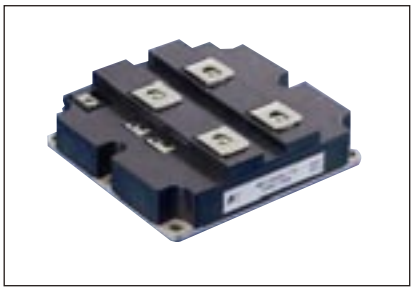
1MBI1600U4C-170

IGBT Modules

IGBT MODULE (U series)
1700V / 1600A / 1 in one package

Features

High speed switching
Voltage drive
Low Inductance module structure



Applications

Inverter for Motor Drive
AC and DC Servo Drive Amplifier
Uninterruptible Power Supply
Industrial machines, such as Welding machines

Maximum Ratings and Characteristics

● **Absolute Maximum Ratings (at Tc=25°C unless otherwise specified)**

Items	Symbols	Conditions		Maximum ratings	Units
Collector-Emitter voltage	V_{CES}			1700	V
Gate-Emitter voltage	V_{GES}			±20	V
Collector current	Ic	Continuous	Tc=25°C	2400	A
			Tc=80°C	1600	
	Ic pulse	1ms	Tc=25°C	4800	
			Tc=80°C	3200	
	-Ic			1600	
	-Ic pulse	1ms		3200	
Collector power dissipation	Pc	1 device		9760	W
Junction temperature	Tj			150	°C
Storage temperature	Tstg			-40 to +125	°C
Isolation voltage Between terminal and copper base (*1)	V_{iso}	AC : 1min.		3400	VAC
Screw torque	Mounting (*2)			5.75	N·m
	Main Terminals (*2)			10	
	Sense Terminals (*2)			2.5	

Note *1: All terminals should be connected together when isolation test will be done.
Note *2: Recommendable value : Mounting : 4.25-5.75 N·m (M6), Main Terminal : 8-10 N·m (M8), Sense Terminal : 1.7-2.5 N·m (M4)

● **Electrical characteristics (at Tj= 25°C unless otherwise specified)**

Items	Symbols	Conditions		Characteristics min.	Characteristics typ.	Characteristics max.	Units
Zero gate voltage collector current	I_{CES}	V_{GE} = 0V, V_{CE} = 1700V		-	-	1.0	mA
Gate-Emitter leakage current	I_{GES}	V_{CE} = 0V, V_{GE} = ±20V		-	-	3200	nA
Gate-Emitter threshold voltage	$V_{GE\ (th)}$	V_{CE} = 20V, I_C = 1600mA		5.5	6.5	7.5	V
Collector-Emitter saturation voltage	$V_{CE\ (sat)}$ (main terminal)	V_{GE} = 15V, I_C = 1600A	Tj=25°C	-	2.47	2.65	V
			Tj=125°C	-	2.87	-	
	$V_{CE\ (sat)}$ (chip)		Tj=25°C	-	2.25	2.40	
			Tj=125°C	-	2.65	-	
Input capacitance	Cies	V_{GE} = 0V, V_{CE} = 10V, f = 1MHz		-	150	-	nF
Turn-on time	ton	V_{CC} = 900V, I_C = 1600A, V_{GE} = ±15V, Tj = 125°C, R_{gon} = 2.7Ω, R_{goff} = 1Ω		-	1.80	-	μs
	tr			-	0.85	-	
Turn-off time	toff			-	1.30	-	
	tf			-	0.35	-	
Forward on voltage	V_F (main terminal)	V_{GE} = 0V, I_F = 1600A	Tj=25°C	-	2.02	2.40	V
			Tj=125°C	-	2.22	-	
	V_F (chip)		Tj=25°C	-	1.80	2.15	
			Tj=125°C	-	2.00	-	
Reverse recovery time	trr	I_F = 1600A		-	0.35	-	μs
Lead resistance, terminal-chip (*3)	R lead			-	0.134	-	mΩ

Note *3: Biggest internal terminal resistance among arm.

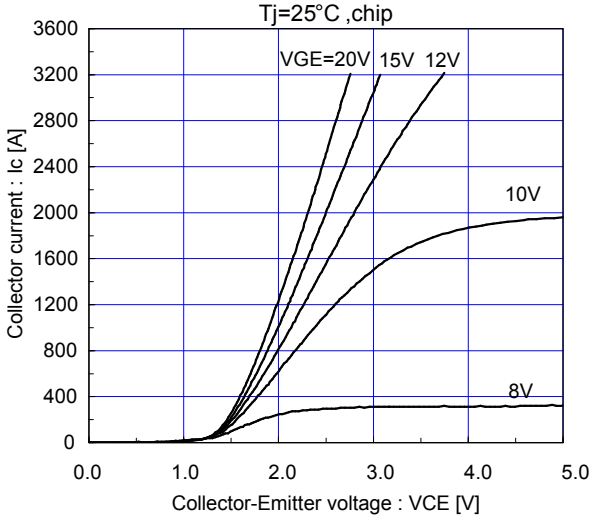
● **Thermal resistance characteristics**

Items	Symbols	Conditions	Characteristics min.	Characteristics typ.	Characteristics max.	Units
Thermal resistance (1device)	Rth(j-c)	IGBT	-	-	0.013	°C/W
		FWD	-	-	0.023	
Contact thermal resistance (1device)	Rth(c-f)	with Thermal Compound (*4)	-	0.006	-	

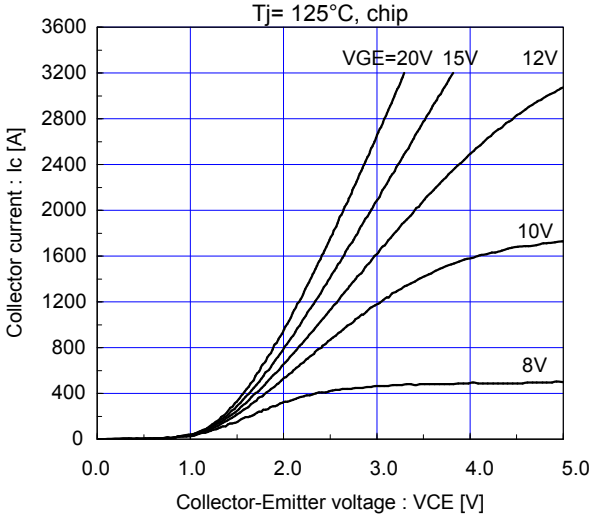
Note *4: This is the value which is defined mounting on the additional cooling fin with thermal compound.

Characteristics (Representative)

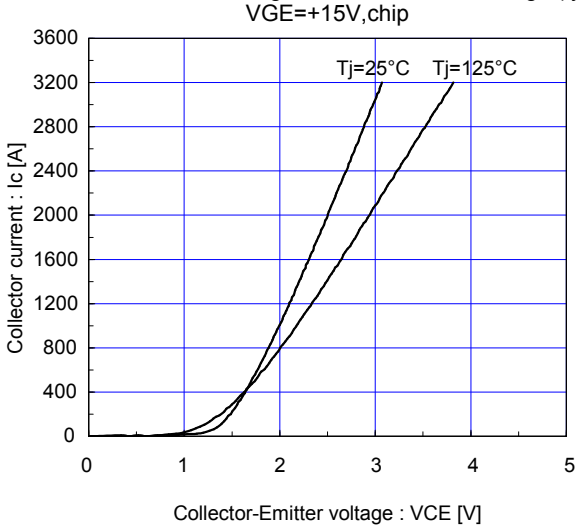
Collector current vs. Collector-Emitter voltage (typ.)
Tj=25°C ,chip



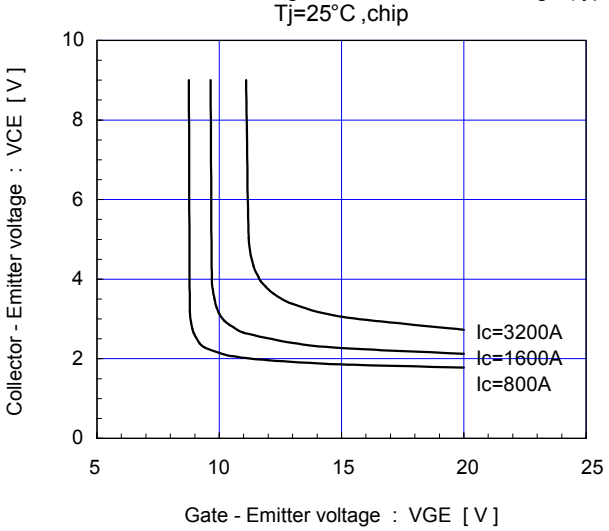
Collector current vs. Collector-Emitter voltage (typ.)
Tj= 125°C, chip



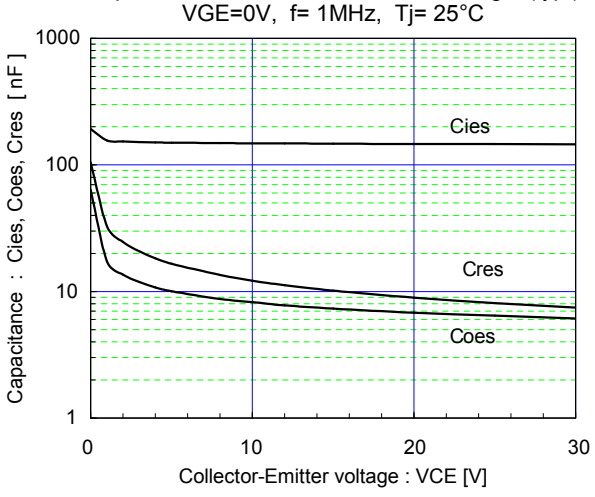
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.)
VGE=+15V,chip



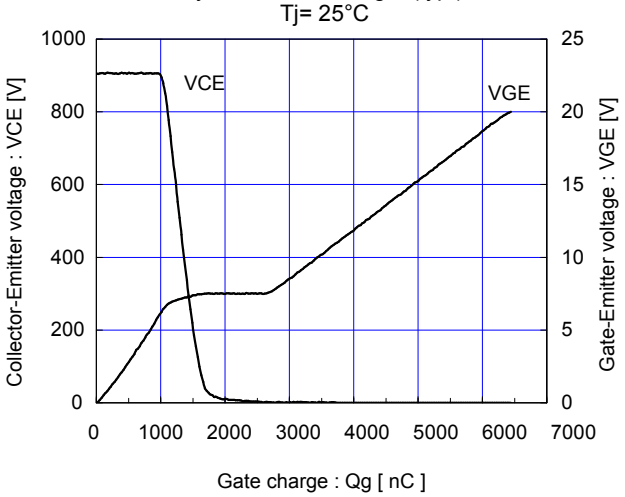
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.)
Tj=25°C ,chip



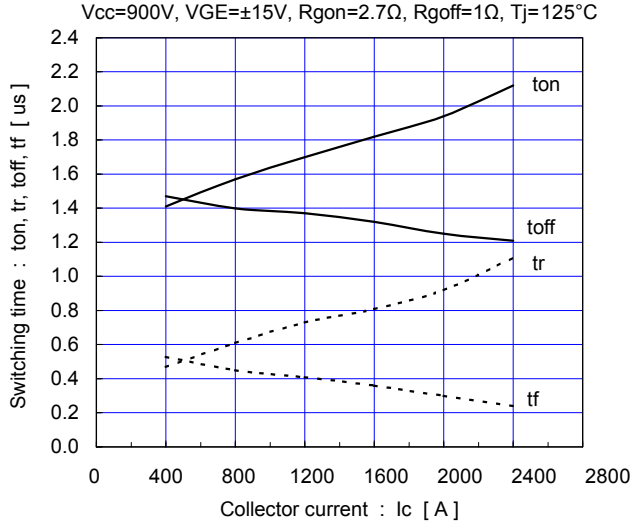
Capacitance vs. Collector-Emitter voltage (typ.)
VGE=0V, f= 1MHz, Tj= 25°C



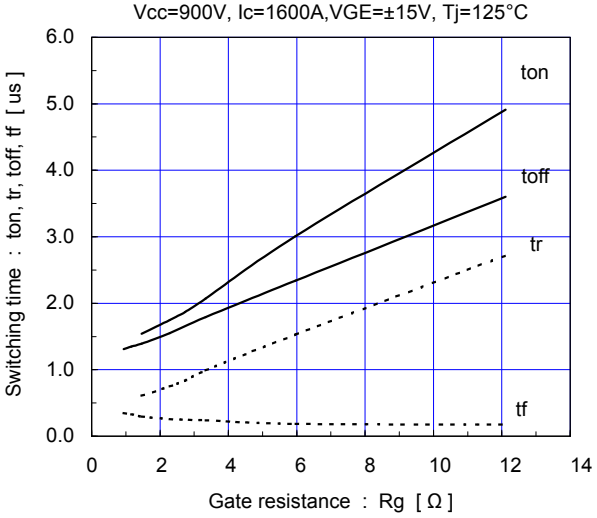
Dynamic Gate charge (typ.)
Tj= 25°C



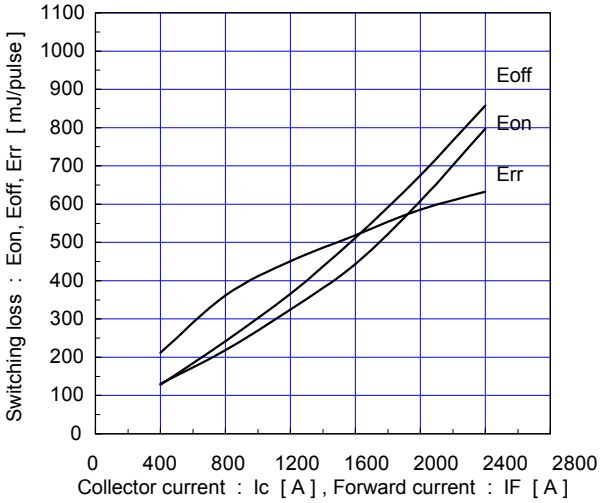
Switching time vs. Collector current (typ.)
Vcc=900V, VGE=±15V, Rgon=2.7Ω, Rgoff=1Ω, Tj=125°C



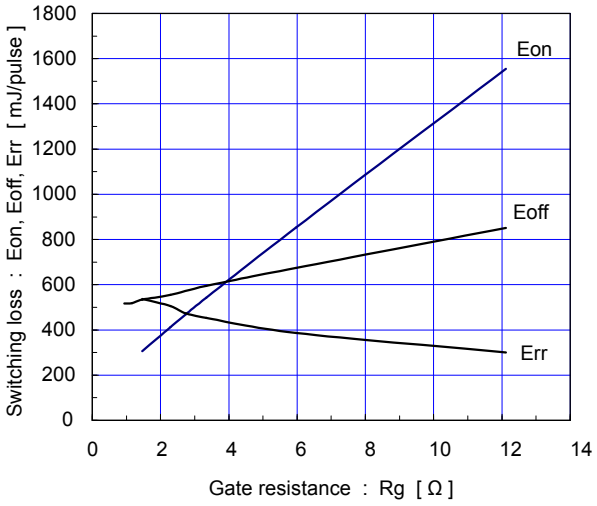
Switching time vs. Gate resistance (typ.)
Vcc=900V, Ic=1600A,VGE=±15V, Tj=125°C



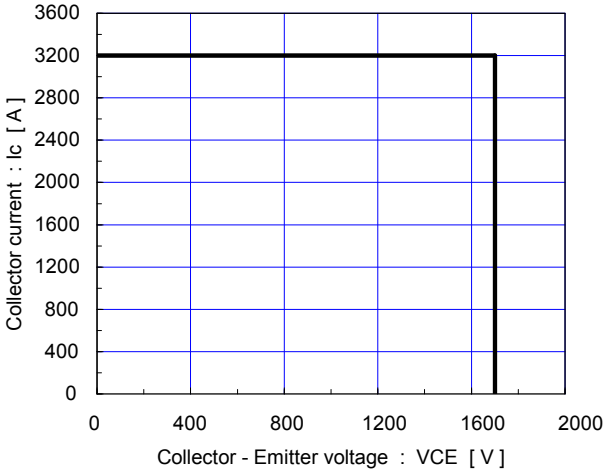
Switching loss vs. Collector current (typ.)
Vcc=900V, VGE=±15V, Rgon=2.7Ω, Rgoff=1Ω, Tj=125°C

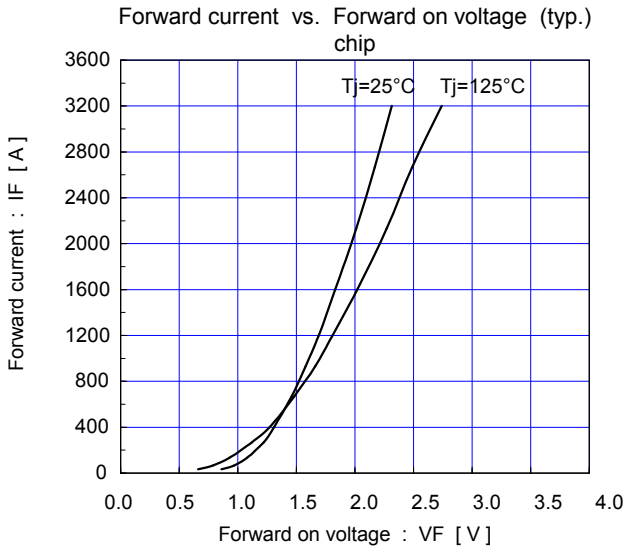


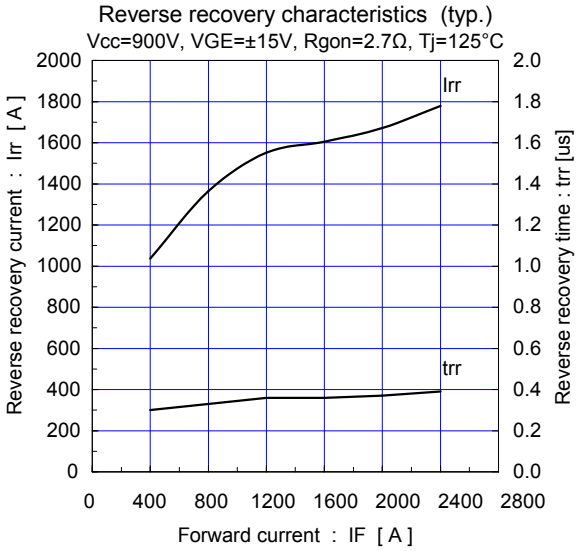
Switching loss vs. Gate resistance (typ.)
Vcc=900V, Ic=1600A,VGE=±15V, Tj=125°C

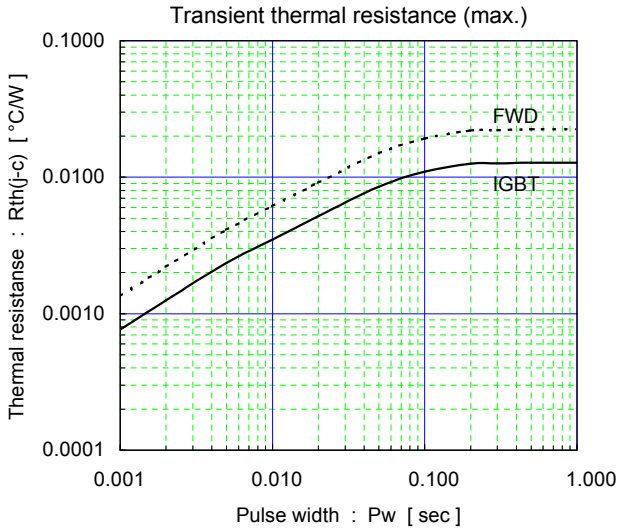


Reverse bias safe operating area (max.)
± VGE=15V ,Tj = 125°C / chip

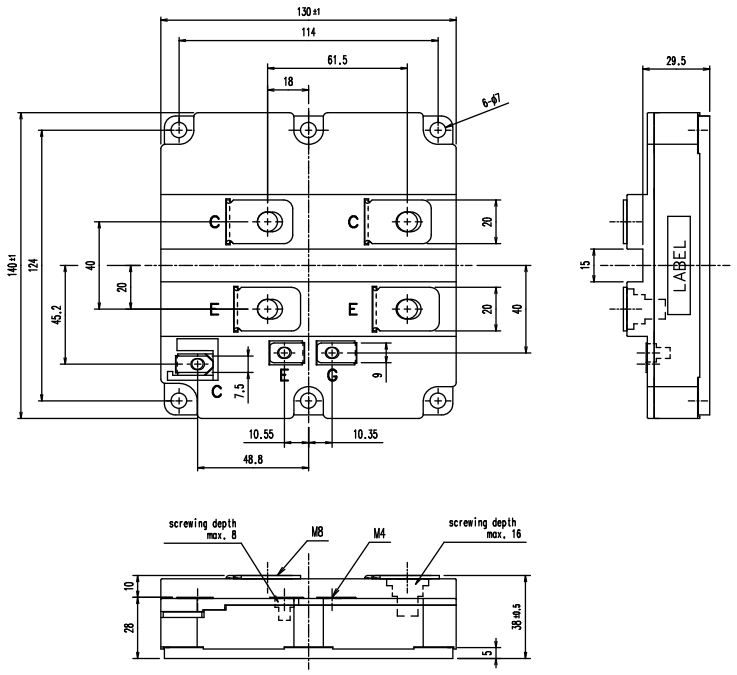



Forward current vs. Forward on voltage (typ.)
chip
Tj=25°C
Tj=125°C
Forward current : IF [A]
Forward on voltage : VF [V]
3600
3200
2800
2400
2000
1600
1200
800
400
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0

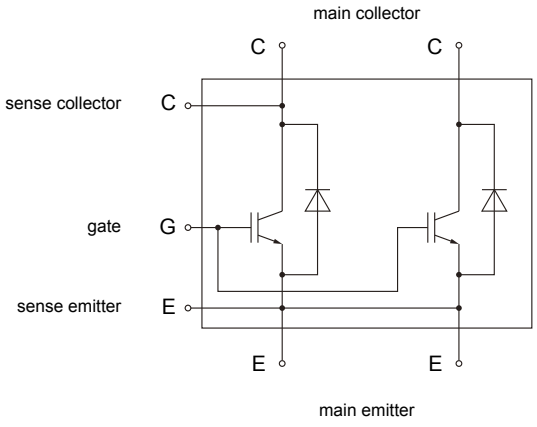

Reverse recovery characteristics (typ.)
Vcc=900V, VGE=±15V, Rgon=2.7Ω, Tj=125°C
Irr
trr
Reverse recovery current : Irr [A]
Reverse recovery time : trr [us]
Forward current : IF [A]
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
400
800
1200
1600
2000
2400
2800


Transient thermal resistance (max.)
FWD
IGBT
Thermal resistanse : Rth(j-c) [°C/W]
Pulse width : Pw [sec]
0.1000
0.0100
0.0010
0.0001
0.001
0.010
0.100
1.000

Outline Drawings, mm



Equivalent Circuit Schematic



WARNING

1. This Catalog contains the product specifications, characteristics, data, materials, and structures as of October 2008.
   The contents are subject to change without notice for specification changes or other reasons. When using a product listed in this Catalog, be sure to obtain the latest specifications.

2. All applications described in this Catalog exemplify the use of Fuji's products for your reference only. No right or license, either express or implied, under any patent, copyright, trade secret or other intellectual property right owned by Fuji Electric Device Technology Co., Ltd. is (or shall be deemed) granted. Fuji Electric Device Technology Co., Ltd. makes no representation or warranty, whether express or implied, relating to the infringement or alleged infringement of other's intellectual property rights which may arise from the use of the applications described herein.

3. Although Fuji Electric Device Technology Co., Ltd. is enhancing product quality and reliability, a small percentage of semiconductor products may become faulty. When using Fuji Electric semiconductor products in your equipment, you are requested to take adequate safety measures to prevent the equipment from causing a physical injury, fire, or other problem if any of the products become faulty. It is recommended to make your design fail-safe, flame retardant, and free of malfunction.

4. The products introduced in this Catalog are intended for use in the following electronic and electrical equipment which has normal reliability requirements.
   • Computers • OA equipment • Communications equipment (terminal devices) • Measurement equipment
   • Machine tools • Audiovisual equipment • Electrical home appliances • Personal equipment • Industrial robots etc.

5. If you need to use a product in this Catalog for equipment requiring higher reliability than normal, such as for the equipment listed below, it is imperative to contact Fuji Electric Device Technology Co., Ltd. to obtain prior approval. When using these products for such equipment, take adequate measures such as a backup system to prevent the equipment from malfunctioning even if a Fuji's product incorporated in the equipment becomes faulty.
   • Transportation equipment (mounted on cars and ships) • Trunk communications equipment
   • Traffic-signal control equipment • Gas leakage detectors with an auto-shut-off feature
   • Emergency equipment for responding to disasters and anti-burglary devices • Safety devices
   • Medical equipment

6. Do not use products in this Catalog for the equipment requiring strict reliability such as the following and equivalents to strategic equipment (without limitation).
   • Space equipment • Aeronautic equipment • Nuclear control equipment
   • Submarine repeater equipment

8. If you have any question about any portion in this Catalog, ask Fuji Electric Device Technology Co., Ltd. or its sales agents before using the product.
   Neither Fuji Electric Device Technology Co., Ltd. nor its agents shall be liable for any injury caused by any use of the products not in accordance with instructions set forth herein.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for fuji ***manufacturer:***

Other Similar products are found below :

BZ6WL30CU BZ6WR30CAU BZ6WL30CAU EW100AAG-3P100B EW50AAG-2P015B FMN-60 5V AH165-EG33 AH165-J3C33A AH165-SGLW11E3 AH165-TGL5W11E3 AHX511-L AHX662-A DR30D0L-E3A AR22E0L-10E4G AR22F0L-02H4R AR22G3R-01B AR22G4L-10E3W AR22G4L-11E3A AR22JCR-3A14DC AR22M0R-01B AR22PR-711B AR22S2R-22W AR22VGE-11R AR30E0L-10E3W AR30E0R-11G AR9T511-H EG52F/40-30MA BU-ECA2005L BW9BTAA-L3 BW9BTAA-S2 BW9FWCA-15A BZ6KL10CU 1TR0AK RT11-DC24V SA103RCUL/60 SA103RCUL/75 SA203CUL/125 SA203CUL/200 SA203RCUL/125 SA53RCUL/3 SC-E1-220VAC SC-E5-200V 2NC2F-CK SG103CUL/40-CO SK12LR-E01W AC09-CX0/11L1 EW125JAG-4P030K EW250JAGU-3P200K EW250JAGU-3P225K EW50RAGU-3P003K