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LIST OF NOTATIONS

A	limiting availability
$\bar{A}$	limiting unavailability
A_o	objective value of availability
A_e	estimated value of availability
A	Arrhenius acceleration factor
$A_{b,c}$	Arrhenius acceleration factor during burn-in
$A_{b,d}$	acceleration factor due to device burn-in
A_{bi}	Arrhenius factor for burn-in
$A_{b,s}$	Arrhenius acceleration factor during system burn-in
A_{OP}	acceleration factor during infant mortality due to normal product operating temperature
A_{op}	Arrhenius acceleration factor for the operating temperature relative to 40° C
A^{1-a}	failure rate multiplier
a(t)	availability at time t
a	number of units under repair
B(s,a)	probability of system outage due to lack of spares
E_a	activation energy in electron volts (eV)
F(t)	cumulative distribution function
f(t)	probability density function
FIT_{LT}	failure rate during long term region
k	Boltzman constant, 8.6×10^{-5} eV/°K
m	number of devices in a unit
m(t)	probability density function of repair time
M (t)	cumulative distribution function of repair time
N	number of units starting a test (population in-service)
NRT	number of units under repair
P_A	probability that element A is working
$\bar{P}_A$	probability that element A is not working
R	component failure reaction or process rate/replaccment rate
R_o	constant
RIT_{IM}	average infant mortality replacement rate

$R(\tau)$	reliability function
S	number of spares
S_{ico}	incremental average number of central office spare units needed over the average number of service life to allow for infant mortality
S_{im}	spares required during infant mortality period
S_{IPICS}	incremental PICS spare units attributed to infant mortality
SL	service life
t	time
t_{bi}	actual burn-in time
t_{eff}	effective burn-in
t_f	time to failure
$t_{b,c}$	unit burn-in time
$t_{b,d}$	device burn-in time
t_{ei}	effective burn-in time
t_L	transition point from infant mortality to steady-state using reliability theory (t_L - 10^4 hrs)
t_x	transition point from infant mortality to steady-state
t_{yr}	first annual period of interest in Life Cycle Cost Analysis (t_{yr} - 8,760 hrs)
t'	operation time subsequent to bum-in
T	average lead time (time interval between the time when an office/area requests or orders a replacement and the time when the new spare arrives in the office/area)
$T_{b,c}$	unit bum-in temperature (°C)
$T_{b,s}$	system bum-in temperature (°C)
Top	unit operating temperature (°C)
U_{sco}	adjustment factor related to SCO
V_{cc}	power supply voltage
a	constant for Weibull distribution during infant mortality region (Weibull slope *parameter)*
Δt	time interval
λ	failure rate
$\lambda(t)$	hazard rate at time t

$\lambda'(t)$	failure rate after burn-in
$\lambda^*(t)$	adjusted failure rate
λ_I	initial failure rate
λ_{EQUIP}	total equipment failure rate
λ_L	constant failure rate in the steady-state region
λ_{op}	unit steady-state failure rate (excluding the environmental factor (π_E))
λ_{OP_i}	device steady-state failure rate
λ_{ss}	steady-state failure rate
μ	average repair rate
π_E	environmental factor
π_{IM}	infant mortality failure rate multiplier
π_Q	quality factor
π_s	stress factor
π_T	temperature factor
σ	standard deviation
Π	product sign
Σ	summation sign
$\cap$	logical AND in set theory
$\cup$	logical OR in set theory

LIST OF ABBREVIATIONS

ATP	All tests passed
BOC	Bell Operating Company
CAF	Conductive anodic filament
CCD	Charge-coupled-device
cdf	Cumulative distribution function
CF	Cost per failure
CMOS	Complimentary metal-oxide semiconductor
CO	Central office
DIP	Dual in-line package
DLD	Dark-line defects
DOAs	Dead on arrivals
DOFS	Device operating failures
ECC	Error correction code
EDAC	Error detection and correction
ESD	Electrostatic discharge
ESS	Electronic switching system
FIT	The failure rate unit (a failure in 10^9 device hours)
FMA	Failure mode analysis
GDX	Gated diode crosspoint
HIC	Hybrid integrated circuit
IC	Integrated circuit
IR	Insulation resistance
LED	Light-emitting diodes
LSI	Large scale integrated circuit
MDI	Mean downtime
MLB	MultiIayer boards
M0S	Metal oxide semiconductor
MSI	Medium scale integrated circuit
MTBF	Mean-time-between-failure
MTTF	Mean-time-to-failure
MTTR	Mean-time-to-repair
NTF	No trouble found

OLT	Operational life testing
ORU	Optimum replacement unit
pdf	Probability density function
PF	Percent failure
PICS	Plug-in inventory control system
PPS	Product performance survey
PW	Present worth
RAM	Random access memory
RF	Radio frequency
RITs	Replacements in 10^9 unit hours of operation
RTV	Room temperature vulcanizing
SCO	service continuity objective
SSI	Small scale integrated circuit
STARS	Sales tracking and reporting system
TED	Transmission equipment device
TTL	Transistor transistor logic
VLSI	Very large scale integrated circuit

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