

# SafeFit Reference: MIL-217F

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Rev. 01

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**SAFETWICE**

# Change Control

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# Abstract

This document lists all supported parameters in SafeFit for the standard **MIL-217F**.

Names in the **Parameter** column are the exact string of CSV columns recognized by SafeFit. The **Value** column indicates possible values, which can be:

- Designator specification, e.g. **R<Num>[<Char>]**. This means: a letter, an integer (any number digits), and an optional upper case character, e.g. **R1A**, **R15**, etc.
- Integer ranges, e.g. **x >= 0**.
- Real number ranges, e.g. **x >= 0.0 [W]**. Characters between square brackets **[]** specify the units in SI format (generally).
- Enumeration values, e.g. **RCR (1)**, **RM (6)**. As with parameter names, these exact names are required for successful recognition. *Additionally*, their index in the list of values can also be used (zero-based). For a resistor, **RCR** is 1, and **RM** is 6.

Sensitivity tables indicate which parameters are required to compute the FIT for a given component type. Some require all, a few depend only on global parameters, and the rest depend on a subset.



# 1 Resistors

## 1.1 Parameters

Parameter	Value
Designator	R<Num>[<Char>] (e.g. R1A)
Description	Text
FIT	x >= 0.0 [1e-9]
Style	RC, RCR, RL, RLR, RN (R,C,N), RM, RN, RD, RZ, RB, RBR, RW, RWR, RE, RER, RTH, RT, RTR, RR, RA, RK, RP, RJ, RJR, RV, RQ, RVC
Quality	S, R, P, M, Non-Established, Commercial/Unknown
Ambient Temperature	x in R [°C]
Power Dissipation	x >= 0.0 [W]
Rated Power	x >= 0.0 [W]

## 1.2 Sensitivity

Complete - all parameters are used in all cases.

## 2 Capacitors

### 2.1 Parameters

Parameter	Value
Designator	C<Num>[<Char>] (e.g. C1A)
Description	Text
FIT	x >= 0.0 [1e-9]
Style	CP, CA, CZ, CQ, CH, CHR, CFR, CRH, CM, CMR, CB, CY, CYR, CK, CKR, CC, CDR, CSR, CWR, CL, CLR, CRL, CU, CE, CV, PC, CT, CG
Quality	D, C, S, B, R, P, M, L, Non-Established, Commercial/Unknown
Ambient Temperature	x in R [°C]
Capacitance	x >= 0.0 [ $\mu$ F]
Operating Voltage	x >= 0.0 [V]
Rated Voltage	x >= 0.0 [V]
Series Resistance	x >= 0.0 [ $\Omega$ ]

### 2.2 Sensitivity

Complete - all parameters are used in all cases.

## 3 Diodes

### 3.1 Parameters

Parameter	Value
Designator	D<Num>[<Char>] (e.g. D1A)
Description	Text
FIT	x >= 0.0 [1e-9]
Type	Diode, HF, Diode, LF
Style	<i>Depends on Type</i>
(Diode, HF)	Si IMPATT, Bulk Effect, Gunn, Tunnel, Back, Mixer, Detector, PIN, Schottky Barrier/Point Contact, Varactor, Step Recovery
(Diode, LF)	General Purpose Analog, Switching, Fast Recovery Power Rectifier, Power Rectifier/Schottky, Power Rectifier w/High Voltage Stacks, Transient Suppressor/Varistor, Current Regulator, Voltage Regulator/Reference
Quality	JANTXV, JANTX, JAN, Lower, Plastic
Ambient Temperature	x in R [°C]
Power	x >= 0.0 [W]
Thermal Resistance	x >= 0.0 [°C/W]
Junction Temperature	x >= 0.0 [°C]
Rated Power	x >= 0.0 [W]
Application	Varactor, Voltage Control, Varactor, Multiplier, Other
Voltage	x >= 0.0 [V]
Rated Voltage	x >= 0.0 [V]
Contact Construction	Metallurgically Bonded, Other
Stacks	x >= 0

### 3.2 Sensitivity



Type	Sensitivity
Diode, HF	((Power and Thermal Resistance) or Junction Temperature), Rated Power, Application
Diode, LF	((Power and Thermal Resistance) or Junction Temperature), Voltage, Rated Voltage, Contact Construction, Stacks



## 4 Inductors

### 4.1 Parameters

Parameter	Value
Designator	(L T)<Num>[<Char>] (e.g. L1A, T10B)
Description	Text
FIT	$x \geq 0.0$ [1e-9]
Type	Coil, Transformer
Style	<i>Depends on Type</i>
(Coil)	Fixed/Choke, Variable
(Transformer)	Flyback, Audio, Low Power, High Power, RF
Quality	<i>Depends on Type</i>
(Coil)	S, R, P, M, MIL-SPEC, Lower
(Transformer)	MIL-SPEC, Lower
Ambient Temperature	$x$ in R [°C]
Power Loss	$x \geq 0.0$ [W]
Weight	$x \geq 0.0$ [lbs]
Area	$x \geq 0.0$ [in <sup>2</sup> ]

### 4.2 Sensitivity

Type	Sensitivity
Coil	Power Loss, Area
Transformer	Power Loss, Weight

# 5 Transistors

## 5.1 Parameters

Parameter	Value
Designator	Q<Num>[<Char>] (e.g. Q1A)
Description	Text
FIT	x >= 0.0 [1e-9]
Type	Transistor, LF Bipolar, Transistor, LF FET, Transistor, Unijunction, Transistor, Low-Noise LF Bipolar, Transistor, High-Power HF Bipolar, Transistor, HF GaAs FET, Transistor, HF Si FET
Style	<i>Depends on Type</i>
(Transistor, LF Bipolar)	All
(Transistor, LF FET)	MOSFET, JFET
(Transistor, Unijunction)	All
(Transistor, Low-Noise LF Bipolar)	All
(Transistor, High-Power HF Bipolar)	All
(Transistor, HF GaAs FET)	All
(Transistor, HF Si FET)	MOSFET, JFET
Quality	<i>Depends on Type</i>
(Transistor, LF Bipolar)	JANTXV, JANTX, JAN, Lower, Plastic
(Transistor, LF FET)	JANTXV, JANTX, JAN, Lower, Plastic
(Transistor, Unijunction)	JANTXV, JANTX, JAN, Lower, Plastic
(Transistor, Low-Noise LF Bipolar)	JANTXV, JANTX, JAN, Lower
(Transistor, High-Power HF Bipolar)	JANTXV, JANTX, JAN, Lower
(Transistor, HF GaAs FET)	JANTXV, JANTX, JAN, Lower
(Transistor, HF Si FET)	JANTXV, JANTX, JAN, Lower
Ambient Temperature	x in R [°C]
Power	x >= 0.0 [W]
Thermal Resistance	x >= 0.0 [°C/W]
Junction Temperature	x >= 0.0 [°C]
Application	<i>Depends on Type</i>
(Transistor, LF Bipolar)	Linear Amplification, Switching
(Transistor, LF FET)	Linear Amplification, Switching, Power FET
(Transistor, Unijunction)	<i>None</i>
(Transistor, Low-Noise LF Bipolar)	<i>None</i>
(Transistor, High-Power HF Bipolar)	CW, Pulsed

Parameter	Value
(Transistor, HF GaAs FET)	CW, All Low-Power and Pulsed
(Transistor, HF Si FET)	None
Rated Power	$x \geq 0.0$ [W]
Vce	$x \geq 0.0$ [V]
Vceo	$x \geq 0.0$ [V]
Matching	In/Out, Input, None
Metallization	Gold, Aluminium
Frequency	$x \geq 0.0$ [Hz]
Duty	$0.0 \leq x \leq 1.0$
B Vces	$x \geq 0.0$ [V]

## 5.2 Sensitivity

Type	Sensitivity
Transistor, LF Bipolar	((Power and Thermal Resistance) or Junction Temperature), Application, Rated Power, Vce, Vceo
Transistor, LF FET	((Power and Thermal Resistance) or Junction Temperature), Application, Rated Power
Transistor, Unijunction	((Power and Thermal Resistance) or Junction Temperature)
Transistor, Low-Noise LF Bipolar	((Power and Thermal Resistance) or Junction Temperature), Vce, Vceo
Transistor, High-Power HF Bipolar	((Power and Thermal Resistance) or Junction Temperature), Power, Application, Matching, Metallization, Frequency, Vce, B Vces
Transistor, HF GaAs FET	((Power and Thermal Resistance) or Junction Temperature), Power, Application, Matching, Frequency
Transistor, HF Si FET	((Power and Thermal Resistance) or Junction Temperature)

## 6 Optoelectronics

### 6.1 Parameters

Parameter	Value
Designator	(DL LED LD PHD LDR OPTIC) <Num> [<Char>] (e.g. DL1A)
Description	Text
FIT	$x \geq 0.0 [1e-9]$
Type	Opto, Photodetector/Optoisolator, Opto, AlphaNumeric Display, Opto, Laser
Style	<i>Depends on Type</i>
(Opto, Photodetector/Optoisolator)	Photo-Transistor, Photo-Diode, Photodiode, Single, Phototransistor, Single, Photodarlington, Single, Light Sensitive Resistor, Single, Photodiode, Dual, Phototransistor, Dual, Photodarlington, Dual, Light Sensitive Resistor, Dual, IRLD, LED
(Opto, AlphaNumeric Display)	Segment, Diode Arra
(Opto, Laser)	GaAs/Al GaAs, In GaAs/In GaAsP
Quality	<i>Depends on Type</i>
(Opto, Photodetector/Optoisolator)	JANTXV, JANTX, JAN, Lower, Plastic
(Opto, AlphaNumeric Display)	JANTXV, JANTX, JAN, Lower, Plastic
(Opto, Laser)	Hermetic Package, Nonhermetic, Facet Coating, Nonhermetic
Ambient Temperature	$x \text{ in } R [^{\circ}C]$
Junction Temperature	$x \geq 0.0 [^{\circ}C]$
Logic Chip	Yes, No
Char Number	$x \geq 0$
Forward Current	$x \geq 0.0 [A]$
Application	CW, Pulsed
Duty	$0.0 \leq x \leq 1.0$
Rated Optical Power	$x \geq 0.0 [W]$
Required Optical Power	$x \geq 0.0 [W]$

### 6.2 Sensitivity

Type	Sensitivity
(Opto, Photodetector/Optoisolator)	Junction Temperature
(Opto, AlphaNumeric Display)	Junction Temperature, Logic Chip, Char Number
(Opto, Laser)	Junction Temperature, Forward Current, Application, Duty, Rated Optical Power, Required Optical Power



## 7 Switches

### 7.1 Parameters

Parameter	Value
Designator	(S SW MCB)<Num>[<Char>] (e.g. SW1A)
Description	Text
FIT	x >= 0.0 [1e-9]
Type	Switch, Circuit Breaker
Style (Switch)	<i>Depends on Type</i> Centrifugal, Dual-In-line, Limit, Liquid Level, Microwave, Pressure, Pushbutton, Reed, Rocker, Rotary, Sensitive, Thermal, Thumbwheel, Toggle
(Circuit Breaker)	Magnetic, Thermal, Thermal-Magnetic
Quality	MIL-SPEC, Lower
Ambient Temperature	x in R [°C]
Load	Resistive, Inductive, Lamp
Operating Load Current	x >= 0.0 [A]
Rated Resistive Load Current	x >= 0.0 [A]
Contact Number	x >= 0
Config	SPST, DPST, 3PST, 4PST
Use	Not Power On/Off Sw, Also Power On/Off Sw

### 7.2 Sensitivity

Type	Sensitivity
(Switch)	Load, Operating Load Current, Rated Resistive Load Current, Contact Number
(Circuit Breaker)	Config, Use

## 8 Microcircuits

### 8.1 Parameters

Parameter	Value
Designator	(IC U)<Num>[<Char>] (e.g. U1A)
Description	Text
FIT	x >= 0.0 [1e-9]
Type	Microcircuit, Logic Array and Microprocessor, Microcircuit, Memory, Microcircuit, VHSI/VLSI, Microcircuit, GaAs MMIC and Digital, Microcircuit, SAW, Microcircuit, Magnetic Bubble Memory
Style	<i>Depends on Type</i>
(Microcircuit, Logic Array and Microprocessor)	Bipolar - Digital, Bipolar - Linear, Bipolar - PLA/PLA, MOS - Digital, MOS - Linear, MOS - PLA/PAL, Microprocessor - Bipolar, Microprocessor - MOS
(Microcircuit, Memory)	MOS - ROM, MOS - PROM, MOS - UVEPROM, MOS - EEPROM, MOS - EAPROM, MOS - DRAM, MOS - SRAM, BiMOS - SRAM, Bipolar - ROM, Bipolar - PROM, Bipolar - SRAM
(Microcircuit, VHSI/VLSI)	Logic and Custom, Gate Array and Memory
(Microcircuit, GaAs MMIC and Digital)	MMIC, Digital
(Microcircuit, SAW)	All
(Microcircuit, Magnetic Bubble Memory)	Seed Bubble Generator, No Seed Bubble Generator
Quality	<i>Depends on Type</i>
(Microcircuit, Logic Array and Microprocessor)	Class S, Class B, Class B1, Custom, Commercial
(Microcircuit, Memory)	Class S, Class B, Class B1, Custom, Commercial
(Microcircuit, VHSI/VLSI)	Class S, Class B, Class B1, Custom, Commercial
(Microcircuit, GaAs MMIC and Digital)	Class S, Class B, Class B1, Custom, Commercial
(Microcircuit, SAW)	10 Temperature Cycles with Tests, Commercial



Parameter	Value
(Microcircuit, Magnetic Bubble Memory)	Class S, Class B, Class B1, Custom, Commercial
Ambient Temperature	$x \text{ in } R [^{\circ}C]$
Element Number	$x \geq 0$
Bit Number	$x \geq 0$ [bits]
Case Temperature	$x \geq 0.0 [^{\circ}C]$
Thermal Resistance	$x \geq 0.0 [^{\circ}C/W]$
Power	$x \geq 0.0 [W]$
Pin Number	$x \geq 0$
Package	<i>Depends on Type</i>
(Microcircuit, Logic Array and Microprocessor)	Hermetic - DIPs w/Solder, Hermetic - Weld Seal, Hermetic - PGA, Hermetic - SMT Leaded, Hermetic - SMT Non-Leaded, DIPs w/Glass Seal, Flatpacks w/Axial Leads, Cans, Non-Hermetic DIPs, Non-Hermetic PGA, Non-Hermetic SMT
(Microcircuit, Memory)	Hermetic - DIPs w/Solder, Hermetic - Weld Seal, Hermetic - PGA, Hermetic - SMT Leaded, Hermetic - SMT Non-Leaded, DIPs w/Glass Seal, Flatpacks w/Axial Leads, Cans, Non-Hermetic DIPs, Non-Hermetic PGA, Non-Hermetic SMT
(Microcircuit, VHSI/VLSI)	Hermetic - DIP, Hermetic - PGA, Hermetic - Chip Carrier, Non-Hermetic - DIP, Non-Hermetic - PGA, Non-Hermetic - Chip Carrier
(Microcircuit, GaAs MMIC and Digital)	Hermetic - DIPs w/Solder, Hermetic - Weld Seal, Hermetic - PGA, Hermetic - SMT Leaded, Hermetic - SMT Non-Leaded, DIPs w/Glass Seal, Flatpacks w/Axial Leads, Cans, Non-Hermetic DIPs, Non-Hermetic PGA, Non-Hermetic SMT
(Microcircuit, SAW)	<i>None</i>
(Microcircuit, Magnetic Bubble Memory)	Hermetic - DIPs w/Solder, Hermetic - Weld Seal, Hermetic - PGA, Hermetic - SMT Leaded, Hermetic - SMT Non-Leaded, DIPs w/Glass Seal, Flatpacks w/Axial Leads, Cans, Non-Hermetic DIPs, Non-Hermetic PGA, Non-Hermetic SMT
Years In Production	$x \geq 0.0$ [years]
Point Valuation	$x \geq 0$
Memory Size	$x \geq 0$ [bits]
Programming Cycles	$x \geq 0$

Parameter	Value
Technology	Bipolar: TTL, Bipolar: STTL, Bipolar: ASTTL, Bipolar: CML, Bipolar: HTTL, Bipolar: FTTL, Bipolar: DTL, Bipolar: ECL, BiCMOS, Bipolar: LSTTL, Bipolar: LTTL, Bipolar: ALSTTL, Bipolar: IIL, Bipolar: ISL, Digital: MOS, VHSIC: MOS, Linear: Bipolar, Linear: MOS, Memories: Bipolar, Memories: MOS, MNOS, GaAs: MMIC, GaAs: Digital
Mem Technology	Flotox, Textured Poly, None
Ecc	None, On-Chip Hamming, Two-Needs-One Redundant
Manufacturing	QML/QPL, Other
Die Area	$x \geq 0.0$ [cm <sup>2</sup> ]
Feature Size	$x \geq 0.0$ [um]
Esd Susceptibility	$x \geq 0.0$ [V]
Application	MMIC Low-Noise Low-Power, MMIC Driver High-Power, MMIC Unknown, Digital
Bubble Chip Number	$x \geq 0$
Dissipating Element Number	$x \geq 0$
Data Rate Avg	$x \geq 0.0$ [bytes/s]
Data Rate Max	$x \geq 0.0$ [bytes/s]
Read Per Write Number	$x \geq 0$

## 8.2 Sensitivity

Type	Sensitivity
Microcircuit, Logic Array and Microprocessor	Element Number, Bit Number, Case Temperature, Thermal Resistance, Power, Pin Number, Package, Years In Production, Point Valuation, Technology
Microcircuit, Memory	Memory Size, Programming Cycles, Memory Technology, Ecc, Case Temperature, Thermal Resistance, Power, Pin Number, Package, Years In Production, Point Valuation
Microcircuit, VHSI/VLSI	Manufacturing, Die Area, Feature Size, Pin Number, Package, Esd Susceptibility, Case Temperature, Thermal Resistance, Power, Point Valuation

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Type	Sensitivity
Microcircuit, GaAs MMIC and Digital	Element Number, Application, Case Temperature, Thermal Resistance, Power, Pin Number, Package, Years In Production, Point Valuation
Microcircuit, SAW	<i>None</i>
Microcircuit, Magnetic Bubble Memory	Bubble Chip Number, Dissipating Element Number, Bit Number, Data Rate Avg, Data Rate Max, Read Per Write Number, Case Temperature, Pin Number, Package, Years In Production, Point Valuation

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## 9 Thyristors/SCRs

### 9.1 Parameters

Parameter	Value
Designator	(THY SCR)<Num>[<Char>] (e.g. THY1A)
Description	Text
FIT	x >= 0.0 [1e-9]
Style	All
Quality	JANTXV, JANTX, JAN, Lower, Plastic
Ambient Temperature	x in R [°C]
Junction Temperature	x >= 0.0 [°C]
Rms Forward Current	x >= 0.0 [A]
Applied Blocking Voltage	x >= 0.0 [V]
Rated Blocking Voltage	x >= 0.0 [V]

### 9.2 Sensitivity

Complete - all parameters are used in all cases.

# 10 Connectors

## 10.1 Parameters

Parameter	Value
Designator	(X XZ)<Num>[<Char>] (e.g. X1A)
Description	Text
FIT	x >= 0.0 [1e-9]
Type	Connector, General, Connector, Socket
Style (Connector, General)	<i>Depends on Type</i> Circular/Cylindrical, Card Edge (PCB), Hexagonal, Rack and Panel, Rectangular, RF Coaxial, Telephone, Power, Triaxial
(Connector, Socket)	Dual-In-Line Package, Single-In-Line Package, Chip Carrier, Pin Grid Array, Relay, Transistor, Electron Tube, CRT
Quality	MIL-SPEC, Lower
Ambient Temperature	x in R [°C]
Contact Gauge	32 Gauge, 30 Gauge, 28 Gauge, 24 Gauge, 22 Gauge, 20 Gauge, 18 Gauge, 16 Gauge, 12 Gauge, RF Coaxial, RF Coaxial HP
Mating Cycles	x >= 0.0 [cycles/1k hour]
Amps Per Contact	x >= 0.0 [A]
Active Pins	x >= 0

## 10.2 Sensitivity

Type	Sensitivity
(Connector, General)	Contact Gauge, Mating Cycles, Amps Per Contact
(Connector, Socket)	Active Pins

# 11 Connections

## 11.1 Parameters

Parameter	Value
Designator	CN<Num>[<Char>] (e.g. CN1A)
Description	Text
FIT	$x \geq 0.0 [1e-9]$
Style	Hand Solder w/o Wrapping, Hand Solder, w/Wrapping, Crimp, Weld, Solderless Wrap, Clip Termination, Reflow Solder, Spring Contact, Terminal Block
Ambient Temperature	$x$ in R [°C]

## 11.2 Sensitivity

Complete - all parameters are used in all cases.

# 12 Rotating Devices

## 12.1 Parameters

Parameter	Value
Designator	(MO ROT)<Num>[<Char>] (e.g. ROT1A)
Description	Text
FIT	$x \geq 0.0 [1e-9]$
Type	Rotating, Motor, Rotating, Synchro and Resolver, Rotating, Time Meter
Style	<i>Depends on Type</i>
(Rotating, Motor)	General, Sensor, Servo, Stepper
(Rotating, Synchro and Resolver)	Synchro, Resolver
(Rotating, Time Meter)	AC, Inverter Driver, Commutator DC
Ambient Temperature	$x \text{ in } R [^{\circ}C]$
Design Life	$x \geq 0.0 [\text{hours}]$
Frame Temperature	$x \geq 0.0 [^{\circ}C]$
Size	$x \geq 0$
Brush Number	$x \geq 0$
Operating Temp	$x \geq 0.0 [^{\circ}C]$
Rated Temp	$x \geq 0.0 [^{\circ}C]$

## 12.2 Sensitivity

Type	Sensitivity
Rotating, Motor	Design Life
Rotating, Synchro and Resolver	Frame Temperature, Size, Brush Number
Rotating, Time Meter	Operating Temp, Rated Temp

# 13 Relays

## 13.1 Parameters

Parameter	Value
Designator	(K RLY RLA) <Num> [<Char>] (e.g. RLY1A)
Description	Text
FIT	x >= 0.0 [1e-9]
Type	Relay, Mechanical, Relay, Solid State and Time Delay
Style	<i>Depends on Type</i>
(Relay, Mechanical)	All
(Relay, Solid State and Time Delay)	Solid State, Solid State Time Delay, Hybrid
Quality	
(Relay, Mechanical)	R, P, X, U, M, L, MIL-SPEC, Commercial
(Relay, Solid State and Time Delay)	MIL-SPEC, Commercial
Ambient Temperature	x in R [°C]
Operating Current	x >= 0.0 [A]
Rated Current	x >= 0.0 [A]
Max Operating Temp	x >= 0.0 [°C]
Cycles Hours	x >= 0.0 []
Load	Resistive, Inductive, Lamp
Contact	SPST, DPST, SPDT, 3PST, 4PST, DPDT, 3PDT, 4PDT, 6PDT



Parameter	Value
Application	Signal Current - DryCircuit - Armature Long, Signal Current - DryCircuit - DryReed, Signal Current - DryCircuit - Mercury Wetted, Signal Current - DryCircuit - MagneticLatching, Signal Current - DryCircuit - BalancedArmature, Signal Current - DryCircuit - Solenoid, 0-5 Amp - General Purpose - Armature Long, 0-5 Amp - General Purpose - Balanced Armature, 0-5 Amp - General Purpose - Solenoid, 0-5 Amp - Sensitive - Armature Long Short, 0-5 Amp - Sensitive - Mercury Wetted, 0-5 Amp - Sensitive - Magnetic Latching, 0-5 Amp - Sensitive - MeterMovement, 0-5 Amp - Sensitive - BalancedArmature, 0-5 Amp - Polarized - Armature Short, 0-5 Amp - Polarized - MeterMovement, 0-5 Amp - Vibrating - Reed DryReed, 0-5 Amp - Vibrating - Reed Mercury Wetted, 0-5 Amp - HighSpeed - Armature BalancedShort, 0-5 Amp - HighSpeed - DryReed, 0-5 Amp - Thermal Time Delay - Bimetal, 0-5 Amp - Electronic Time Delay - NonThermal, 0-5 Amp - Latching, Magnetic - DryReed, 0-5 Amp - Latching, Magnetic - Mercury Wetted, 0-5 Amp - Latching, Magnetic - BalancedArmature, 5-20 Amp - High Voltage - Vacuum Glass, 5-20 Amp - High Voltage - Vacuum Ceramic, 5-20 Amp - Medium Power - Armature LongShort, 5-20 Amp - Medium Power - Mercury Wetted, 5-20 Amp - Medium Power - Magnetic Latching, 5-20 Amp - Medium Power - Mechanical Latching, 5-20 Amp - Medium Power - Balanced Armature, 5-20 Amp - Medium Power - Solenoid, Contactors - Armature Short, Contactors - Mechanical Latching, Contactors - Balanced Armature, Contactors - Solenoid

## 13.2 Sensitivity

Type	Sensitivity
Relay, Mechanical	Operating Current, Rated Current, Max Operating Temp, Cycles Hours, Load, Contact, Application
Relay, Solid State and Time Delay	<i>None</i>



# 14 Lasers

## 14.1 Parameters

Parameter	Value
Designator	LSR<Num>[<Char>] (e.g. LSR1A)
Description	Text
FIT	x >= 0.0 [1e-9]
Type	Laser, Helium And Argon, Laser, Carbon Dioxide, Sealed, Laser, Carbon Dioxide, Flowing, Laser, Solid State, ND:YAG and Ruby Rod
Ambient Temperature	x in R [°C]
Media	
(Laser, Helium And Argon)	He/Ne, He/Cd, Argon
(Laser, Carbon Dioxide, Sealed)	None
(Laser, Carbon Dioxide, Flowing)	None
(Laser, Solid State, ND:YAG and Ruby Rod)	ND:YAG, Ruby
Coupling	Helium, Argon
Tube Current	x >= 0.0 [mA]
C Overfill	0.0 <= x <= 100.0 [%]
Ballast Volumetric Increase	0.0 <= x <= 100.0 [%]
Active Optical Surfaces	1, 2
Power Output	x >= 0.0 [W]
Lamp	Xenon, Krypton
Pulse Rate	x >= 0.0 [Hz]
Energy Density	x >= 0.0 [J/cm <sup>2</sup> ]
Input Energy	x >= 0.0 [J]
Diameter	x >= 0.0 [mm]
Arc Length	x >= 0.0 [in]
Pulse Width	x >= 0.0 [μs]
Input Power	x >= 0.0 [kW]
Cooling	x >= 0
Coupling Cleanliness	Rigorous cleanliness, Minimal precautions, bellows provided, Minimal precautions, no bellows provided.

## 14.2 Sensitivity

Type	Sensitivity
Laser, Helium And Argon	Media, Coupling
Laser, Carbon Dioxide, Sealed	Tube Current, C Overfill, Ballast Volumetric Increase, Active Optical Surfaces
Laser, Carbon Dioxide, Flowing	Power Output, Active Optical Surfaces
Laser, Solid State, ND:YAG and Ruby Rod	Media, Lamp, Pulse Rate, Energy Density, Input Energy, Diameter, Arc Length, Pulse Width, Input Power, Cooling, Coupling Cleanliness, Active Optical Surfaces



# 15 Fuses

## 15.1 Parameters

Parameter	Value
Designator	(F FUUSE) <Num> [<Char>] (e.g. F1A)
Description	Text
FIT	$x \geq 0.0 [1e-9]$
Ambient Temperature	$x$ in R [°C]

## 15.2 Sensitivity

Only depends on global parameters.



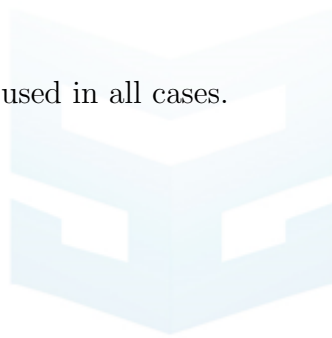
# 16 Crystals

## 16.1 Parameters

Parameter	Value
Designator	XTAL<Num>[<Char>] (e.g. XTAL1A)
Description	Text
FIT	$x \geq 0.0$ [1e-9]
Quality	MIL-SPEC, Lower
Ambient Temperature	$x$ in R [°C]
Frequency	$x \geq 0.0$ [MHz]

## 16.2 Sensitivity

Complete - all parameters are used in all cases.



# 17 Miscellaneous

## 17.1 Parameters

Parameter	Value
Designator	MISC<Num>[<Char>] (e.g. MISC1A)
Description	Text
FIT	$x \geq 0.0 [1e-9]$
Style	Vibrators - 60 Cycles, Vibrators - 120 Cycles, Vibrators - 400 Cycles, Neon Lamps, Fiber Optic Cables, Single Fiber Optic Connectors, MicrowaveElements - Attenuators, MicrowaveElements - Fixed Elements, MicrowaveElements - Variable Elements, Microwave Ferrite Devices - Isolators and Circulators ( $\leq 100W$ ), Microwave Ferrite Devices - Isolators and Circulators ( $> 100W$ ), Microwave Ferrite Devices - Phase Shifter, Dummy Loads - $< 100W$ , Dummy Loads - $100W$ to $\leq 1000W$ , Dummy Loads - $> 1000W$ , Terminations - Stripline
Ambient Temperature	$x$ in R [ $^{\circ}C$ ]
Fiber Length	$x \geq 0.0 [km]$

## 17.2 Sensitivity

Complete - all parameters are used in all cases.

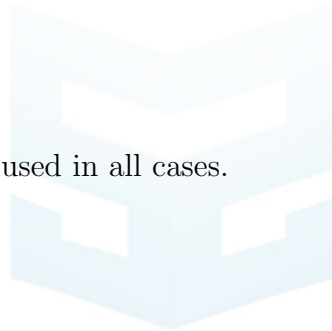
# 18 Filters

## 18.1 Parameters

Parameter	Value
Designator	FL<Num>[<Char>] (e.g. FL1A)
Description	Text
FIT	$x \geq 0.0 [1e-9]$
Style	Ceramic Ferrite, Discrete LC, Discrete LC (Composition 1), Discrete LC and Crystal
Quality	MIL-SPEC, Lower
Ambient Temperature	$x$ in R [ $^{\circ}$ C]

## 18.2 Sensitivity

Complete - all parameters are used in all cases.





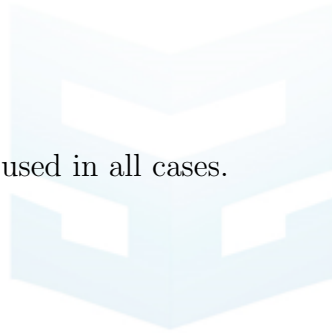
# 19 Lamps

## 19.1 Parameters

Parameter	Value
Designator	LAMP<Num>[<Char>] (e.g. LAMP1A)
Description	Text
FIT	$x \geq 0.0$ [1e-9]
Style	A11
Ambient Temperature	$x$ in R [°C]
Rated Voltage	$x \geq 0.0$ [V]
Application	AC, DC
Utilization	$0.0 \leq x \leq 100.0$

## 19.2 Sensitivity

Complete - all parameters are used in all cases.



## 20 Tubes

### 20.1 Parameters

Parameter	Value
Designator	V<Num>[<Char>] (e.g. V1A)
Description	Text
FIT	x >= 0.0 [1e-9]
Type	Tube, All Except TWT and Magnetron, Tube, Traveling Wave, Tube, Magnetron
Style	<i>Depends on Type</i>



Parameter	Value
(Tube, All Except TWT and Magnetron)	Receiver Triode Tetrode Pentode, Power Rectifier, CRT, Thyatron, CrossedFieldAmplifier QK681, CrossedFieldAmplifier SFD261, PulsedGridded 2041, PulsedGridded 6952, PulsedGridded 7835, Transmitting Triode, Transmitting Tetrode, Transmitting HighPower, Vidicon AntimonyTrisulfide, Vidicon SiliconDiode, Twystron VA144, Twystron VA145E, Twystron VA145H, Twystron VA913A, Klystron Pulsed 4KMP10000LF, Klystron Pulsed 8568, Klystron Pulsed L3035, Klystron Pulsed L3250, Klystron Pulsed L3403, Klystron Pulsed SAC42A, Klystron Pulsed VA842, Klystron Pulsed Z5010A, Klystron Pulsed ZM3038A, Klystron Pulsed Others, Klystron LowPower, Klystron CW 3K3000LQ, Klystron CW 3K500000LF, Klystron CW 3K210000LQ, Klystron CW 3KM300LA, Klystron CW 3KM3000LA, Klystron CW 3KM5000PA, Klystron CW 3KM5000PA1, Klystron CW 3KM5000PA2, Klystron CW 4K3CC, Klystron CW 4K3SK, Klystron CW 4K50000LQ, Klystron CW 4KM50LB, Klystron CW 4KM50LC, Klystron CW 4KM50SJ, Klystron CW 4KM50SK, Klystron CW 4KM3000LR, Klystron CW 4KM50000LQ, Klystron CW 4KM50000LR, Klystron CW 4KM170000LA, Klystron CW 8824, Klystron CW 8825, Klystron CW 8826, Klystron CW VA800E, Klystron CW VA853, Klystron CW VA856B, Klystron CW VA888E, Klystron CW Other
(Tube, Traveling Wave)	All
(Tube, Magnetron)	CW, Coaxial Pulsed, Conventional Pulsed
Ambient Temperature	x in R [°C]
Frequency	x >= 0.0 [T1: MHz, T2: GHz, T3: GHz] (*)
Power	x >= 0.0 [T1: kW, T2: W, T3: W] (*)
Years	x >= 0.0 [years]
Radiate Hours	0.0 <= x <= 1.0 (**)

\* Units depend on Type, where T1 is type 1 (Tube, All Except TWT and Magnetron), and so forth.

\*\* Refers to Utilization in the Standard.

## 20.2 Sensitivity

Type	Sensitivity
Tube, All Except TWT and Magnetron	Frequency, Power, Years
Tube, Traveling Wave	Frequency, Power
Tube, Magnetron	Frequency, Power, Radiate Hours



## 21 Intercon Asms

### 21.1 Parameters

Parameter	Value
Designator	(PTH SMT) <Num> [<Char>] (e.g. PTH1A)
Description	Text
FIT	$x \geq 0.0 [1e-9]$
Type	Intercon Asm, PTH, Intercon Asm, SMT
Style	<i>Depends on Type</i>
(Intercon Asm, PTH)	Printed Wiring/PCB with PTH, Discrete Wiring with Electroless Deposited PTH
(Intercon Asm, SMT)	All
Quality	<i>Depends on Type</i>
(Intercon Asm, PTH)	MIL-SPEC or Equivalent, Lower
(Intercon Asm, SMT)	All
Ambient Temperature	$x$ in R [°C]
Auto Soldered Number	$x \geq 0$
Hand Soldered Number	$x \geq 0$
Plane Number	$x \geq 0$
Equipment	Automotive, Consumer, Computer, Telecommunications, Commercial Aircraft, Industrial, Military Ground Applications, Military Aircraft (Cargo), Military Aircraft (Fighter)
Package	Plastic, Ceramic
Lead Cfg	Leadless, J/S Lead, Gull Wing

Parameter	Value
Substrate	FR-4 Laminate, FR-4 Multilayer Board, FR-4 Multilayer Board w/Copper Clad Invar, Ceramic Multilayer Board, Copper Clad Invar, Copper Clad Molybdenum, Carbon-Fiber/Epoxy Composite, Kevlar Fiber, Quartz Fiber, Glass Fiber, Epoxy/Glass Laminate, Polyamide/Glass Laminate, Polyamide/Kevlar Laminate, Polyamide/Quartz Laminate, Epoxy/Kevlar Laminate, Alumina, Epoxy Aramid Fiber, Polyamide Aramid Fiber, Epoxy-Quartz, Fiberglass Teflon Laminates, Porcelanized Copper Clad Invar, Fiberglass Ceramic Fiber
Design Life	x >= 0.0 [hours]
Distance	x >= 0.0 [mils]
Solder Height	x >= 0.0 [mils]
Thermal Resistance	x >= 0.0 [°C/W]
Power	x >= 0.0 [W]
Temp Diff	x >= 0.0 [°C]

## 21.2 Sensitivity

Type	Sensitivity
Intercon Asm, PTH	Auto Soldered Number, Hand Soldered Number, Plane Number
Intercon Asm, SMT	Equipment, Package, LeadCfg, Substrate, Design Life, Distance, Solder Height, Thermal Resistance, Power, Temp Diff

## 22 Meter Panels

### 22.1 Parameters

Parameter	Value
Designator	PANEL<Num>[<Char>] (e.g. PANEL1A)
Description	Text
FIT	$x \geq 0.0 [1e-9]$
Style	All
Quality	MIL-M-10304, Lower
Ambient Temperature	$x$ in R [ $^{\circ}$ C]
Application	DC, AC
Function	Ammeter, Voltmeter, Other

### 22.2 Sensitivity

Complete - all parameters are used in all cases.

