

# Failure Rate Calculation

The steady-state FIT (Failure In Time) rate is calculated =  $\lambda_G \pi_Q \pi_S \pi_T$  (failures/billion hours) per Telcordia Technologies Special Report SR-332, Issue 1, May 2001.

Where:

$\lambda_G$  = chosen from Telcordia SR-332, Table 7-1 ( $\geq 90\%$  upper confidence level)

$\pi_Q$  = 1.0 (from from Telcordia SR-332, Table 7-4 for Quality Level II)

$\pi_S$  = 1.0 (from from Telcordia SR-332, Table 7-6, assuming 50% electrical stress level)

$\pi_T$  = 2.0 (calculated for +85°C per Table 7-7 with  $E_a$  activation energy = 0.15 eV)

RF Magnetics	Steady state FITs (failures/billion hours)	MTBF* (hours)
Chip inductors (all sizes)	1.0	1,000,000,000
Air core "Spring" inductors (all sizes)	1.0	1,000,000,000
90 Series axial lead inductors	1.0	1,000,000,000
RFID transponder coils	1.0	1,000,000,000
Tunable inductors (Unicoils, Slot Series)	2.0	500,000,000
Conical broadband inductors	38	26,315,789
Wideband RF transformers, chip transformers, baluns, directional couplers	60	16,666,667
Power Magnetics	Steady state FITs (failures/billion hours)	MTBF* (hours)
Power chip inductors (PS, FS – all sizes)	38	26,315,789
SMT inductors (DH, DO, DS, DT, EPL, LPD, LPO, LPS, ME, MLC, MOS, MSD, MSS, MVR, SER, SLC and XxL Series)	38	26,315,789
Coupled power inductors (LPD, MSD, PFD)	38	26,315,789
Fixed inductors (PCH, PCV, DMT, Mag Amps, etc.)	38	26,315,789
Transformers (including base/gate drive, power factor controller, planar and CCFL)	38	26,315,789
Current sensors	38	26,315,789
EMI Magnetics and LC Filters	Steady state FITs (failures/billion hours)	MTBF* (hours)
Filter coils (including PDLF, PTRF, CCDLF, TTDLF, DLF)	38	26,315,789
Common mode chokes (including DLF, PDLF, CCDLF, TTDLF, TRF, PTRF, TTTRF, P32xx, BU, USB Series)	38	26,315,789
Filtered connectors (including TRFRJ, PCRJ, DLC)	38	26,315,789
Filter assemblies (including PxLP and SxxP)	12	83,333,333
xDSL Magnetics	Steady state FITs (failures/billion hours)	MTBF* (hours)
xDSL transformers	38	26,315,789

\*Calculated from FITs (MTBF=10<sup>9</sup> (hours) / FITs)



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