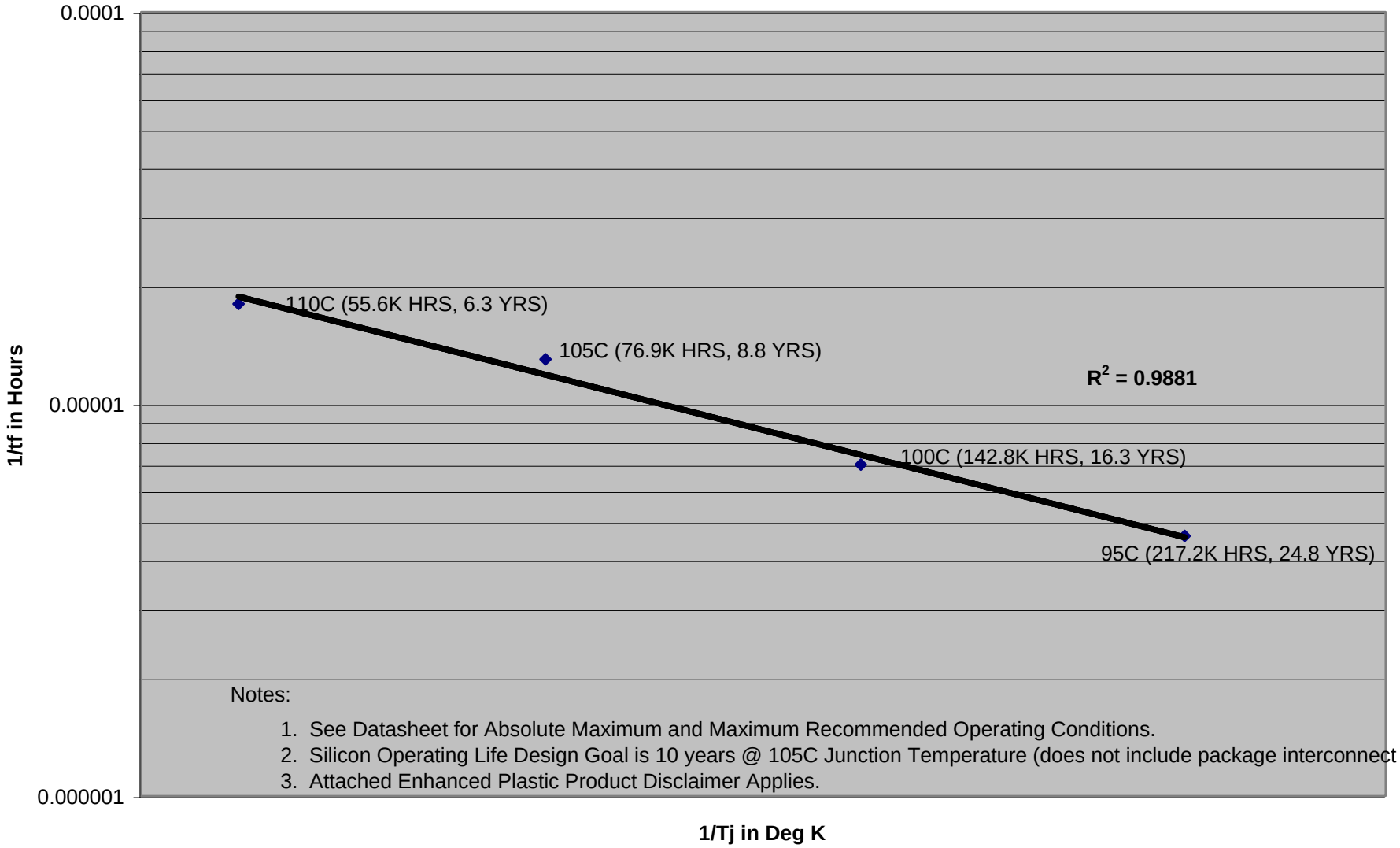
1. Select Mold Compound	2. Junction Temp	OR	2. Ambient, Tja and Power
GE1030MDP	142 Tj(C)		Ta(C) Tja(C/W) Power(W)
Official Plot	Std Min Temp Std Max Temp		Alternate Title
Calculate	**Estimated Wirebond Life is 29181 hours(3.3 Years)**		



Reference Assessing Encapsulant Impact on Ball Bond Life

Any questions or comments regarding this area should go to :
Andy Pauley 903-868-6379

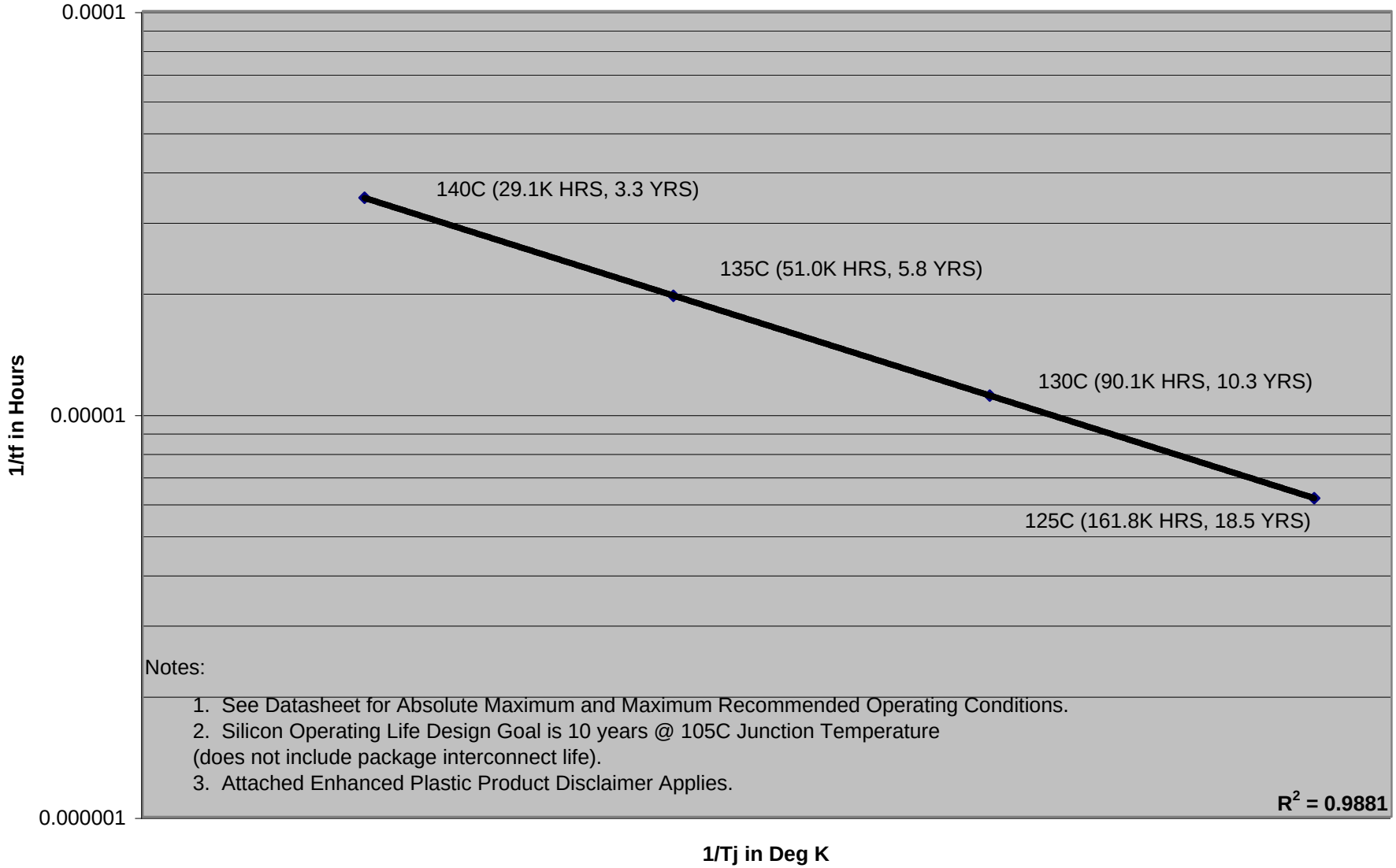
OPERATING LIFE DERATING TABLE - SM320VC33PGEA120EP
1/TF versus 1/Tj in ºK



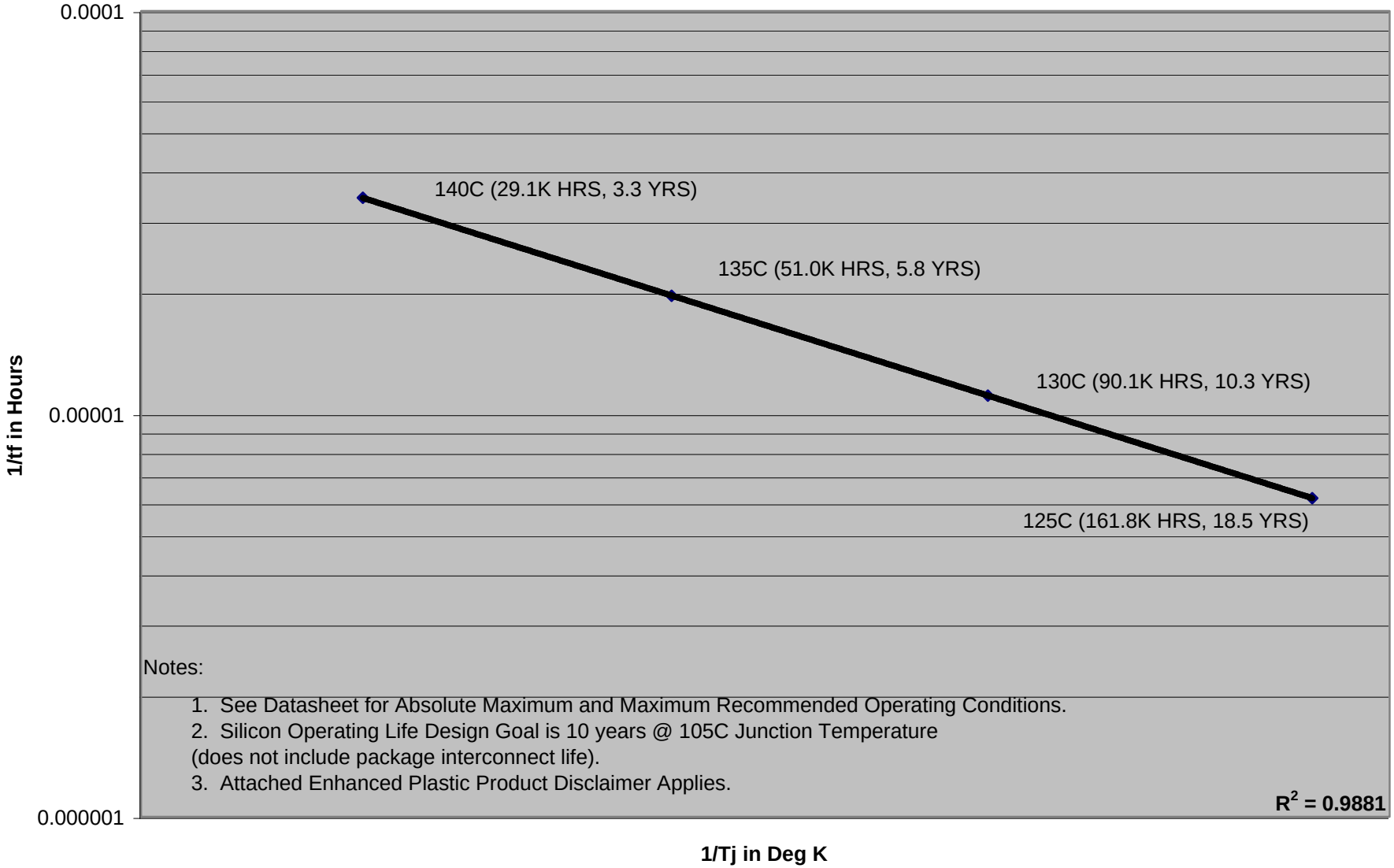
Notes:

1. See Datasheet for Absolute Maximum and Maximum Recommended Operating Conditions.
2. Silicon Operating Life Design Goal is 10 years @ 105C Junction Temperature (does not include package interconnect
3. Attached Enhanced Plastic Product Disclaimer Applies.

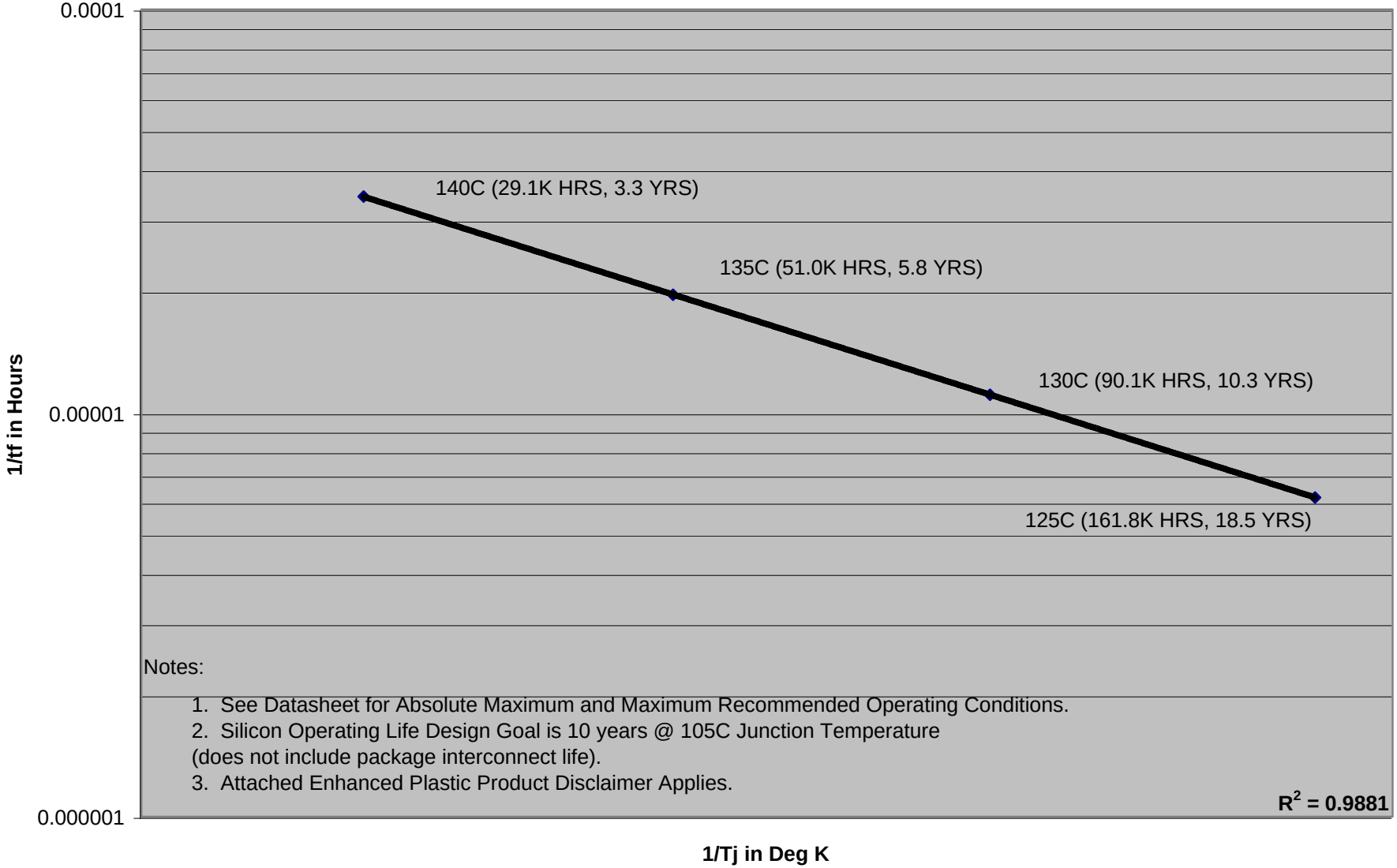
OPERATING LIFE DERATING TABLE - SN65LBC176QDREP
1/TF versus 1/Tj in ºK



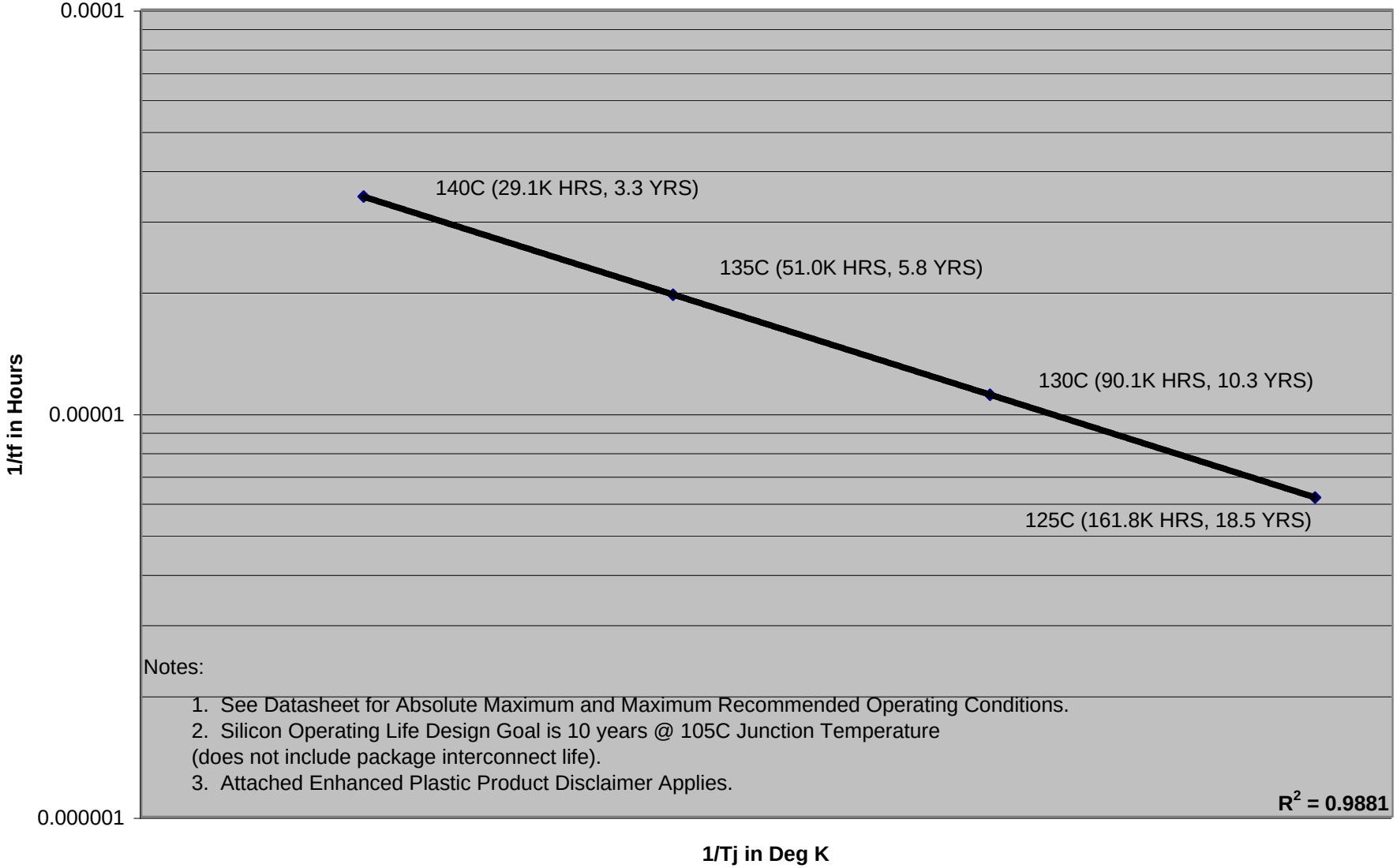
OPERATING LIFE DERATING TABLE - SN74AC04MDREP
1/TF versus 1/Tj in ºK



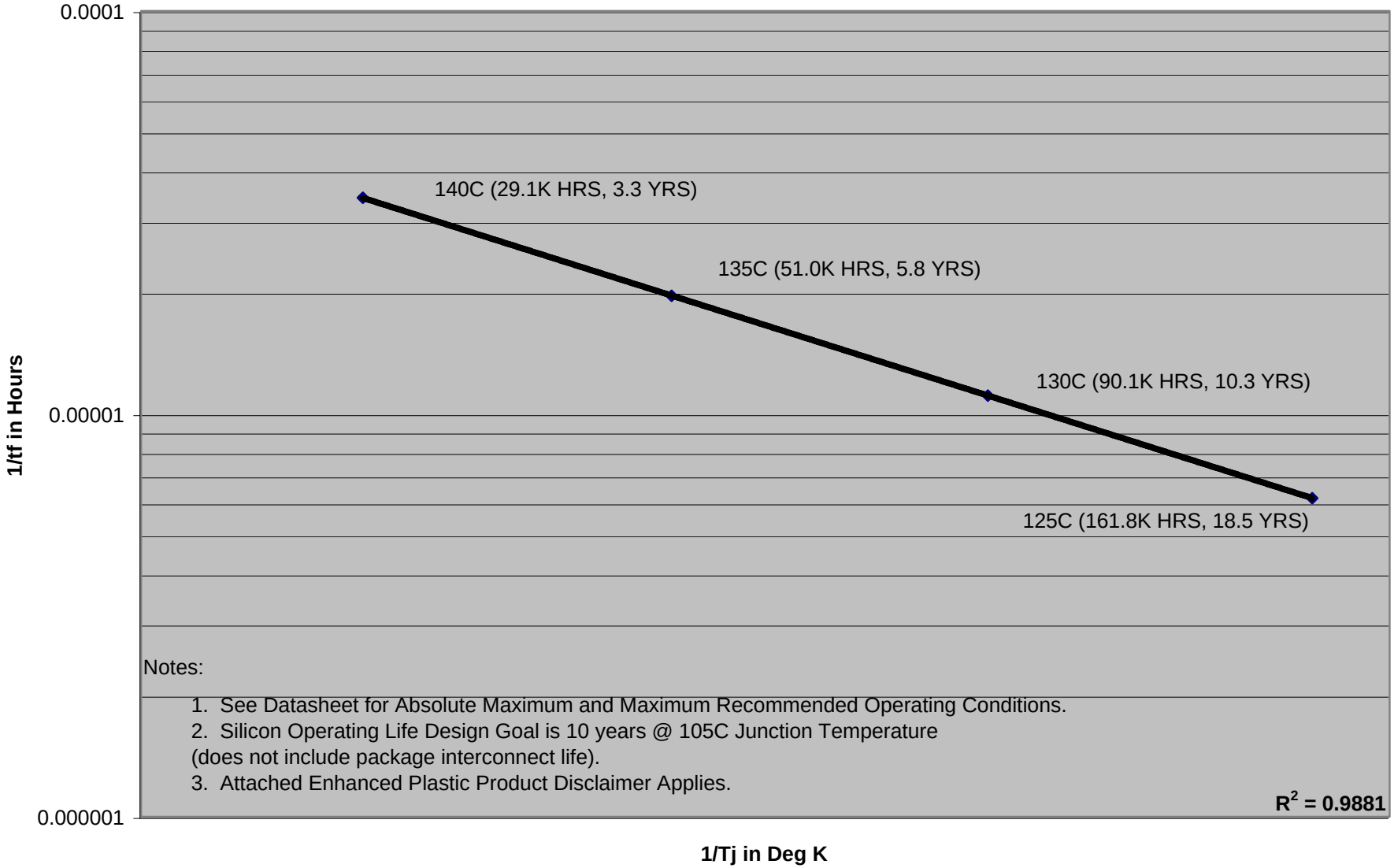
OPERATING LIFE DERATING TABLE - SN74AC14MDREP
1/TF versus 1/Tj in ºK



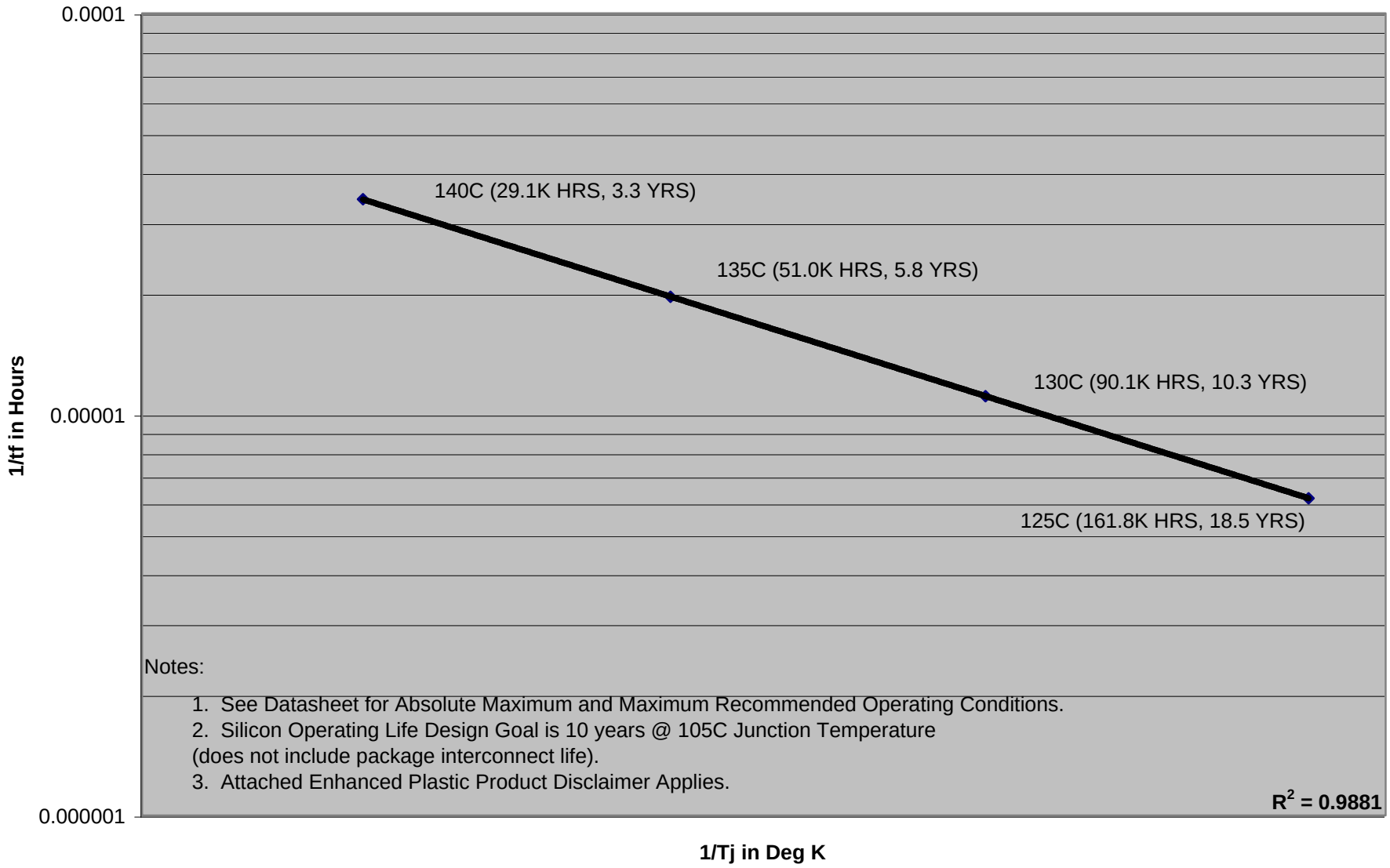
OPERATING LIFE DERATING TABLE - SN74AC244MDREP
1/TF versus 1/Tj in ºK



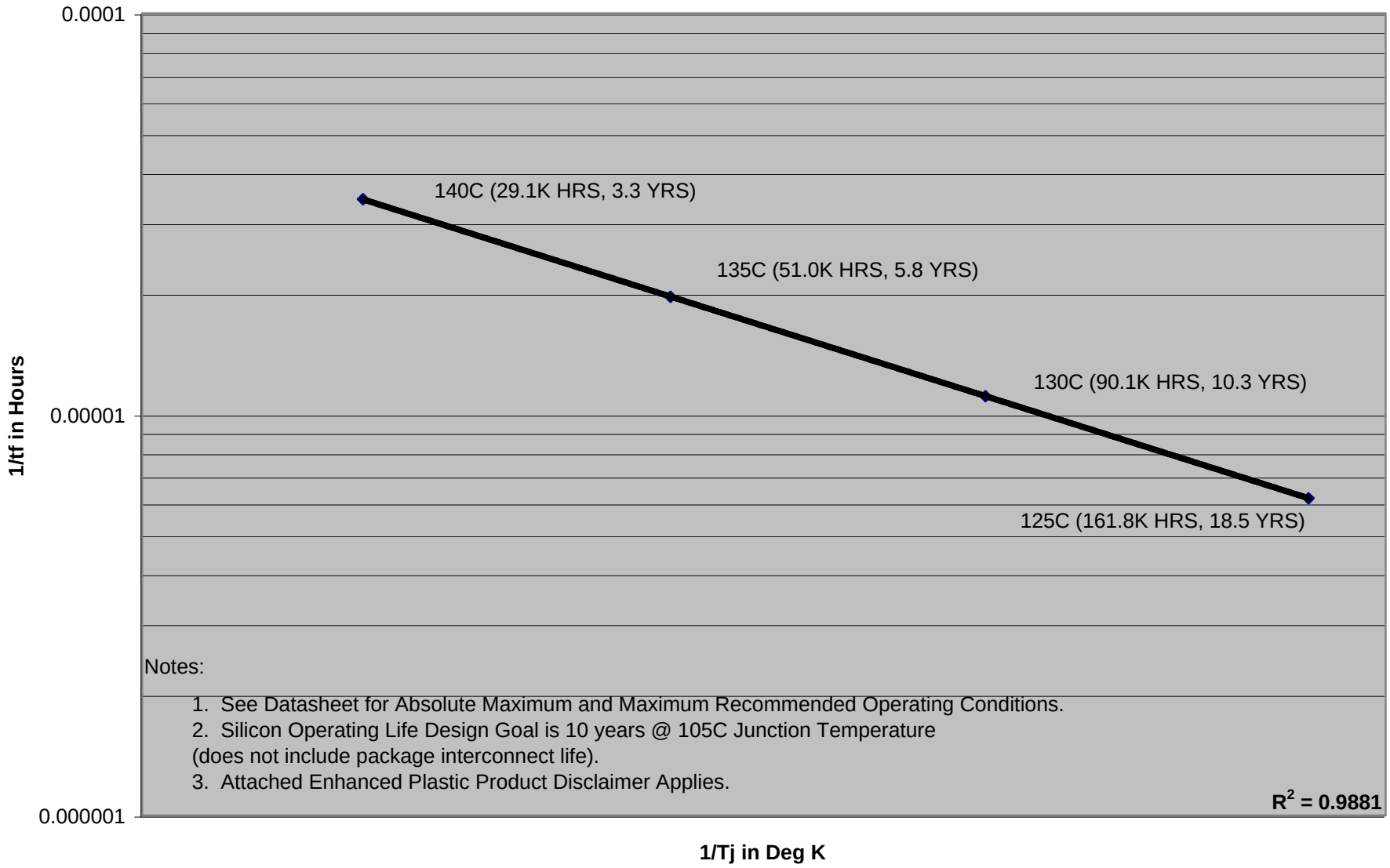
OPERATING LIFE DERATING TABLE - SN74AC373MDWREP
1/TF versus 1/Tj in ºK



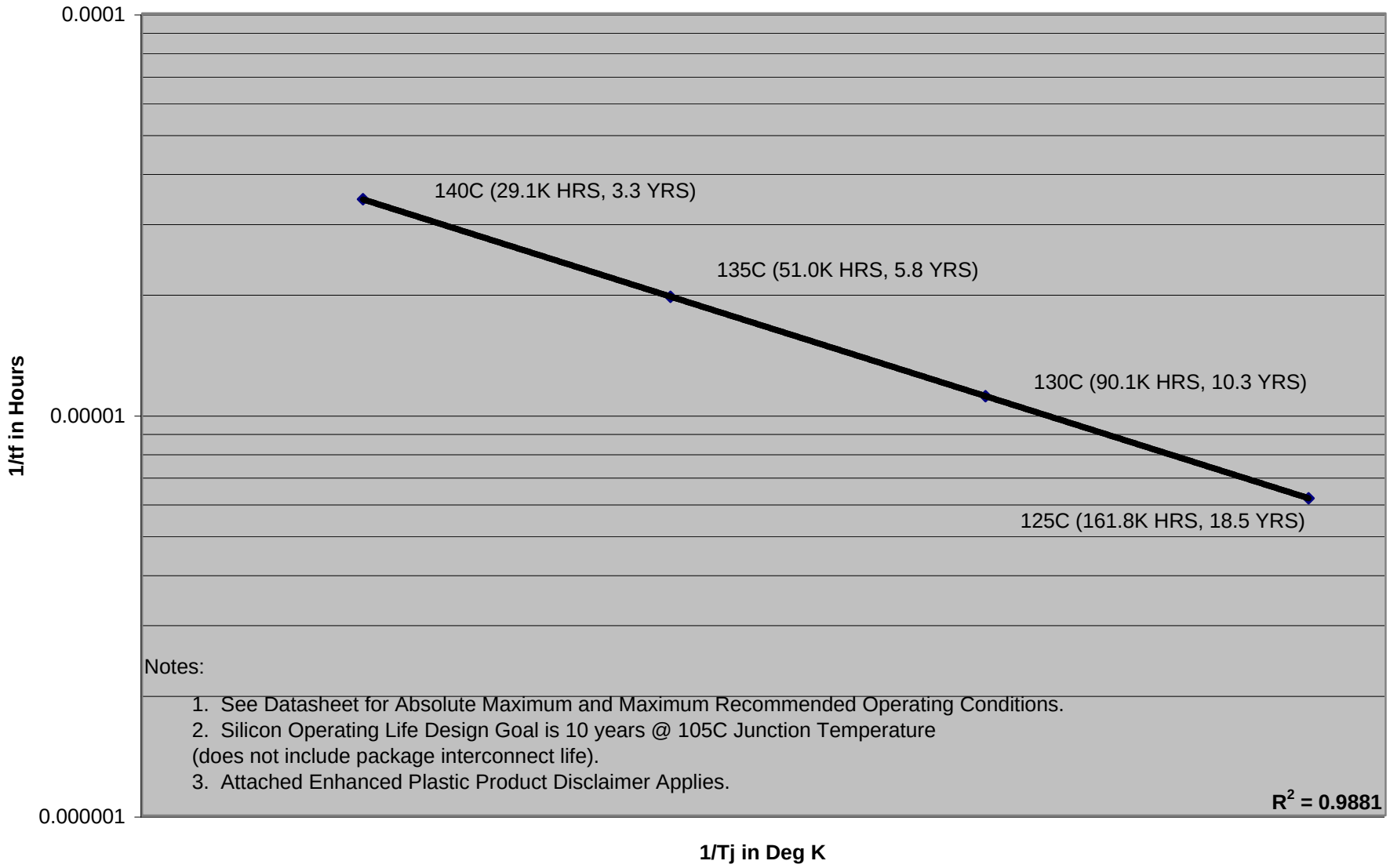
OPERATING LIFE DERATING TABLE - SN74ACT244MDWREP
1/TF versus 1/Tj in ºK



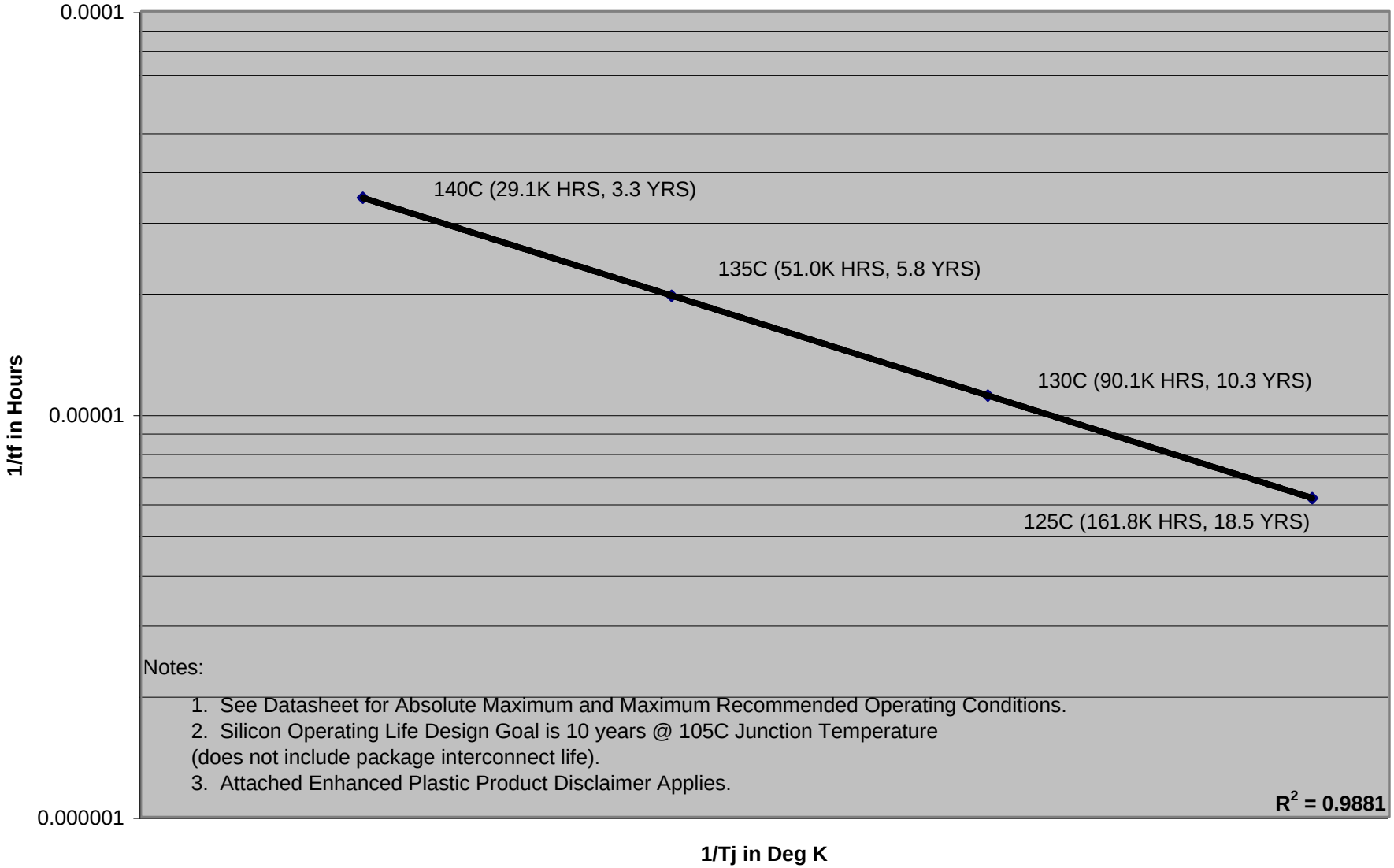
OPERATING LIFE DERATING TABLE - SN74ACT373MDWREP
1/TF versus 1/Tj in ºK



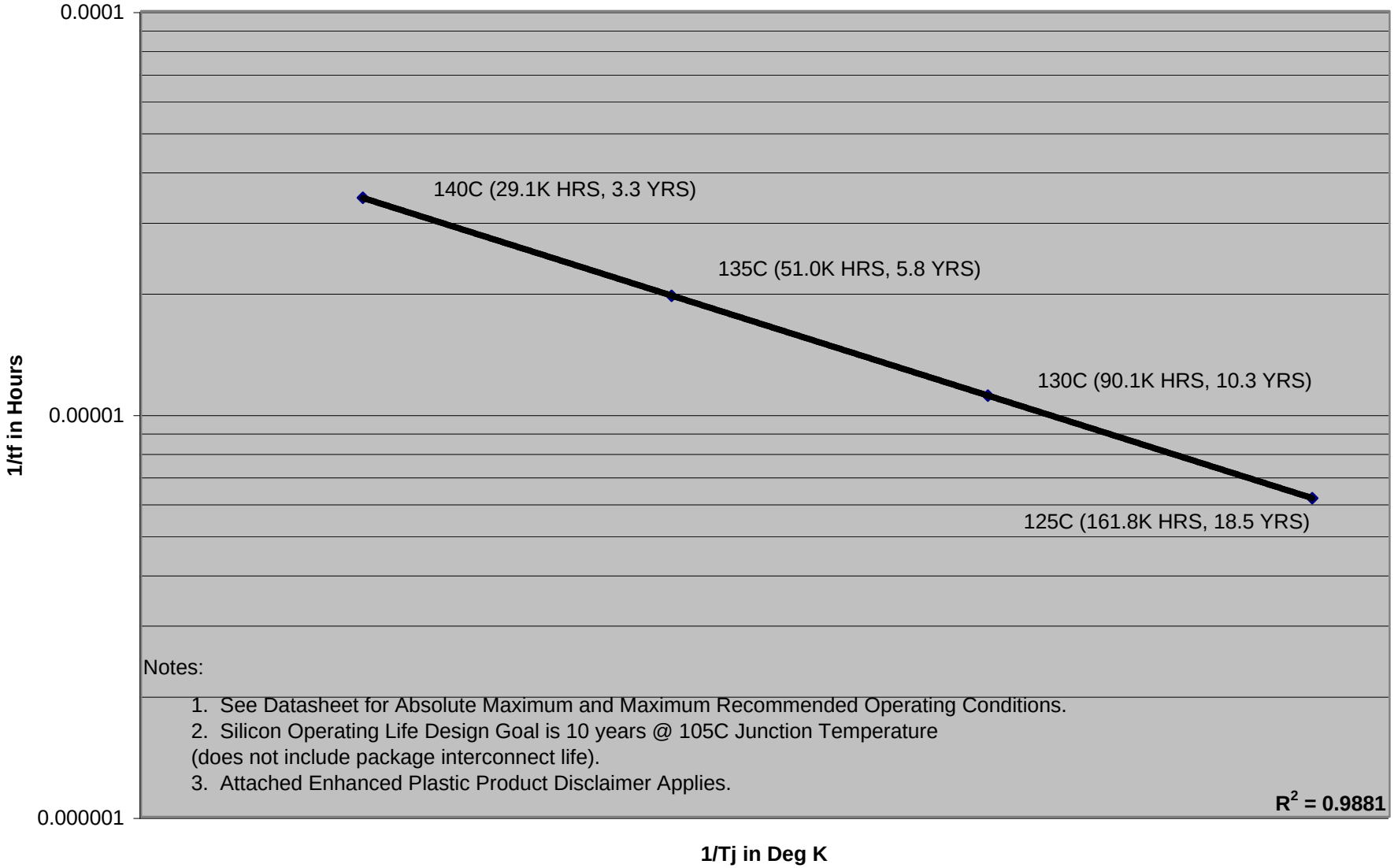
OPERATING LIFE DERATING TABLE - SN74ACT74MDREP
1/TF versus 1/Tj in ºK



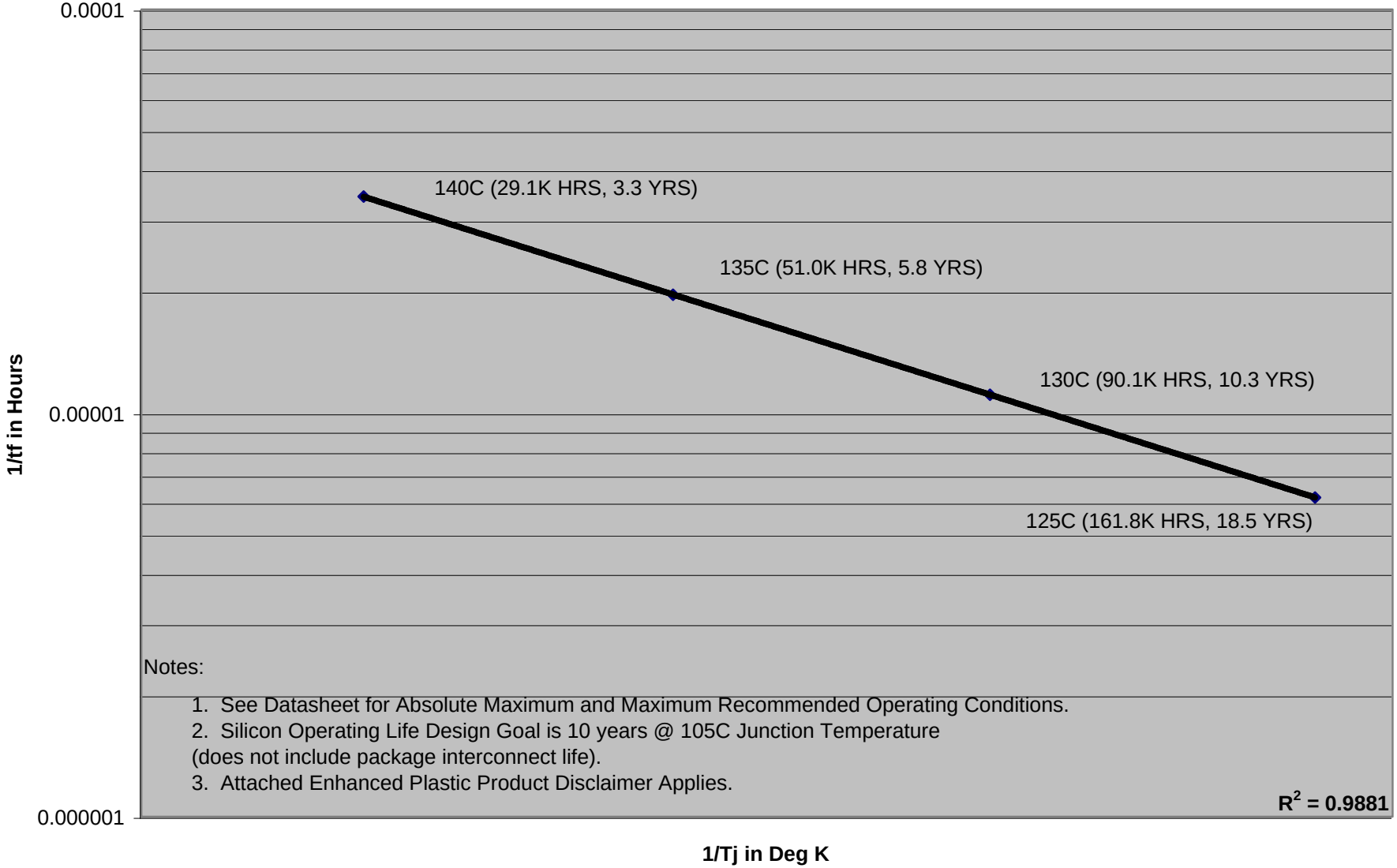
OPERATING LIFE DERATING TABLE - SN74LVC04AQDREP
1/TF versus 1/Tj in ºK



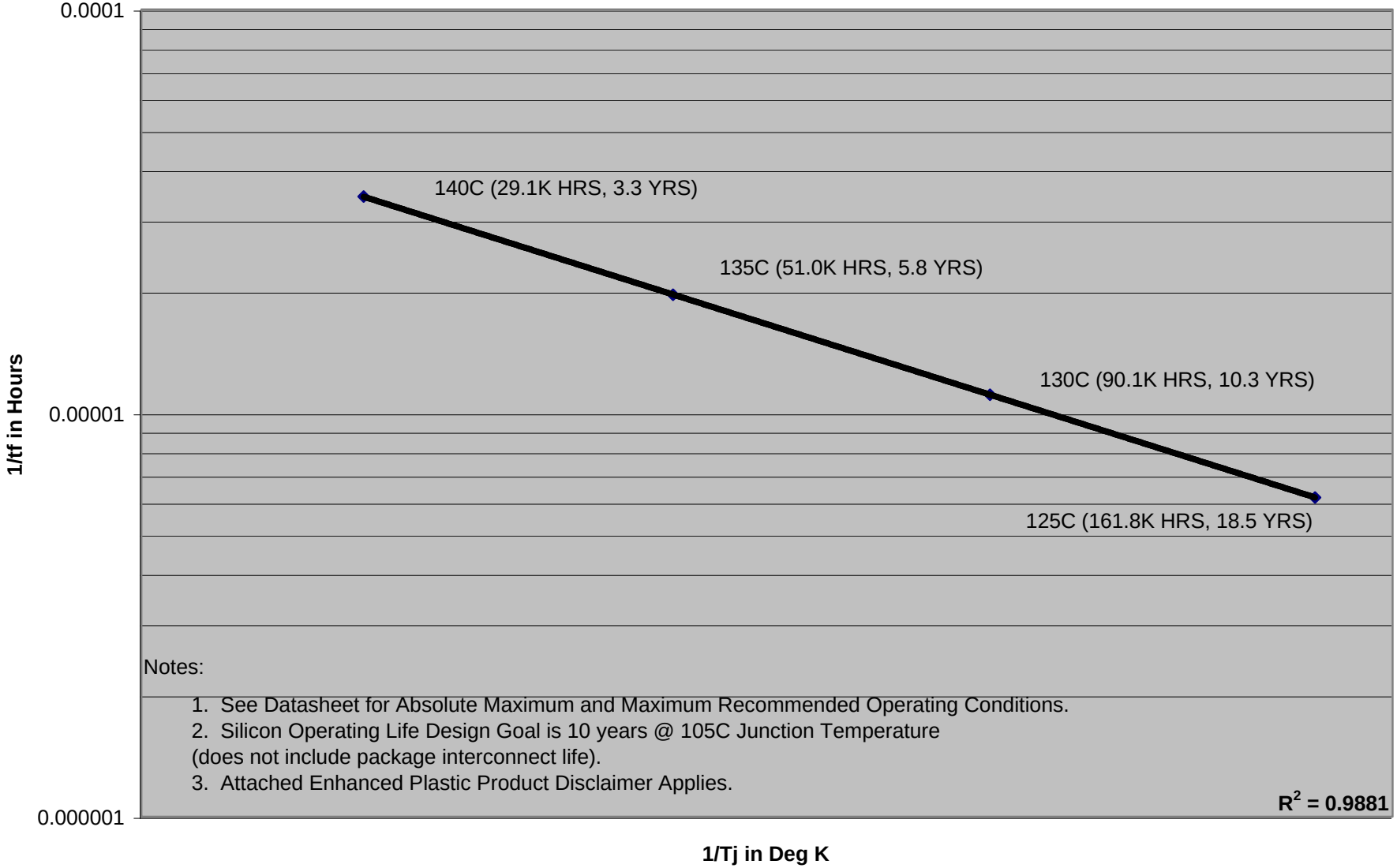
OPERATING LIFE DERATING TABLE - SN74LVC138AQDREP
1/TF versus 1/Tj in ºK



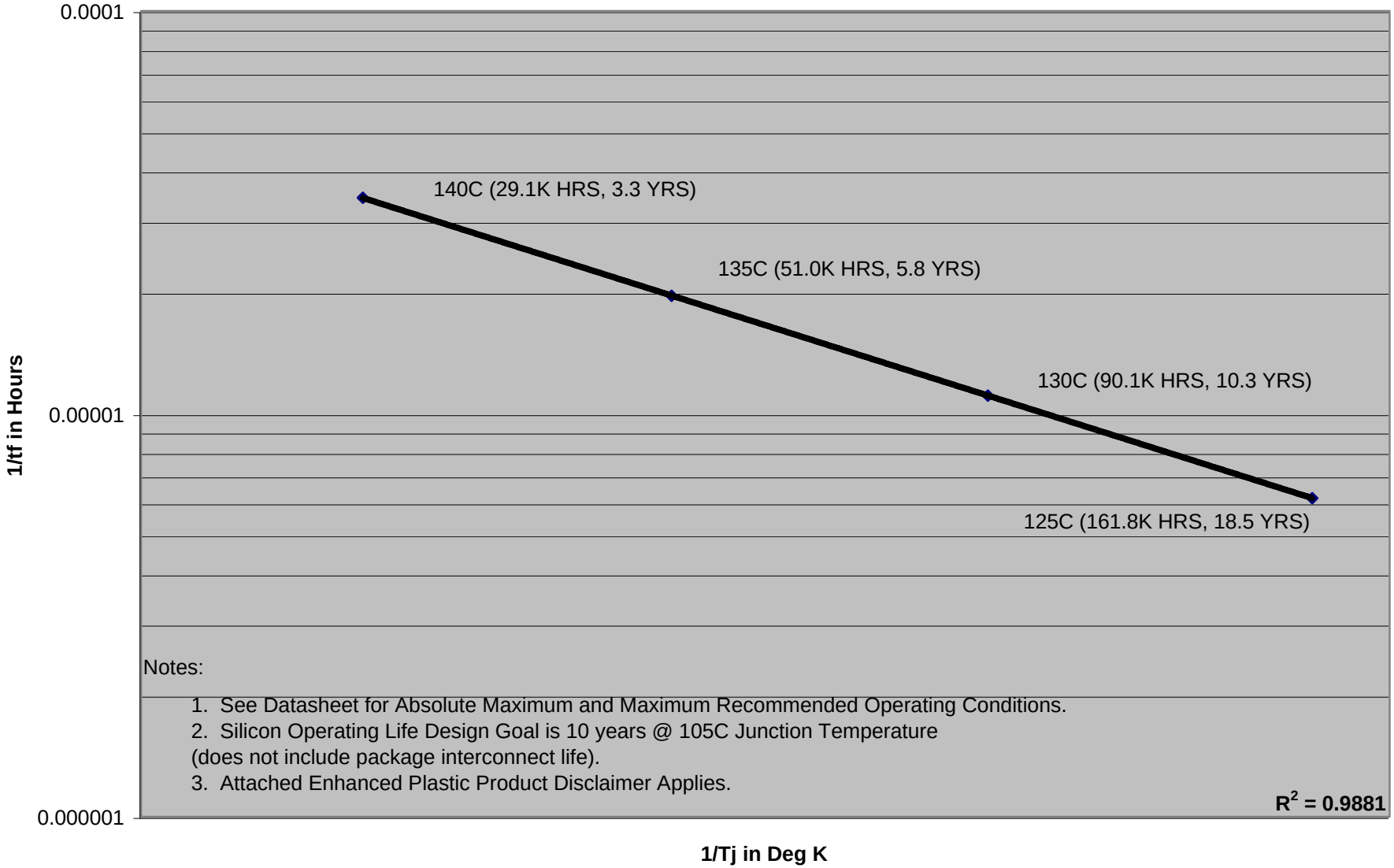
OPERATING LIFE DERATING TABLE - SN74LVC373AQDWREP
1/TF versus 1/Tj in ºK



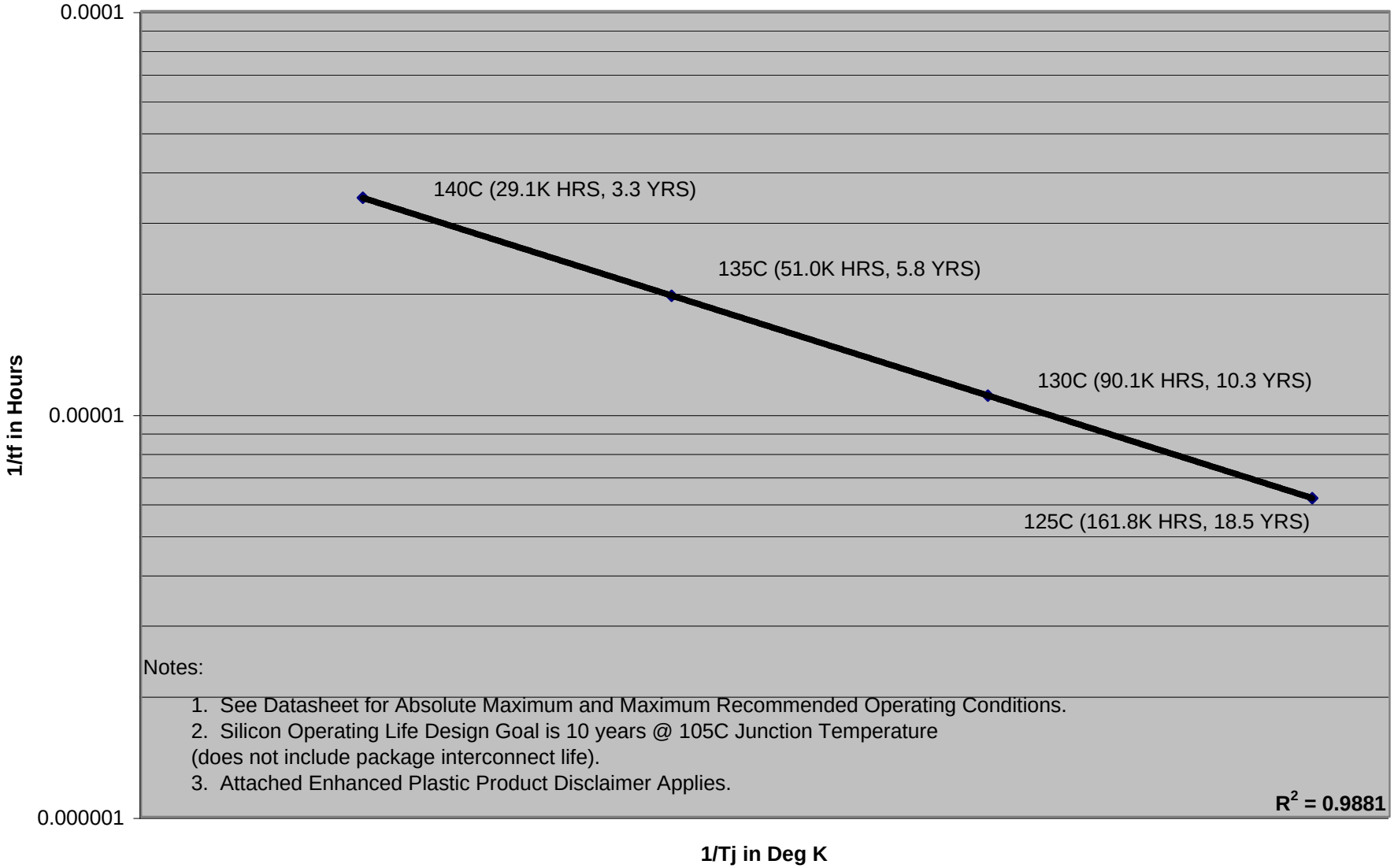
OPERATING LIFE DERATING TABLE - SN74LVC374AQDWREP
1/TF versus 1/Tj in ºK



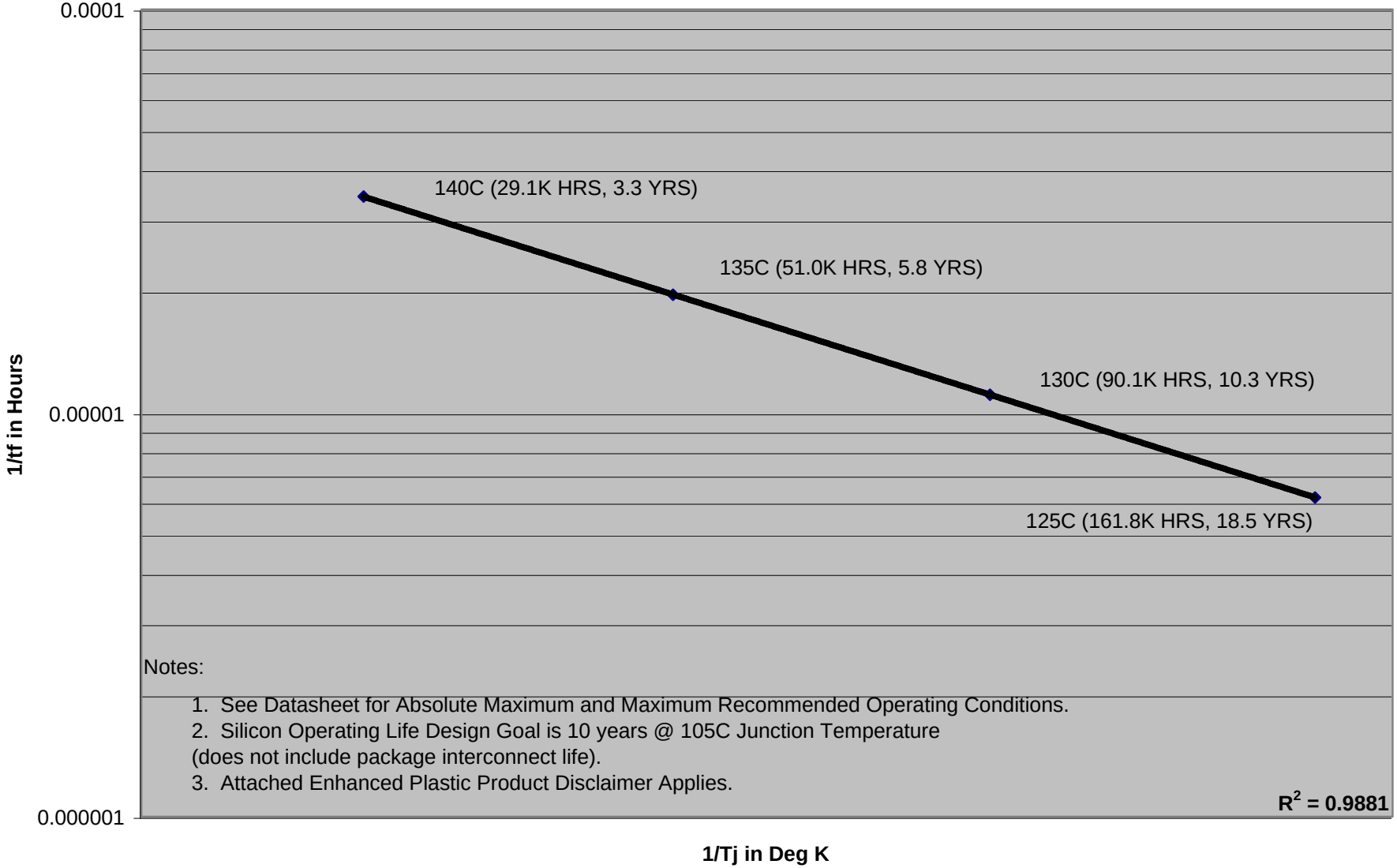
OPERATING LIFE DERATING TABLE - SN74LVC540AQDWREP
1/TF versus 1/Tj in ºK



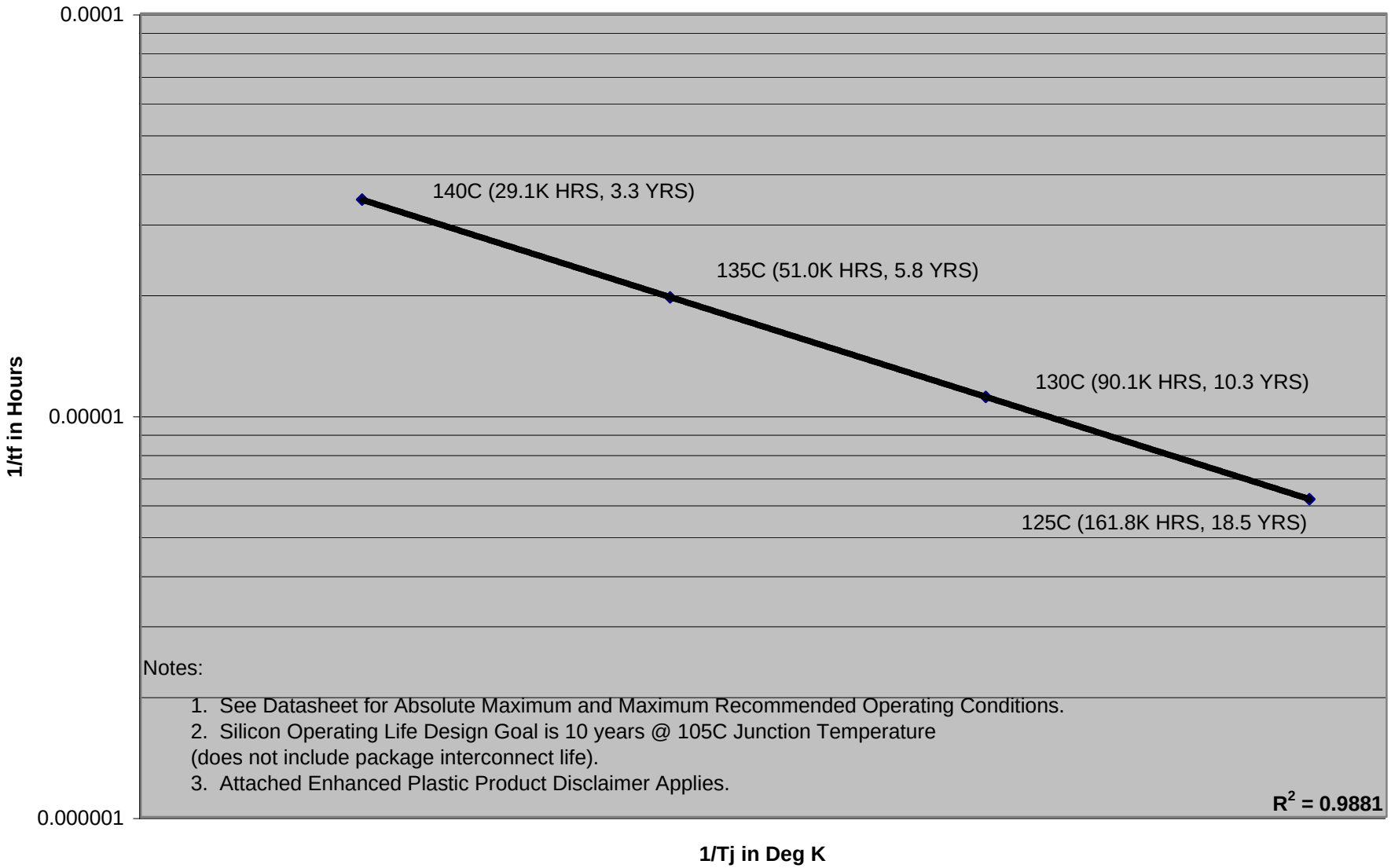
OPERATING LIFE DERATING TABLE - SN74LVC541AQDWREP
1/TF versus 1/Tj in ºK



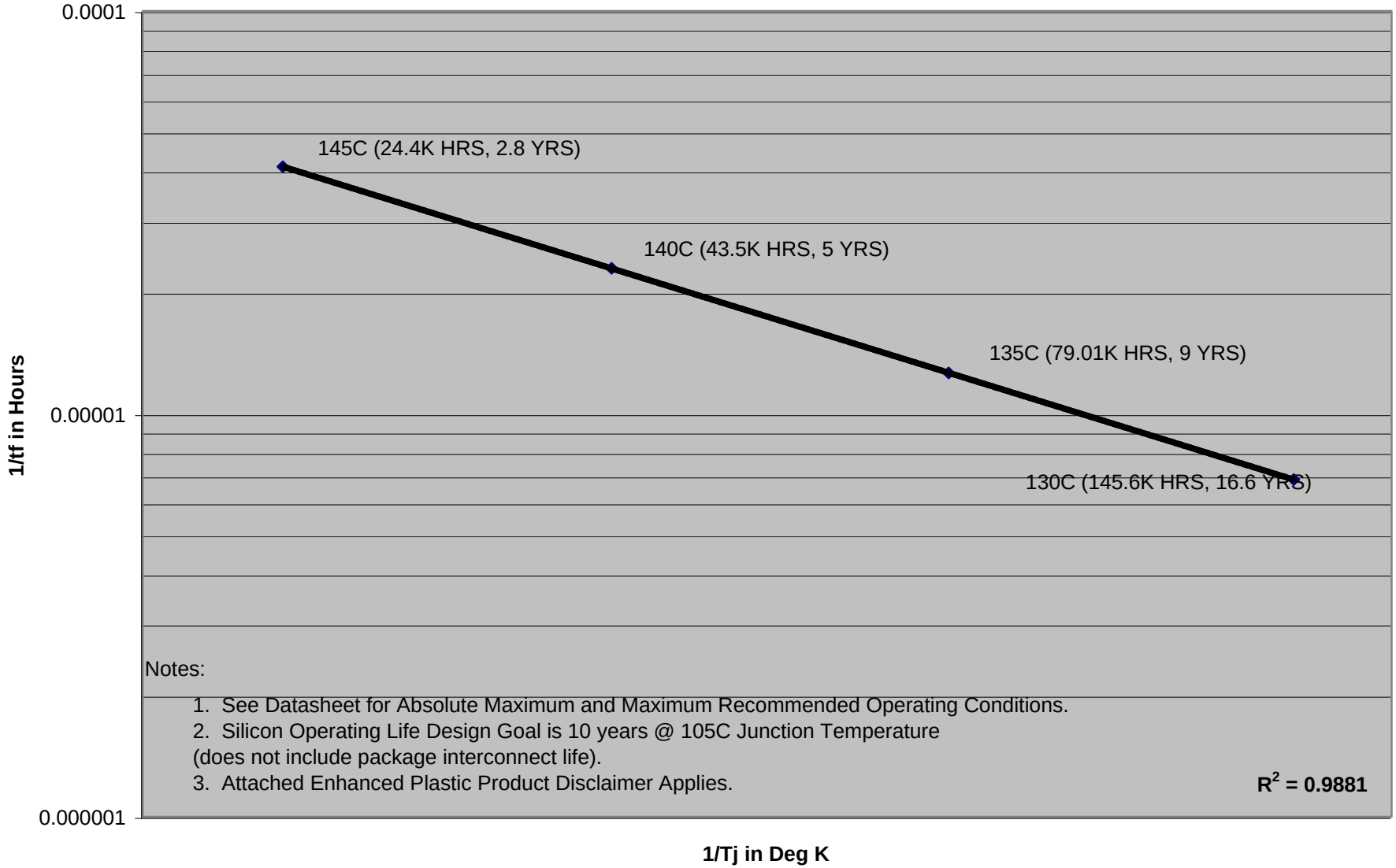
OPERATING LIFE DERATING TABLE - SN74LVC573AQDWREP
1/TF versus 1/Tj in ºK



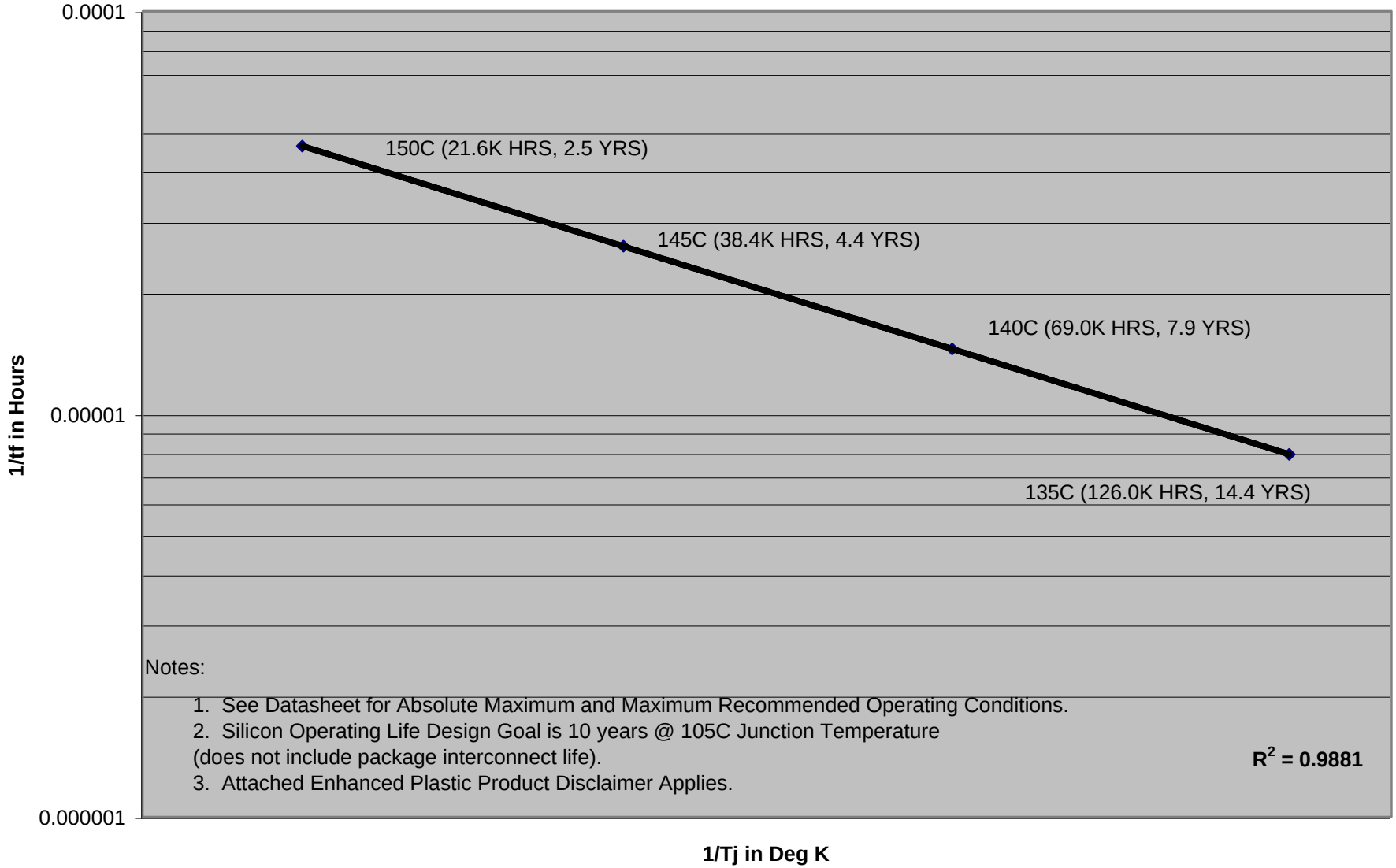
OPERATING LIFE DERATING TABLE - SN74LVC574AQDWREP
1/TF versus 1/Tj in ºK



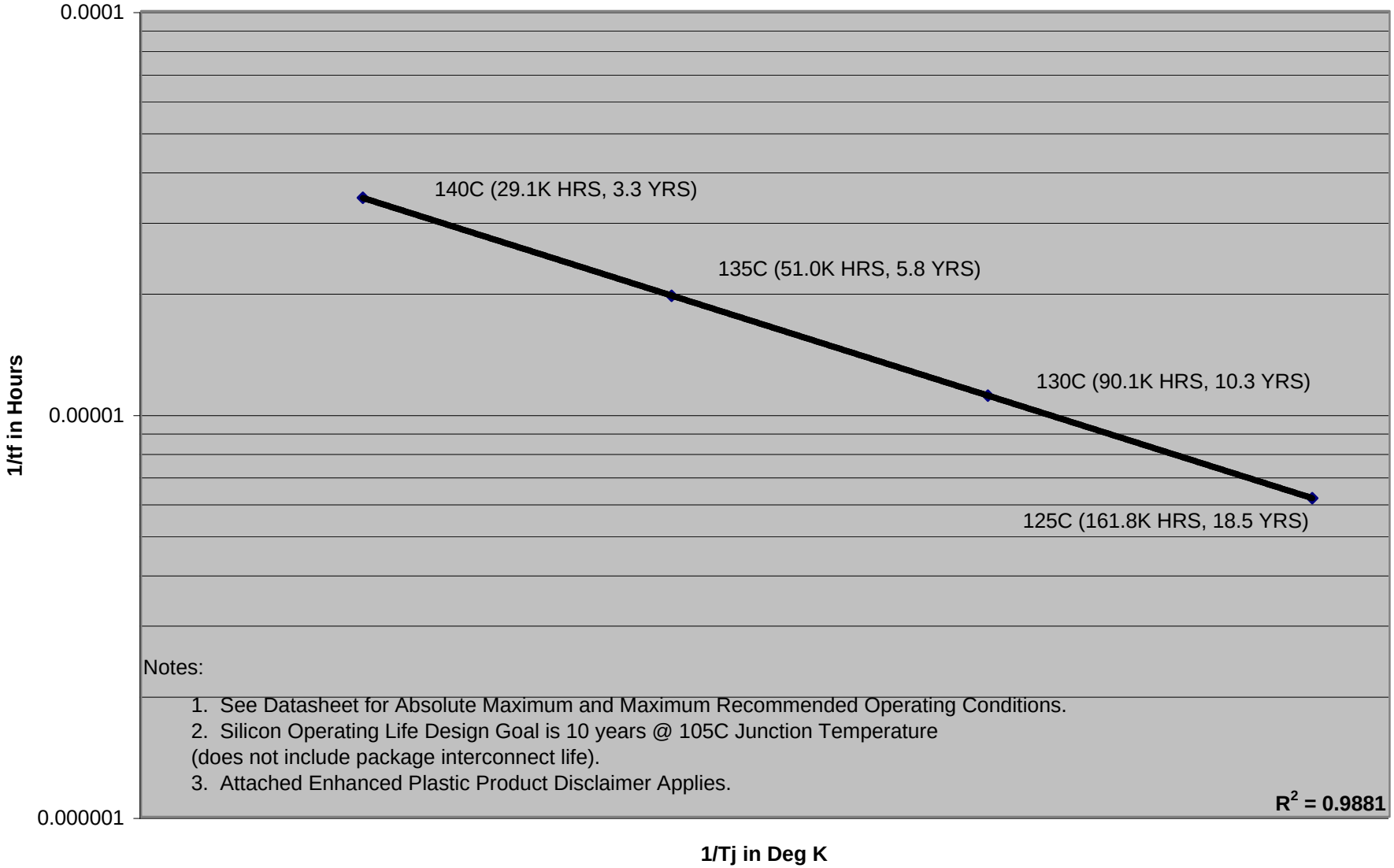
OPERATING LIFE DERATING TABLE - SN74LVTH244AQDBREP
1/TF versus 1/Tj in ºK



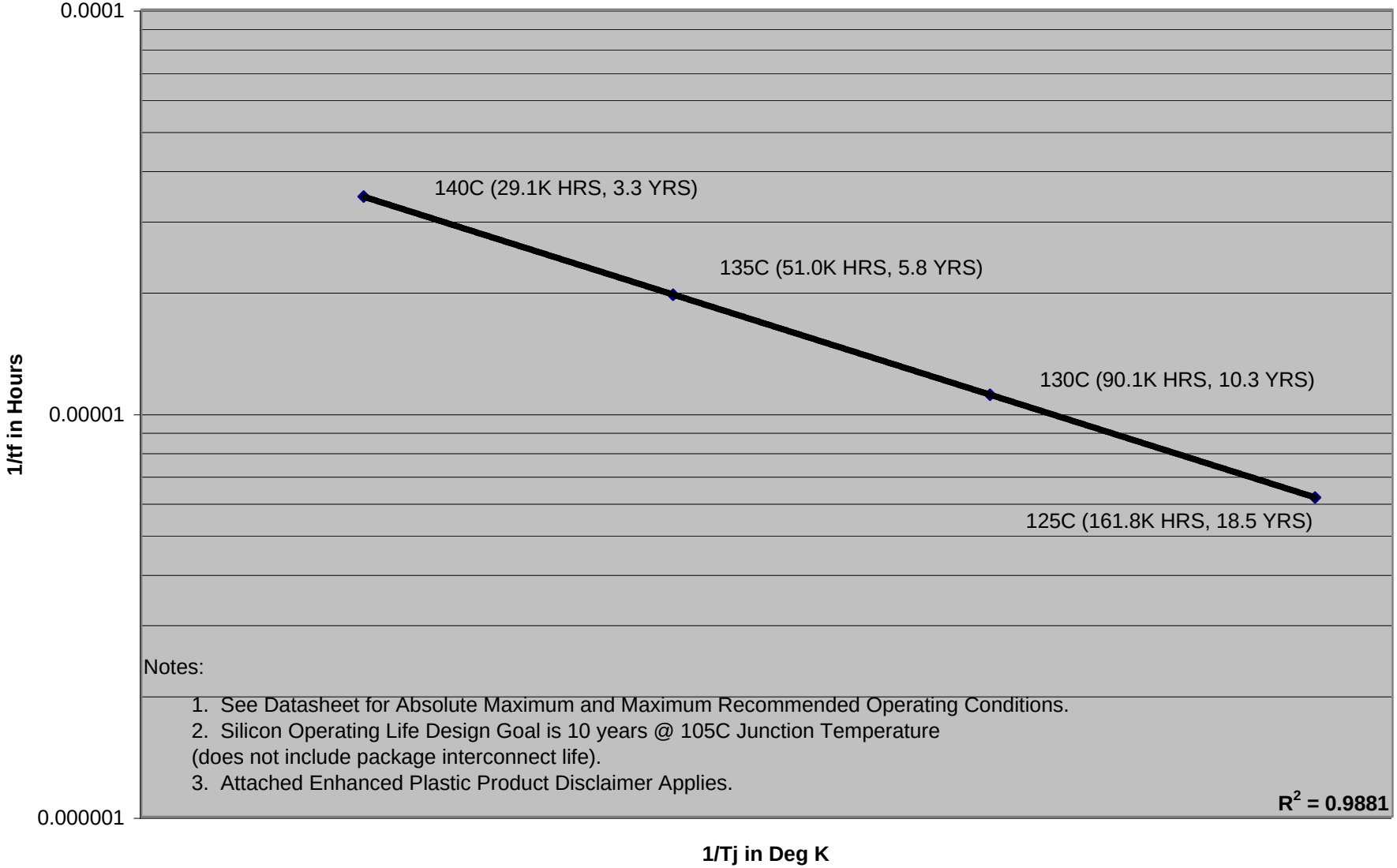
OPERATING LIFE DERATING TABLE - SN74LVTH244AQPWREP
1/TF versus 1/Tj in ºK



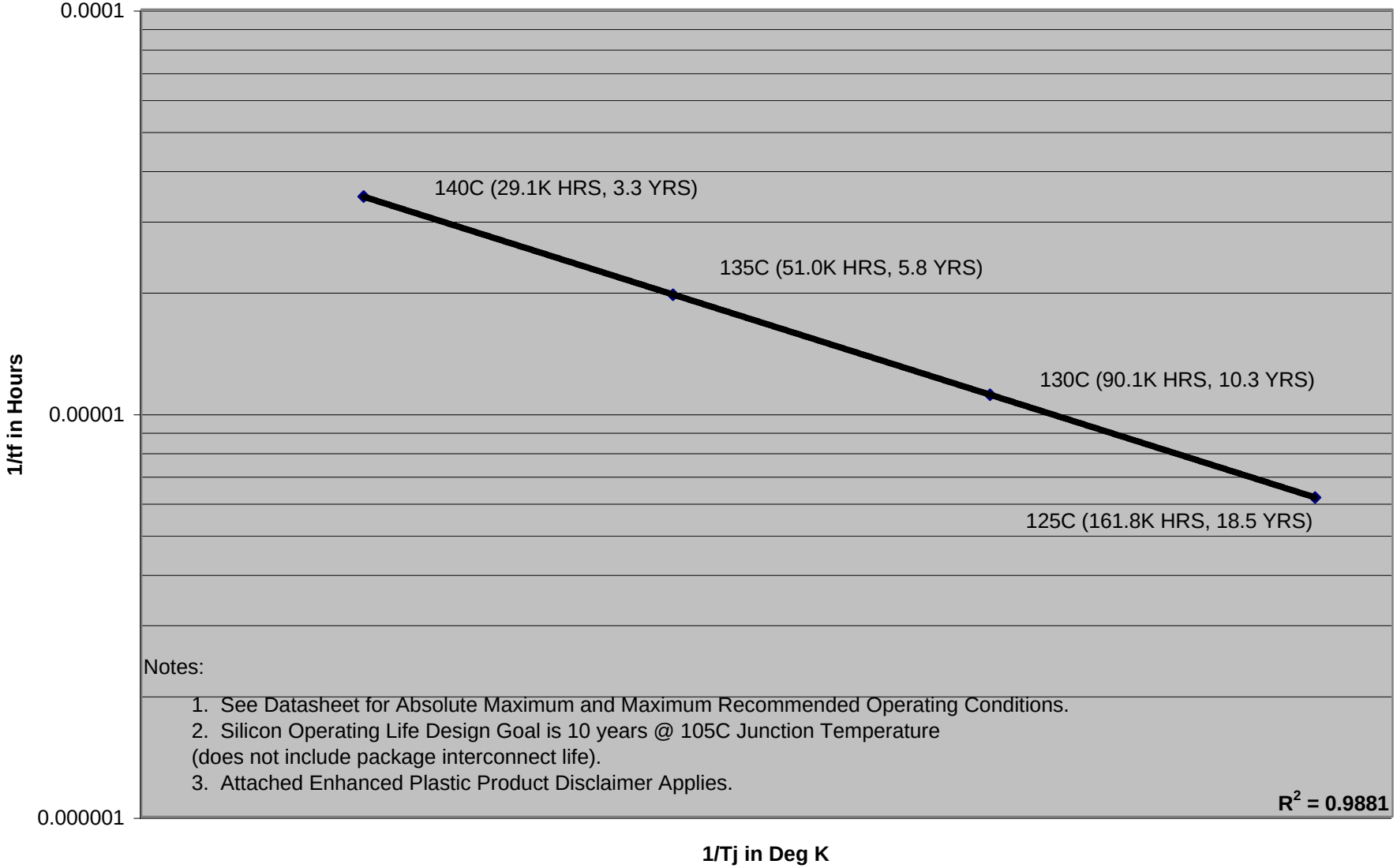
OPERATING LIFE DERATING TABLE - TLC2274xDREP
1/TF versus 1/Tj in ºK



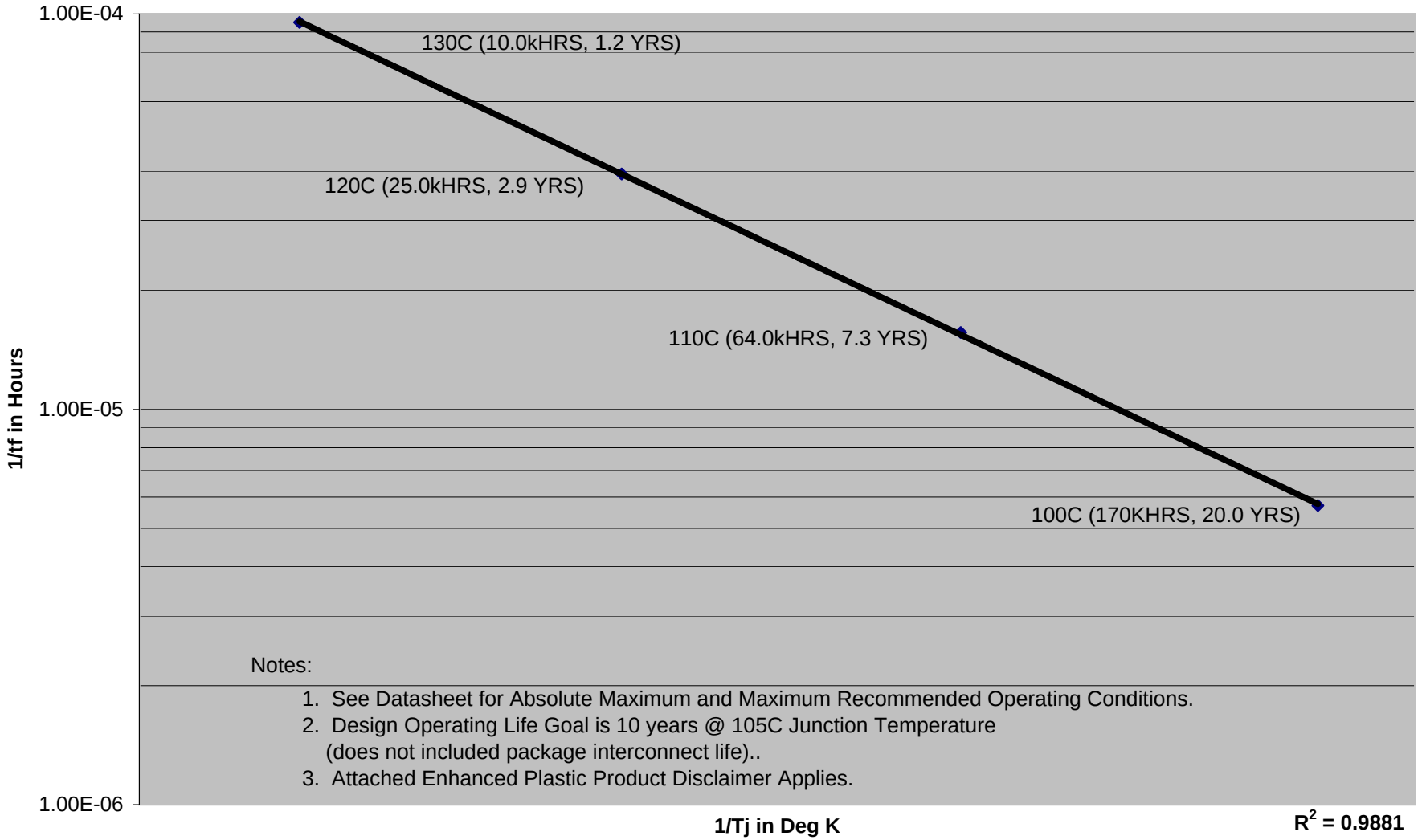
OPERATING LIFE DERATING TABLE - UC1843AMDREP
1/TF versus 1/Tj in ºK



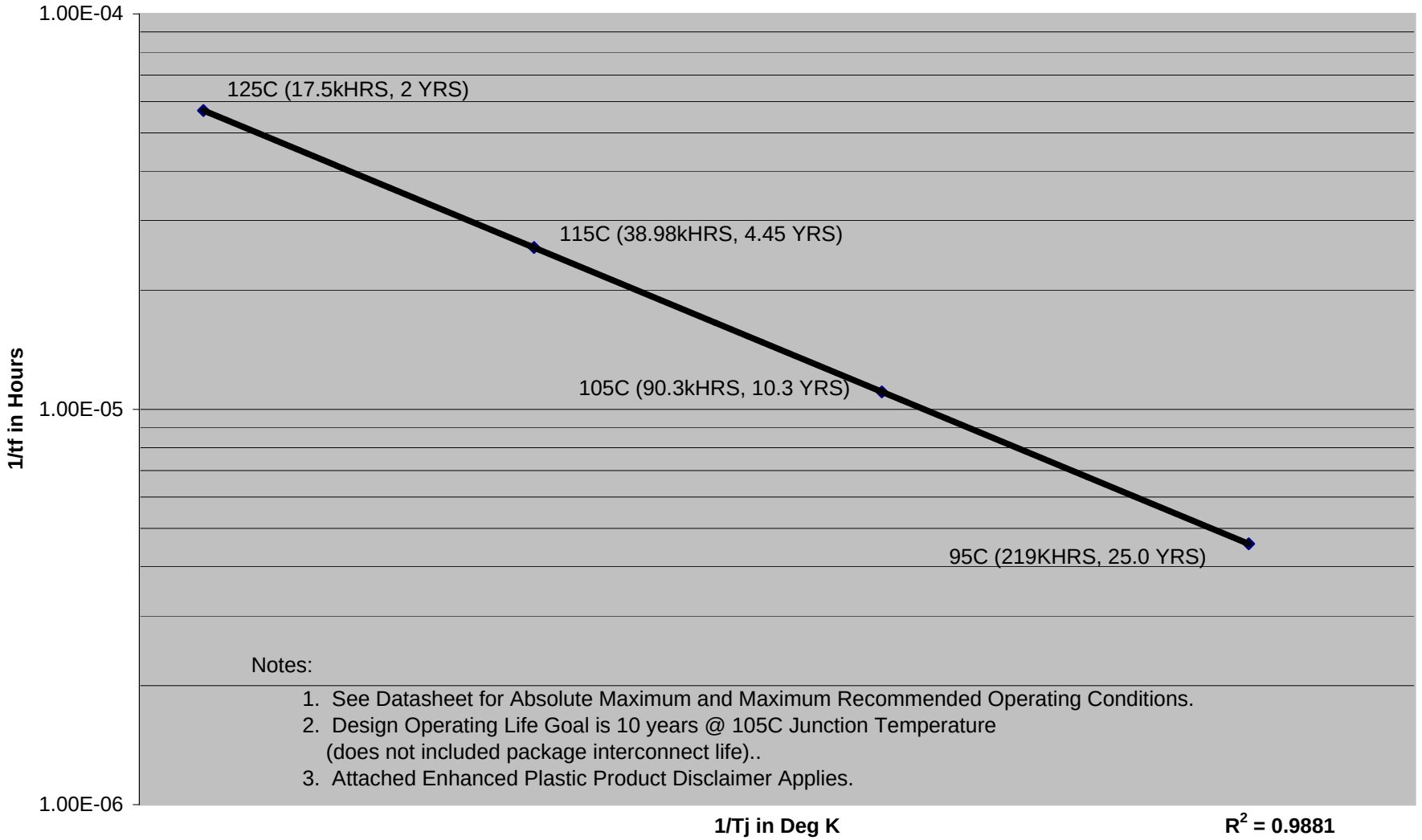
OPERATING LIFE DERATING TABLE - UCC2808AQDREP
1/TF versus 1/Tj in ºK



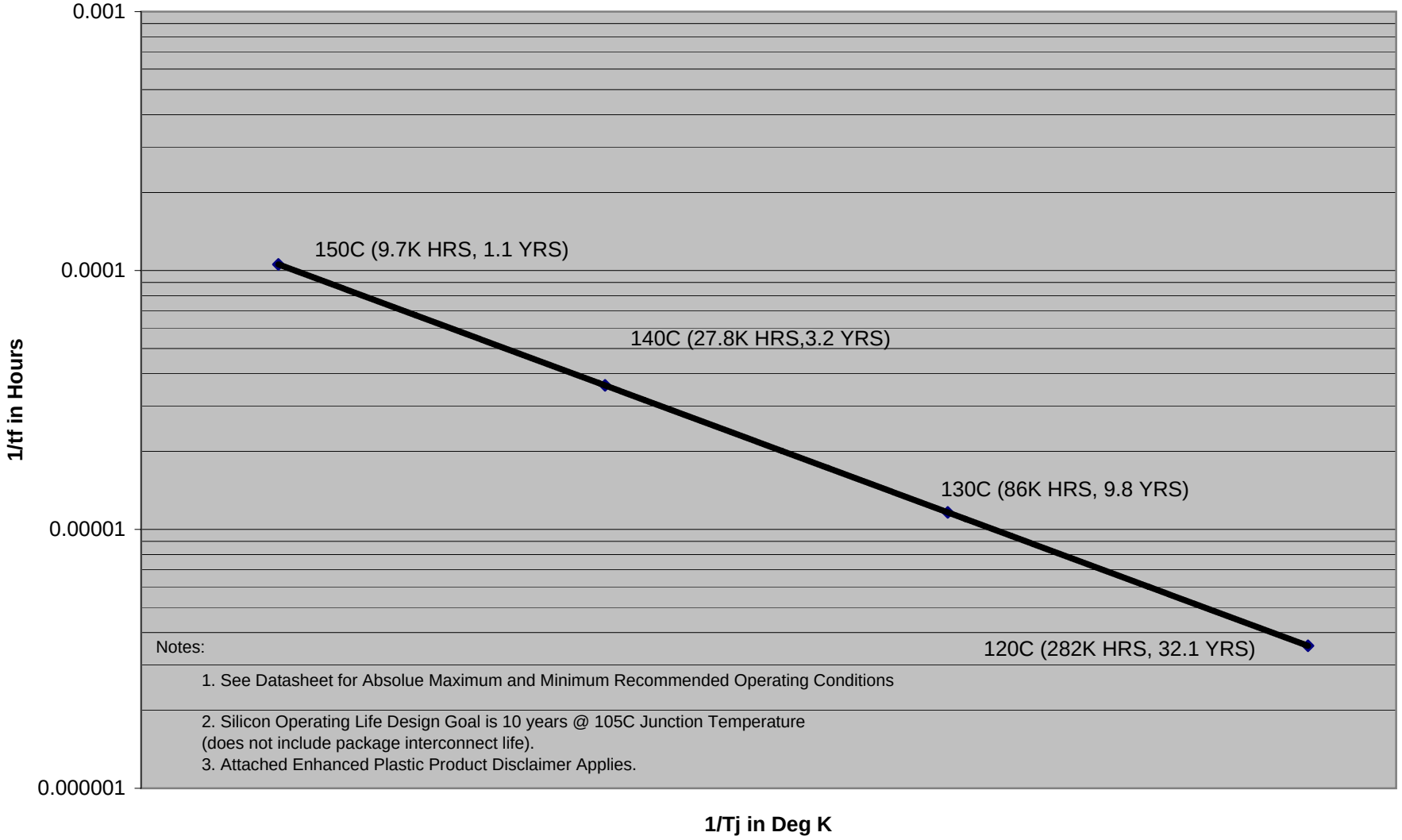
OPERATING LIFE DERATING TABLE - SM320F2812GHHMEP
1/TF versus 1/Tj in ºK



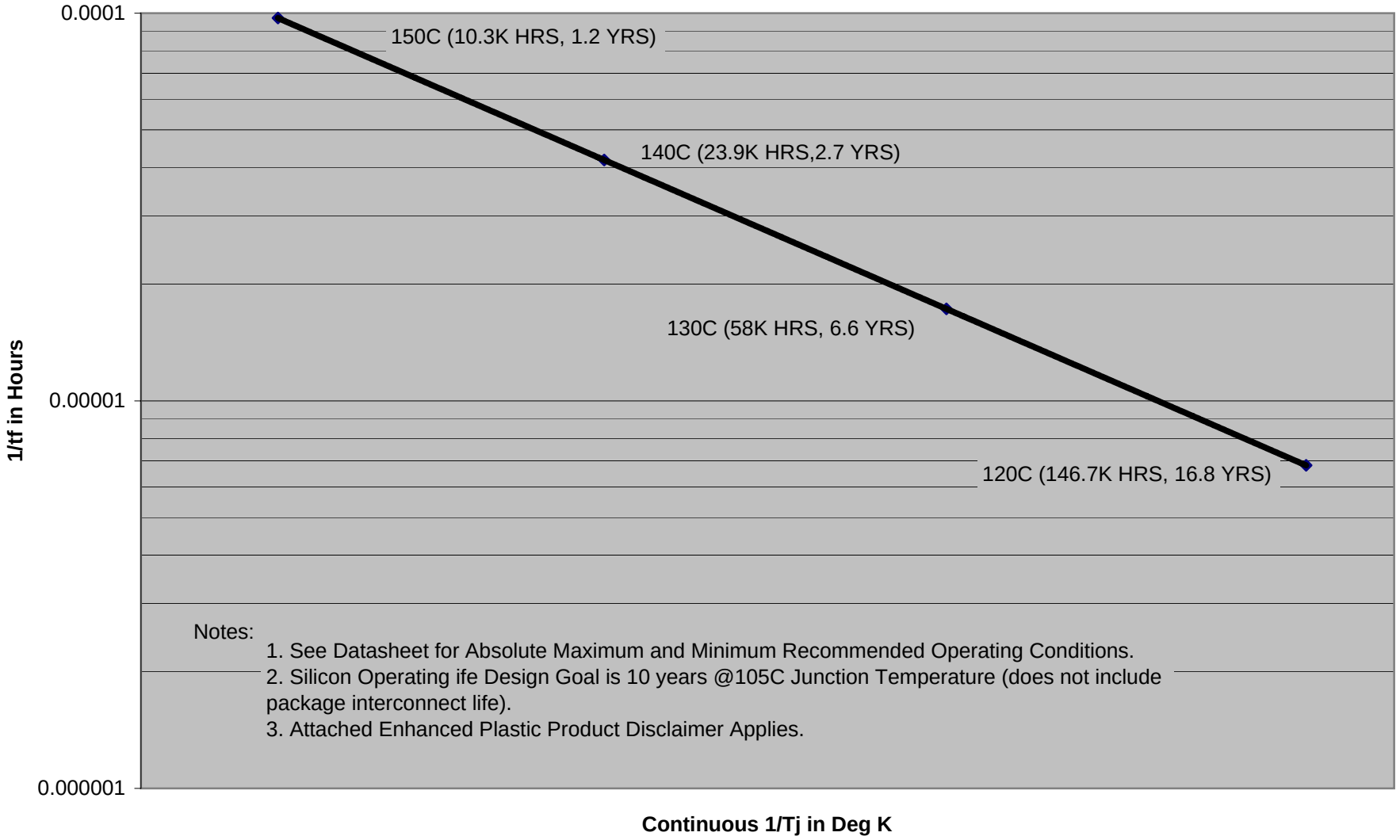
OPERATING LIFE DERATING TABLE - SM320F2812PGFMEP
1/TF versus 1/Tj in ºK



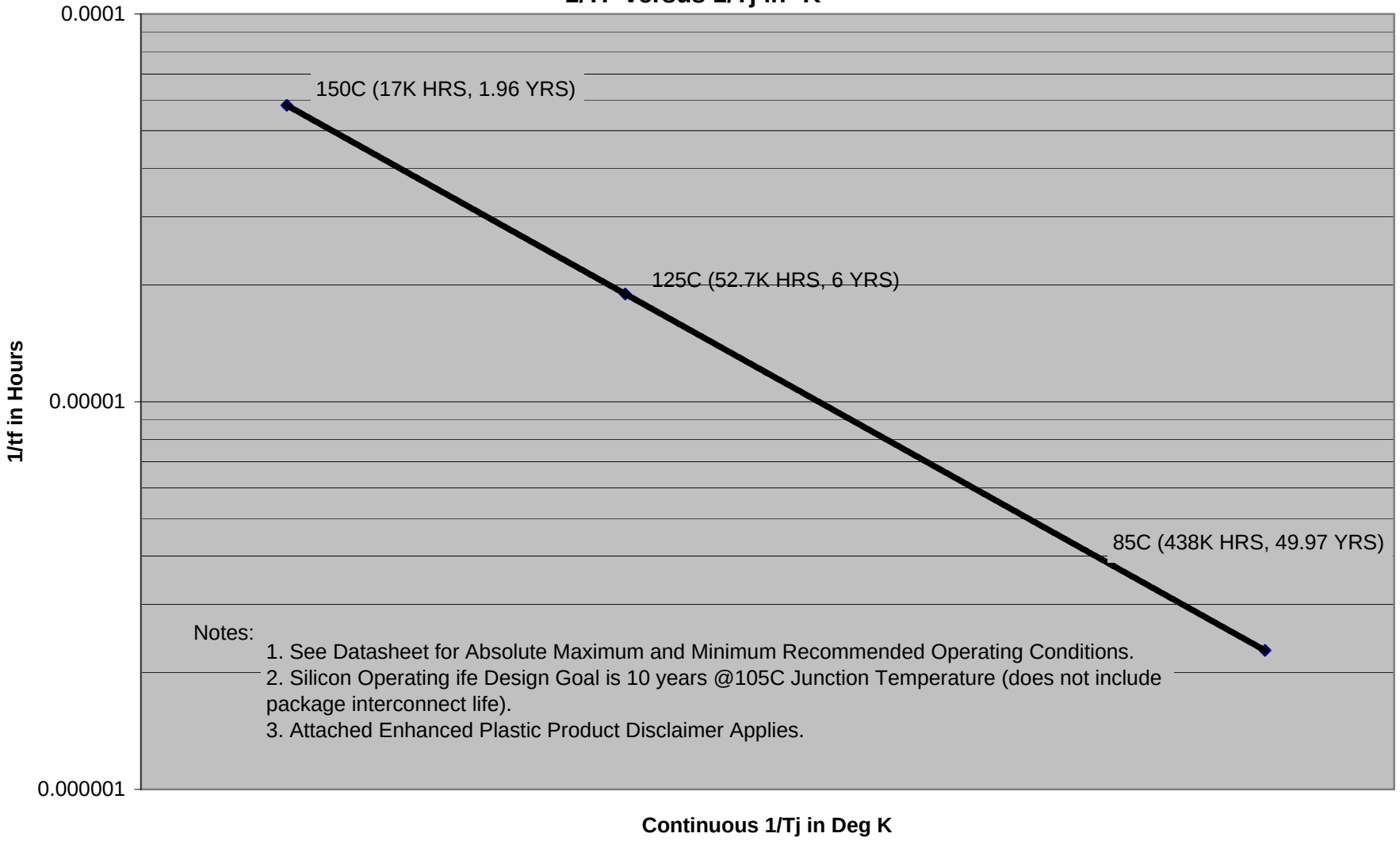
OPERATING LIFE DERATING TABLE - TL441MNSREP
1/TF versus 1/Tj in ºK



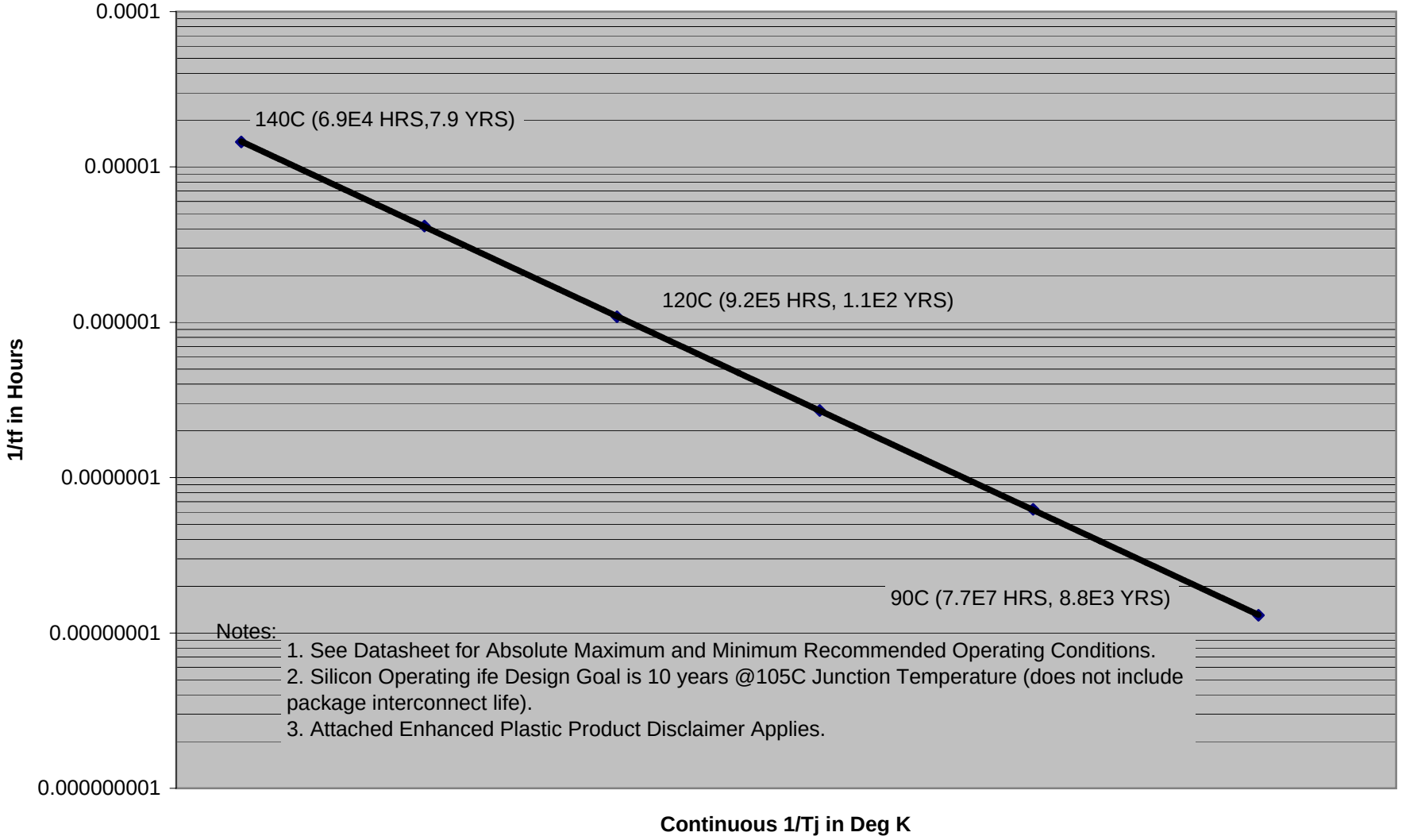
OPERATING LIFE DERATING TABLE TPS3803/3805XXXXDCK
1/TF versus 1/Tj in ºK

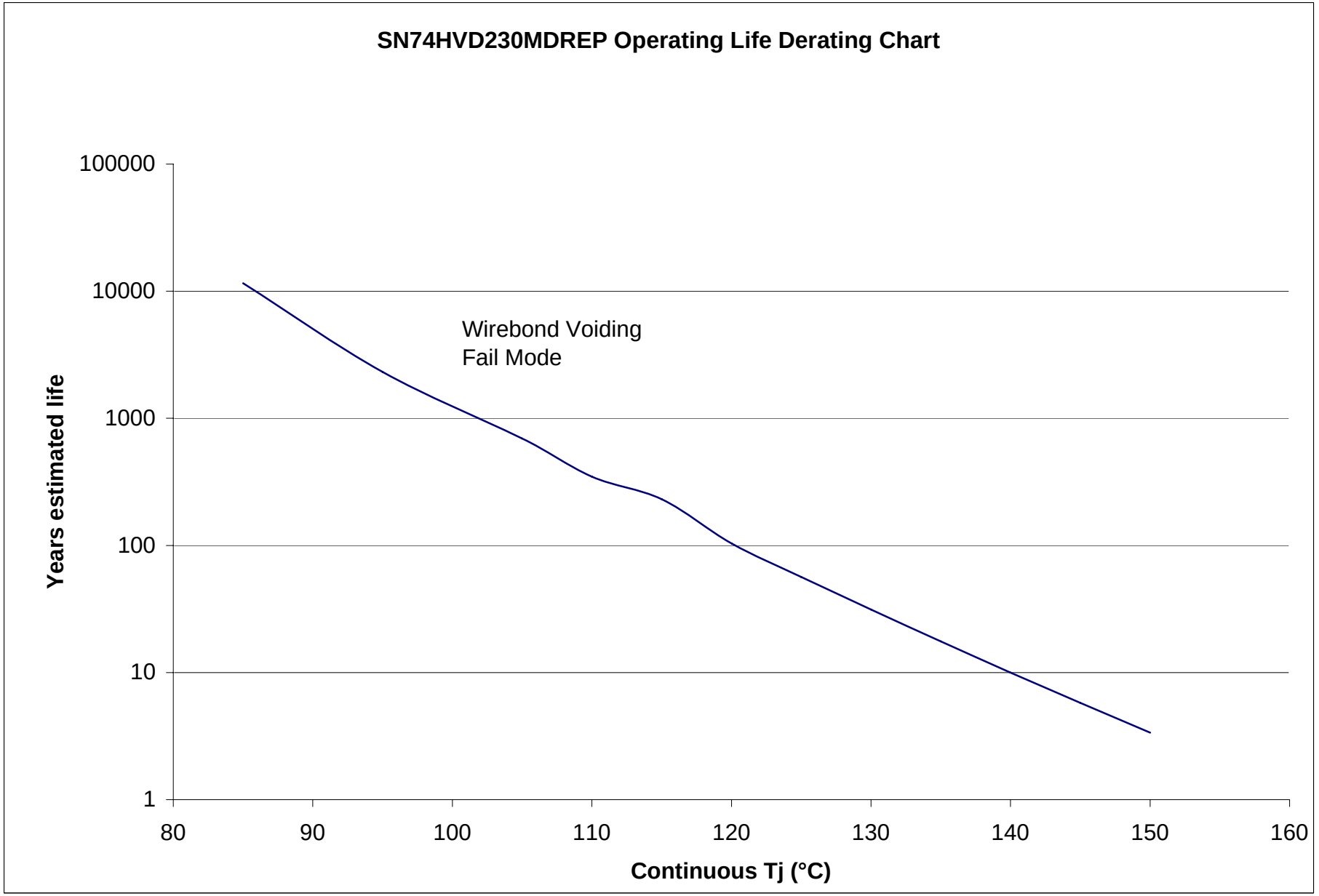


OPERATING LIFE DERATING TABLE 74VMEH22501A
Based on Electromigration Fail Mode
1/TF versus 1/Tj in ºK

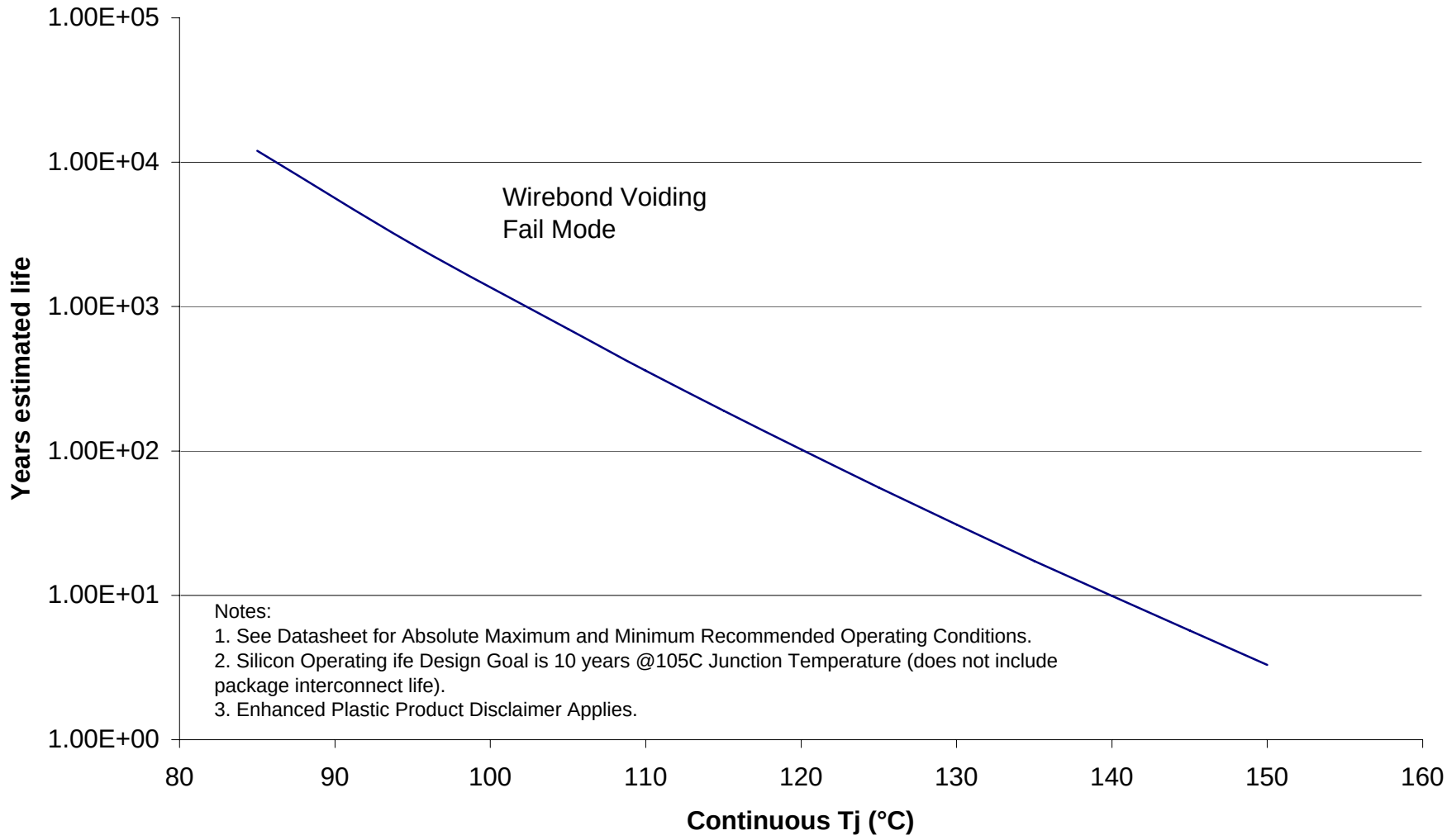


OPERATING LIFE DERATING TABLE TPS40055xPWPxEP
1/TF versus 1/Tj in ºK

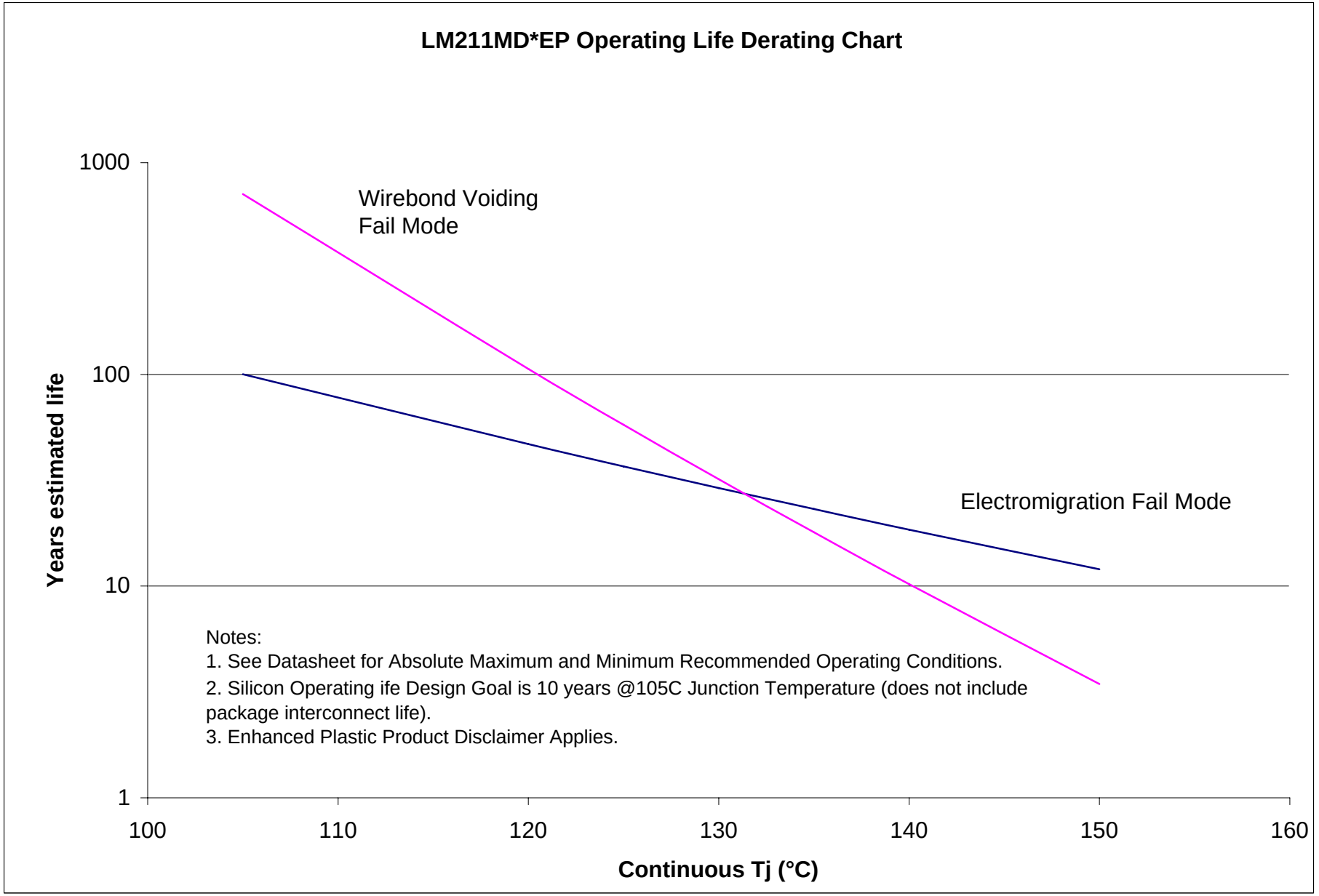



SN74HVD230MDREP Operating Life Derating Chart
Years estimated life
100000
10000
1000
100
10
1
Wirebond Voiding
Fail Mode
80
90
100
110
120
130
140
150
160
Continuous Tj (°C)

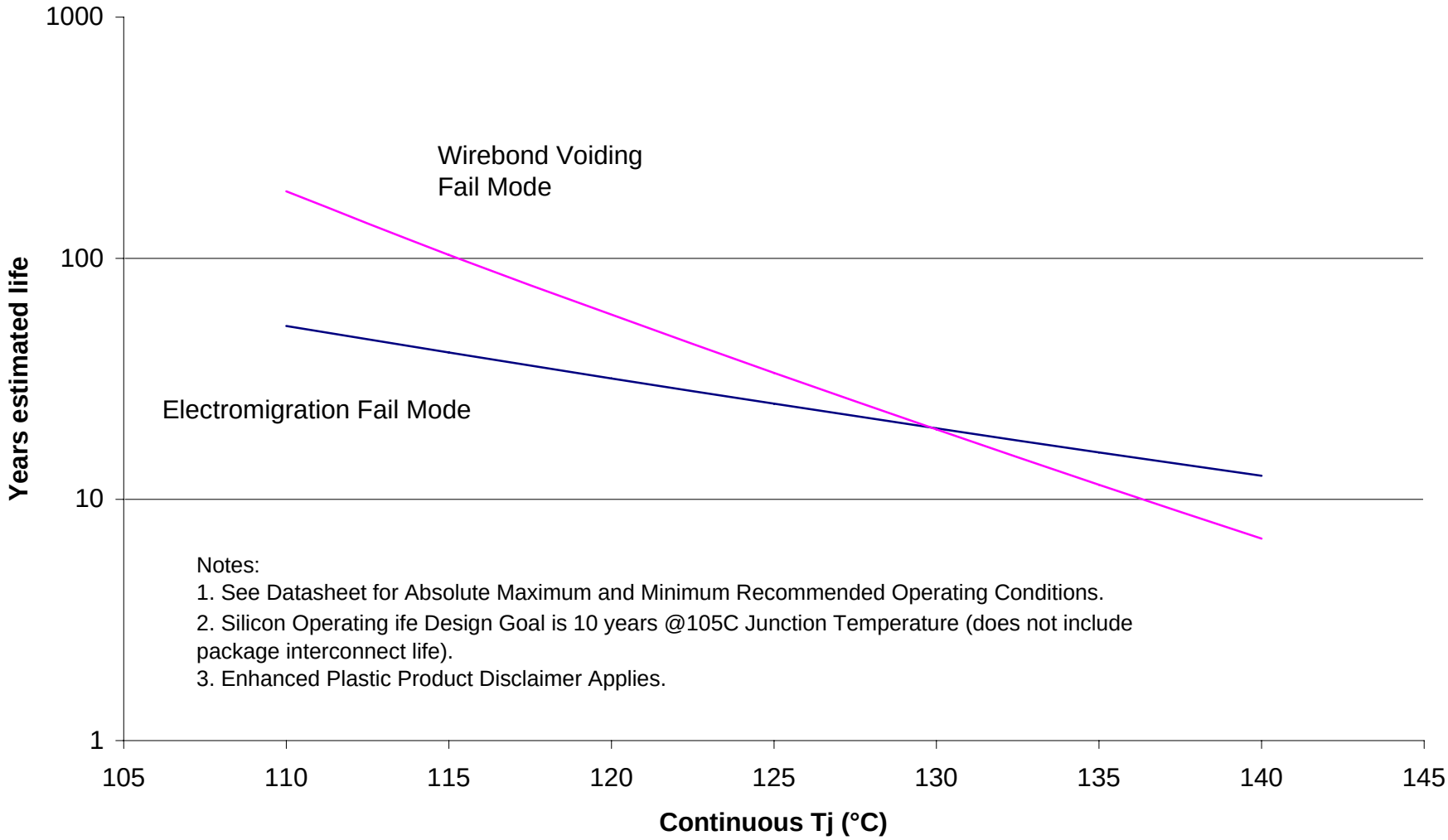
SN74LVTH162373MDLREP Operating Life Derating Chart



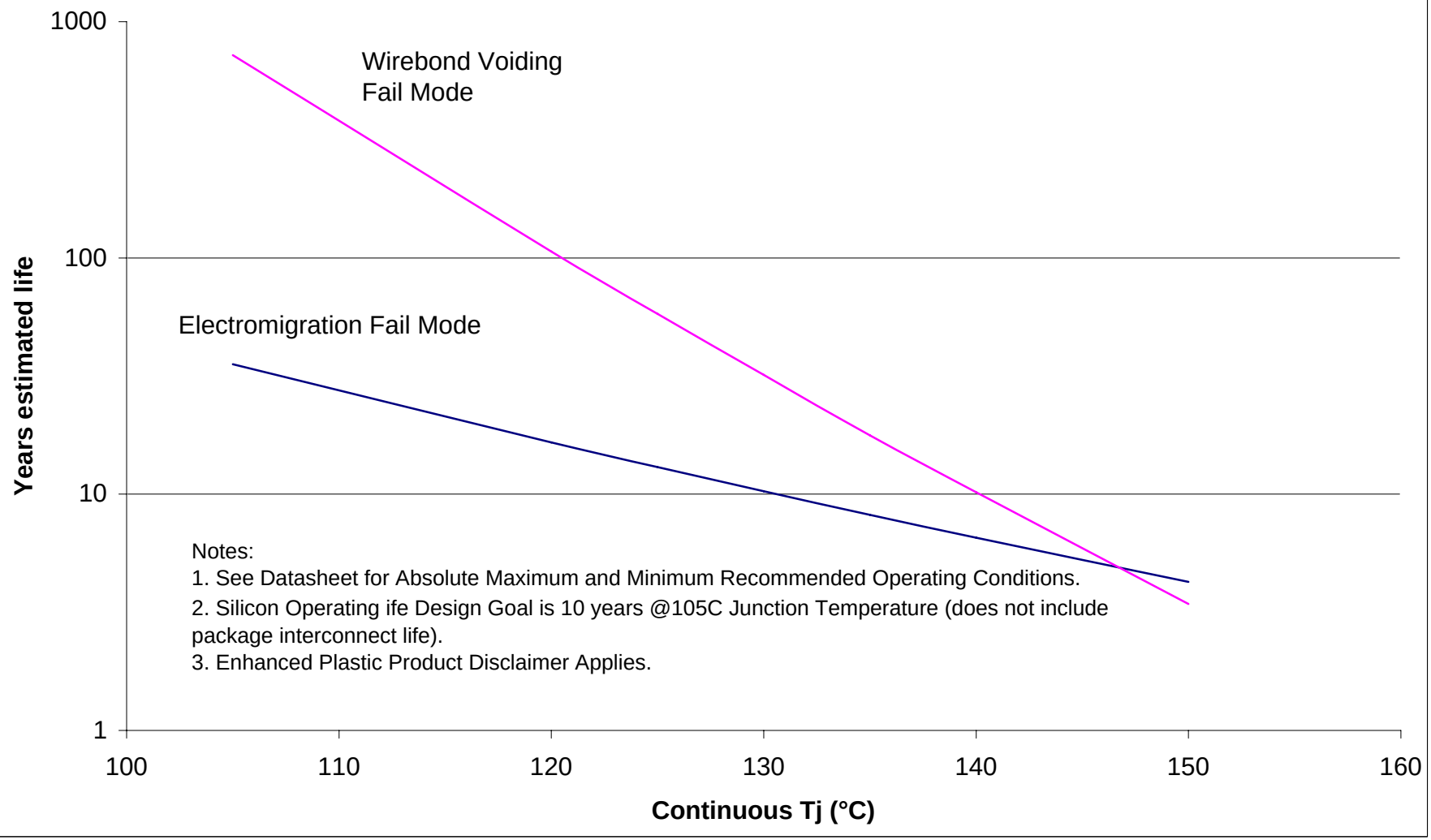
LM211MD*EP Operating Life Derating Chart



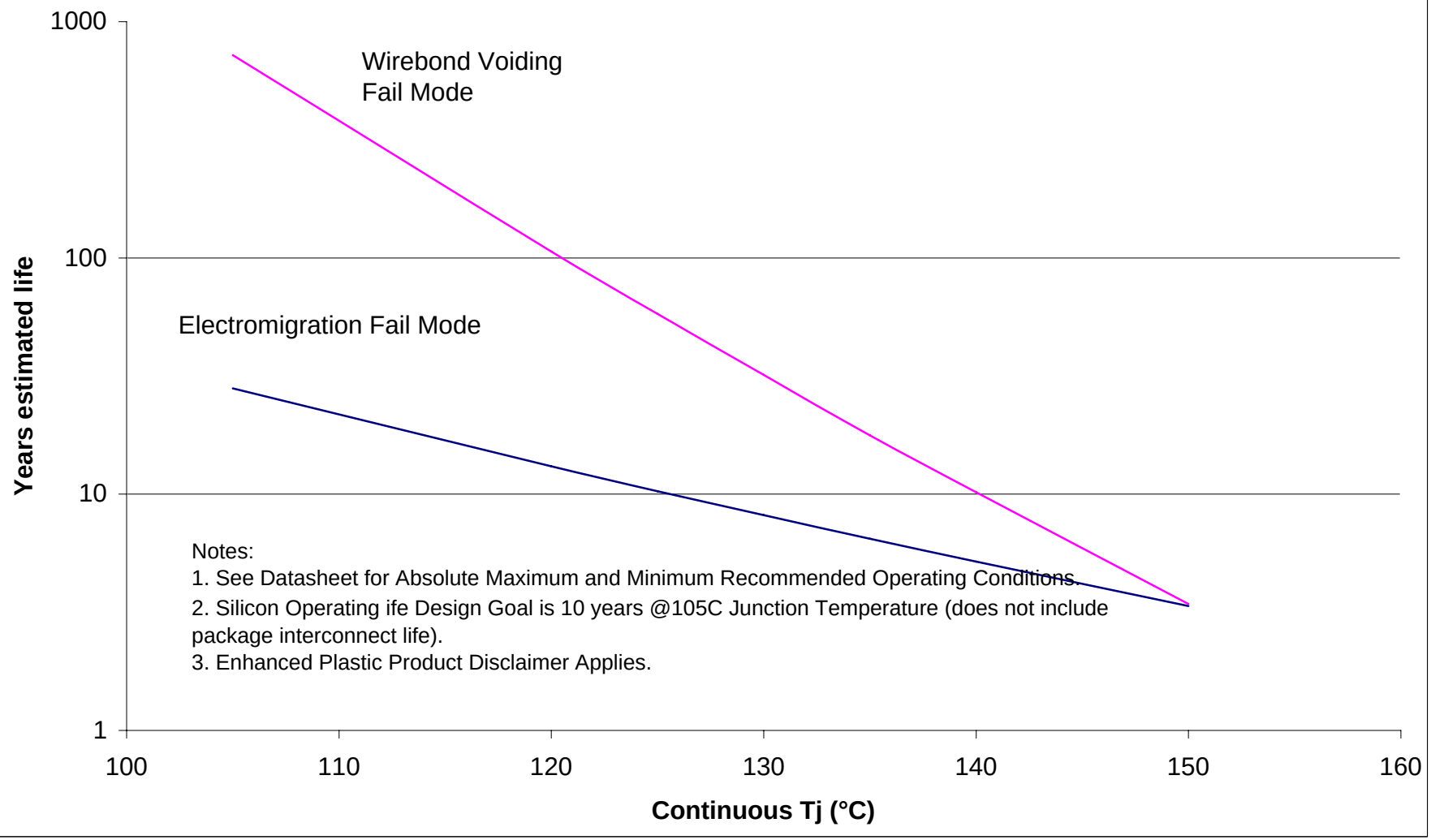
UC2825AMDW*EP Operating Life Derating Chart



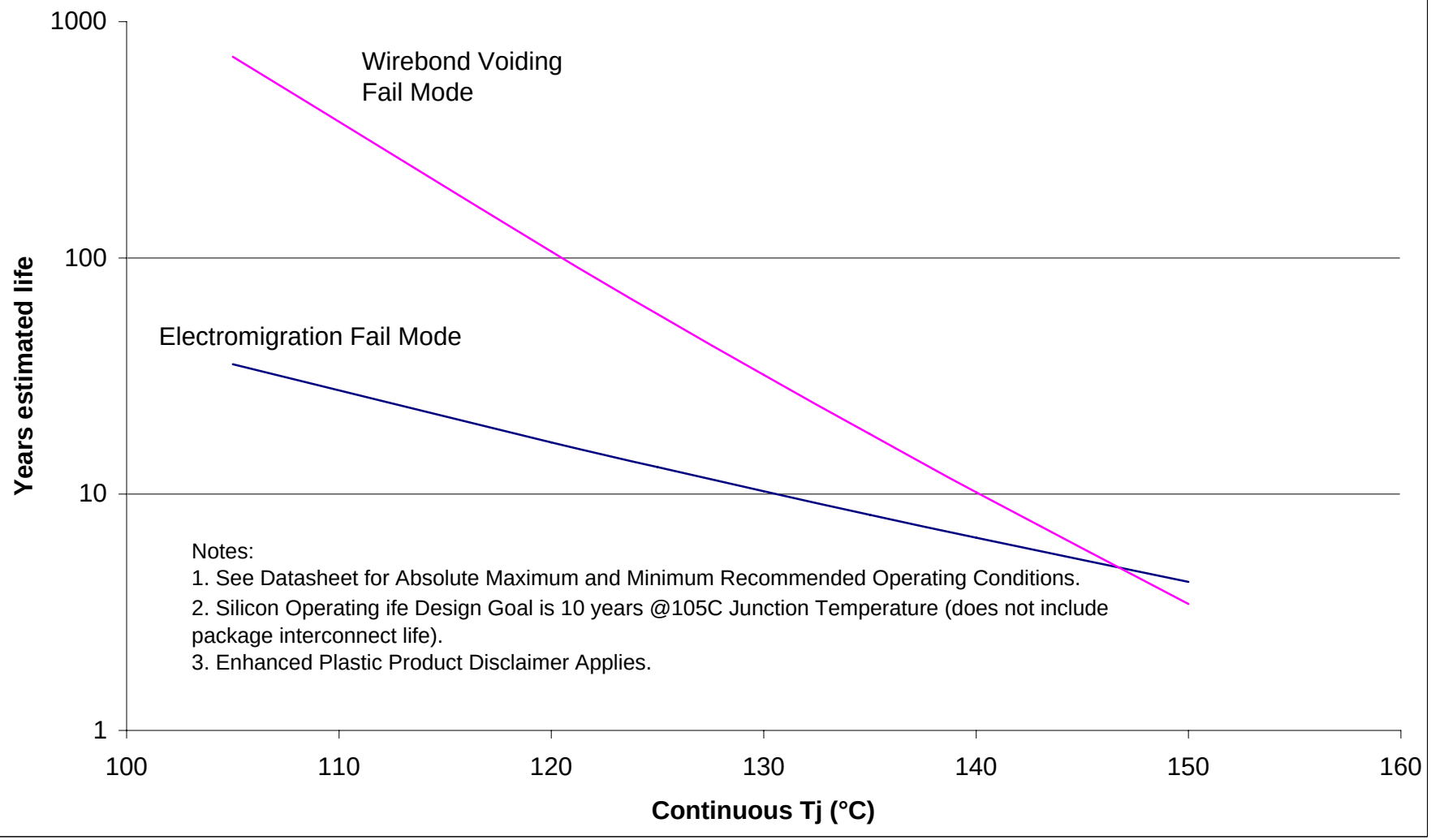
CLVTH16543MDL*EP Operating Life Derating Chart



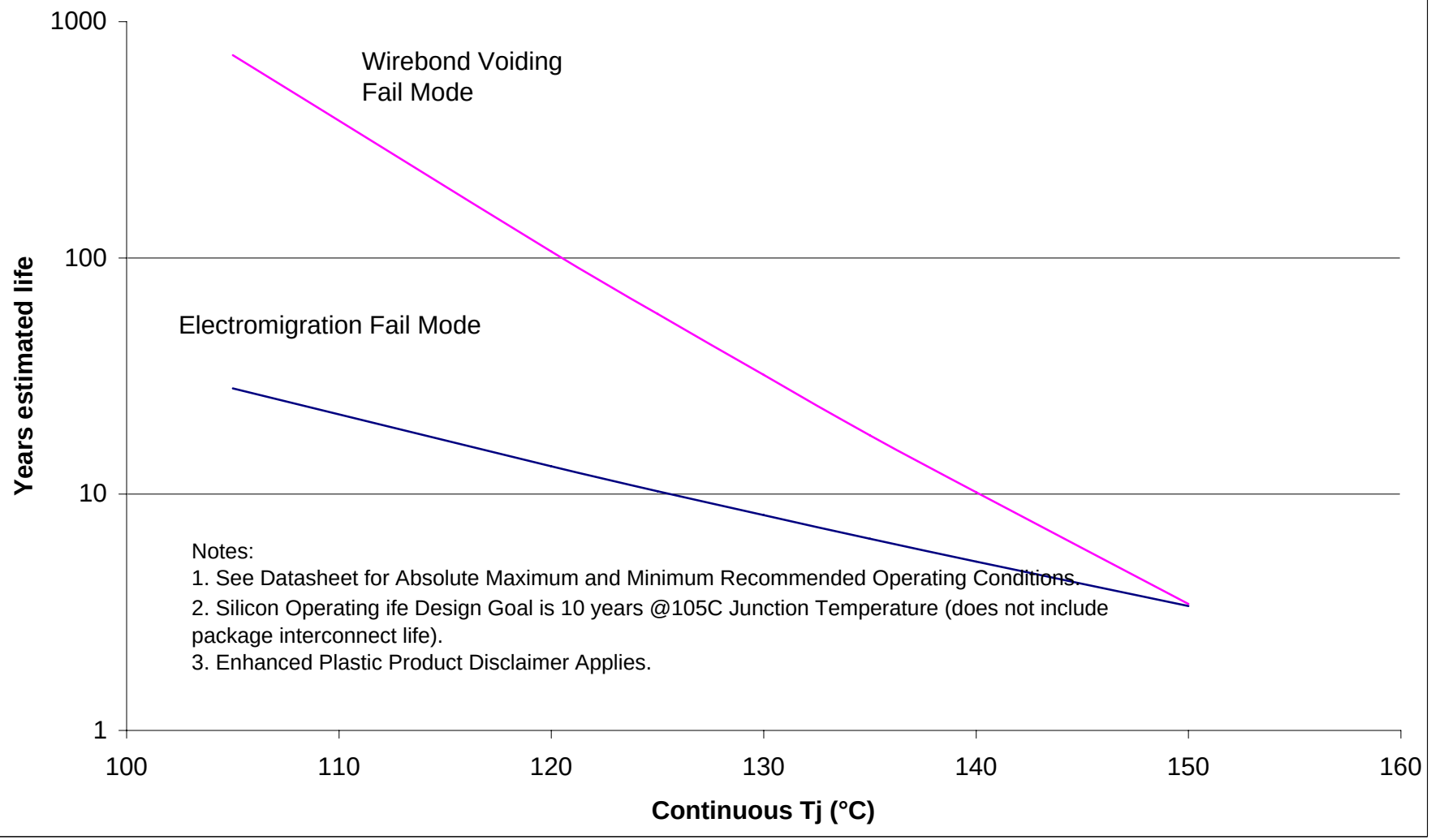
SN74LVTH245AMDB*EP Operating Life Derating Chart



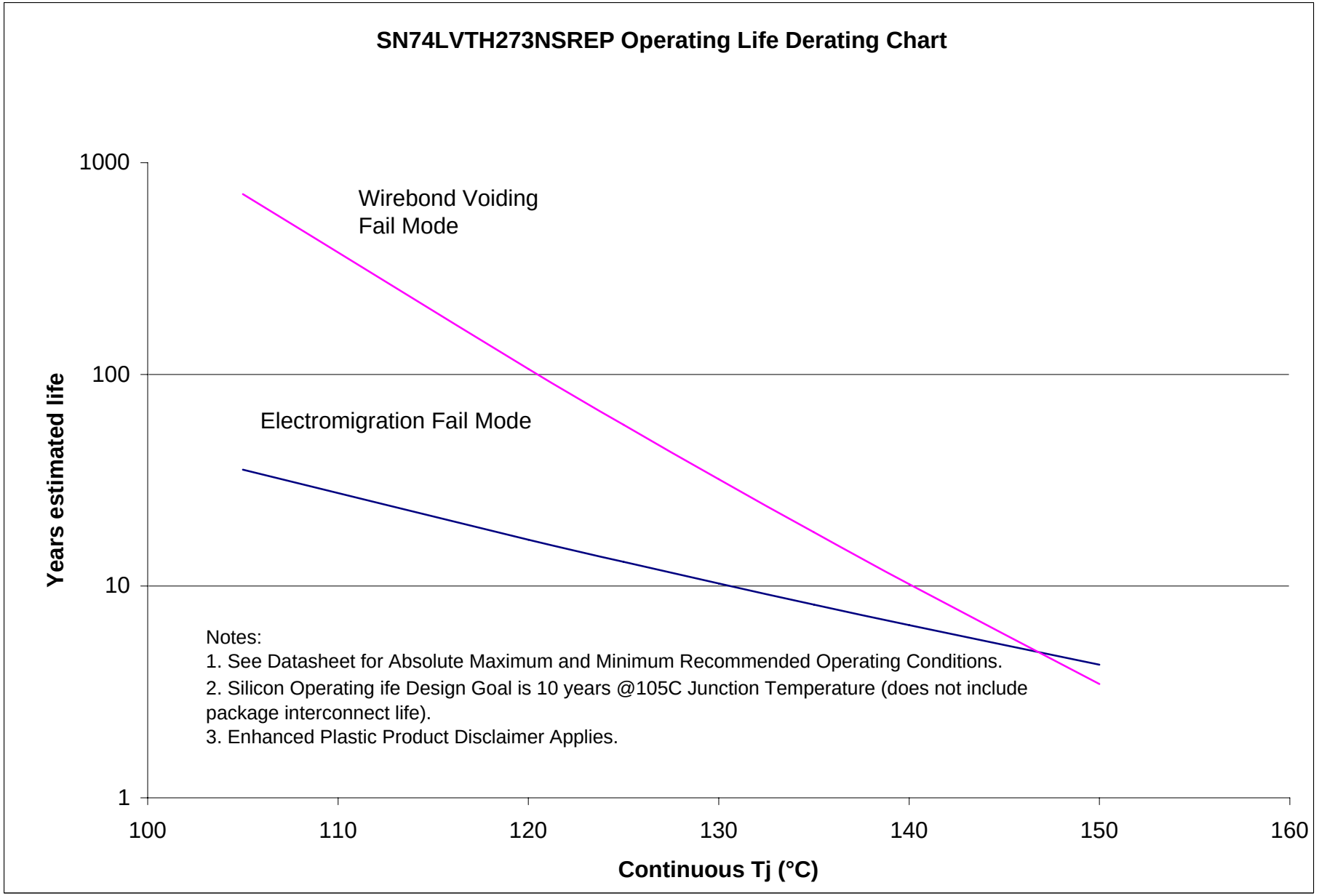
SN74LVTH162245AMDLREP Operating Life Derating Chart



SN74LVTH16245AMDB*EP Operating Life Derating Chart



SN74LVTH273NSREP Operating Life Derating Chart



TLC5940*EP Operating Life Derating Chart