

1200V / 5A

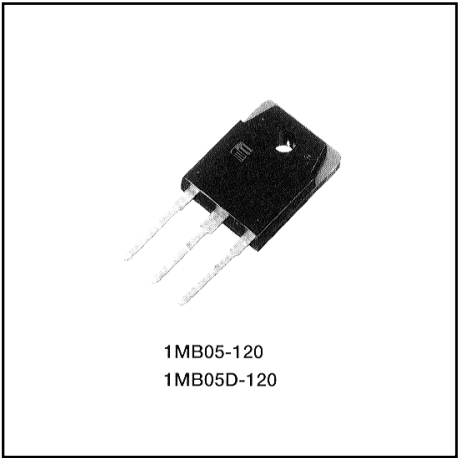
Molded Package

■ Features

- Small molded package
- Low power loss
- Soft switching with low switching surge and noise
- High reliability, high ruggedness (RBSOA, SCSOA etc.)
- Comprehensive line-up

■ Applications

- Inverter for Motor drive
- AC and DC Servo drive amplifier
- Uninterruptible power supply



■ Maximum ratings and characteristics

- Absolute maximum ratings (at $T_c=25^{\circ}\text{C}$ unless otherwise specified)

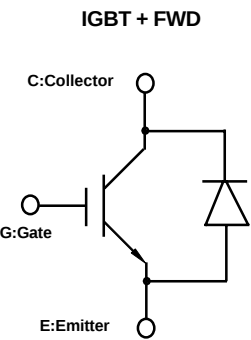
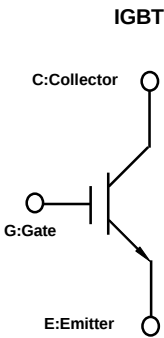
1MB05-120 / IGBT

Item			Symbol	Rating	Unit
Collector-Emitter voltage			V_{CES}	1200	V
Gate-Emitter voltage			V_{GES}	± 20	V
Collector current	DC	$T_c=25^{\circ}\text{C}$	I_{C25}	9	A
		$T_c=100^{\circ}\text{C}$	I_{C100}	5	A
	1ms	$T_c=25^{\circ}\text{C}$	I_{CP}	27	A
Max. power dissipation(IGBT)			P_C	100	W
Operating temperature			T_J	+150	$^{\circ}\text{C}$
Storage temperature			T_{stg}	-40 to +150	$^{\circ}\text{C}$
Screw torque			-	50	N·m

1MB05D-120 / IGBT+FWD

Item			Symbol	Rating	Unit
Collector-Emitter voltage			V_{CES}	1200	V
Gate-Emitter voltage			V_{GES}	± 20	V
Collector current	DC	$T_c=25^{\circ}\text{C}$	I_{C25}	9	A
		$T_c=100^{\circ}\text{C}$	I_{C100}	5	A
	1ms	$T_c=25^{\circ}\text{C}$	I_{CP}	27	A
Max. power dissipation (IGBT)			P_C	100	W
Max. power dissipation (FWD)			P_C	60	W
Operating temperature			T_J	+150	$^{\circ}\text{C}$
Storage temperature			T_{stg}	-40 to +150	$^{\circ}\text{C}$
Screw torque			-	50	N·m

■ Equivalent Circuit Schematic



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

1MB05-120 / IGBT

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Zero gate voltage collector current	I _{CEs}	—	—	1.0	V _{GE} =0V, V _{CE} =1200V	mA
Gate-Emitter leakage current	I _{GES}	—	—	20	V _{CE} =0V, V _{GE} =±20V	μA
Gate-Emitter threshold voltage	V _{GE(th)}	5.5	—	8.5	V _{CE} =20V, I _c =5mA	V
Collector-Emitter saturation voltage	V _{CE(sat)}	—	—	3.5	V _{GE} =15V, I _c =5A	V
Input capacitance	C _{ies}	—	650	—	V _{GE} =0V	pF
Output capacitance	C _{oes}	—	150	—	V _{CE} =10V	
Reverse transfer capacitance	C _{res}	—	40	—	f=1MHz	
Turn-on time	t _{on}	—	—	1.2	V _{CC} =600V I _c =5A	μs
	t _r	—	—	0.6	V _{GE} =±15V	
Turn-off time	t _{off}	—	—	1.5	R _G =330 ohm	
	t _f	—	—	0.5	(Half Bridge)	

1MB05D-120 / IGBT+FWD

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Zero gate voltage collector current	I _{CEs}	—	—	1.0	V _{GE} =0V, V _{CE} =1200V	mA
Gate-Emitter leakage current	I _{GES}	—	—	20	V _{CE} =0V, V _{GE} =±20V	μA
Gate-Emitter threshold voltage	V _{GE(th)}	5.5	—	8.5	V _{CE} =20V, I _c =5mA	V
Collector-Emitter saturation voltage	V _{CE(sat)}	—	—	3.5	V _{GE} =15V, I _c =5A	V
Input capacitance	C _{ies}	—	650	—	V _{GE} =0V	pF
Output capacitance	C _{oes}	—	150	—	V _{CE} =10V	
Reverse transfer capacitance	C _{res}	—	40	—	f=1MHz	
Turn-on time	t _{on}	—	—	1.2	V _{CC} =600V, I _c =5A	μs
	t _r	—	—	0.6	V _{GE} =±15V	
Turn-off time	t _{off}	—	—	1.5	R _G =330 ohm	
	t _f	—	—	0.5	(Half Bridge)	
FWD forward on voltage	V _F	—	—	3.0	I _F =5A, V _{GE} =0V	V
Reverse recovery time	t _{rr}	—	—	0.35	I _F =5A, V _{GE} =-10V, di/dt=100A/μs	μs

● Thermal resistance characteristics

1MB05-120 / IGBT

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Thermal resistance	R _{th(j-c)}	—	—	1.25	IGBT	°C/W

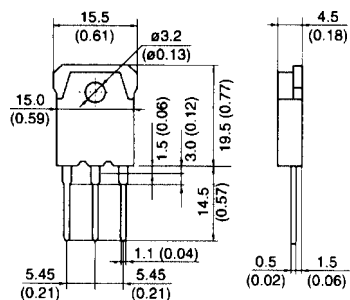
1MB05D-120 / IGBT+FWD

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Thermal resistance	R _{th(j-c)}	—	—	1.25	IGBT	°C/W
	R _{th(j-c)}	—	—	2.08	FWD	°C/W

■ Outline drawings, mm

1MB05-120, 1MB05D-120

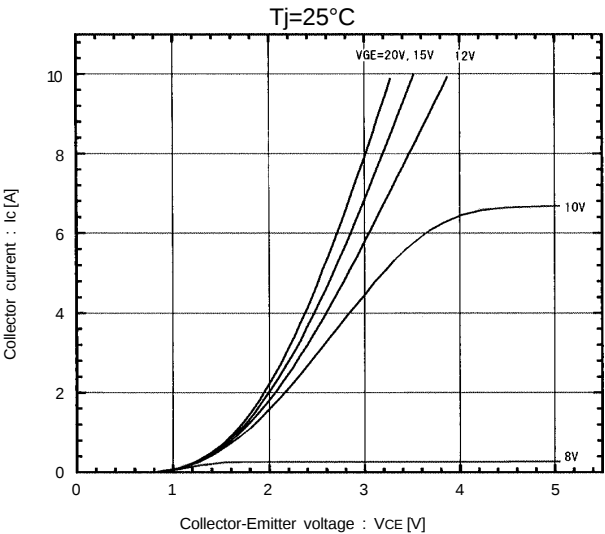
TO-3P



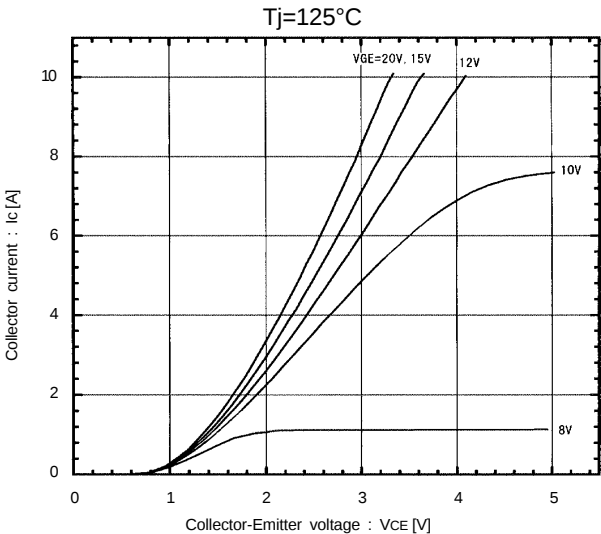
Characteristics

1MB05-120,1MB05D-120

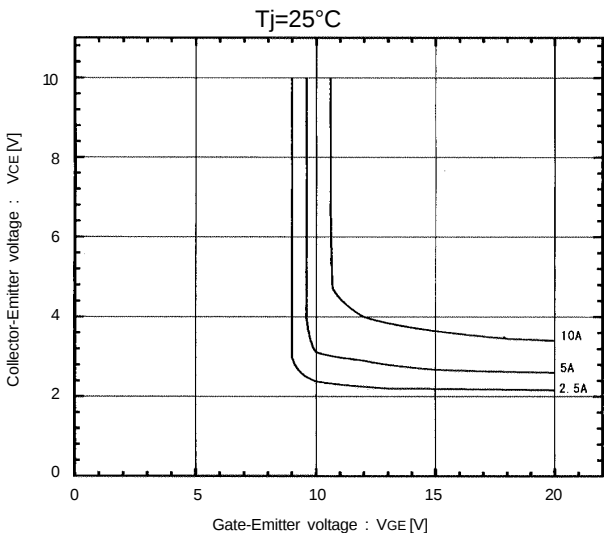
Collector current vs. Collector-Emitter voltage



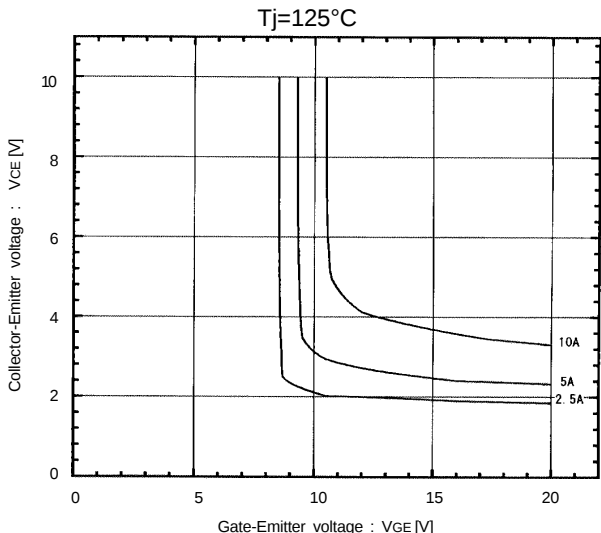
Collector current vs. Collector-Emitter voltage



Collector-Emitter vs. Gate-Emitter voltage

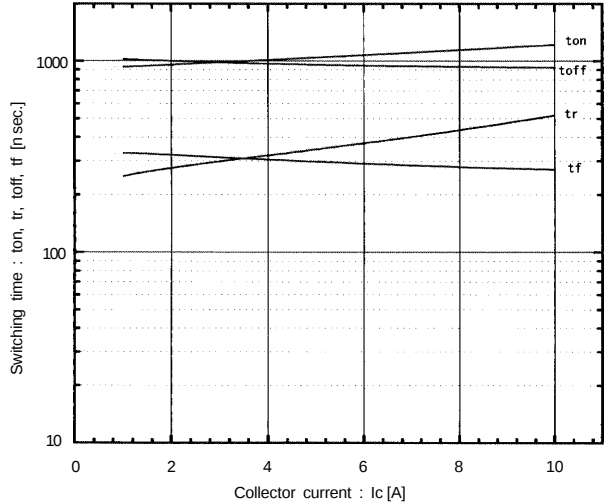


Collector-Emitter vs. Gate-Emitter voltage



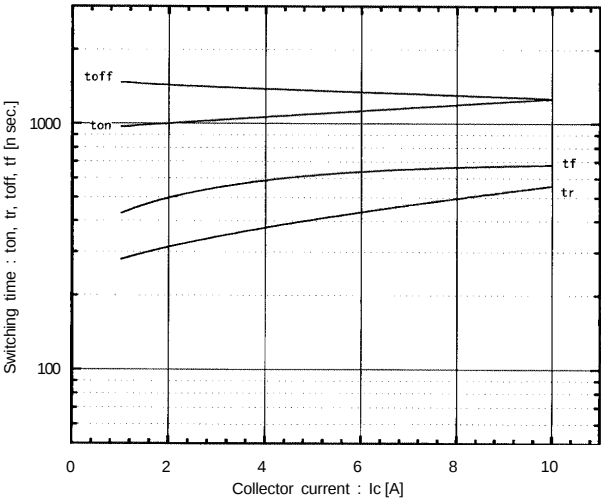
Switching time vs. Collector current

$V_{CC}=600\text{V}, R_G=330\text{ ohm}, V_{GE}=\pm 15\text{V}, T_j=25^{\circ}\text{C}$



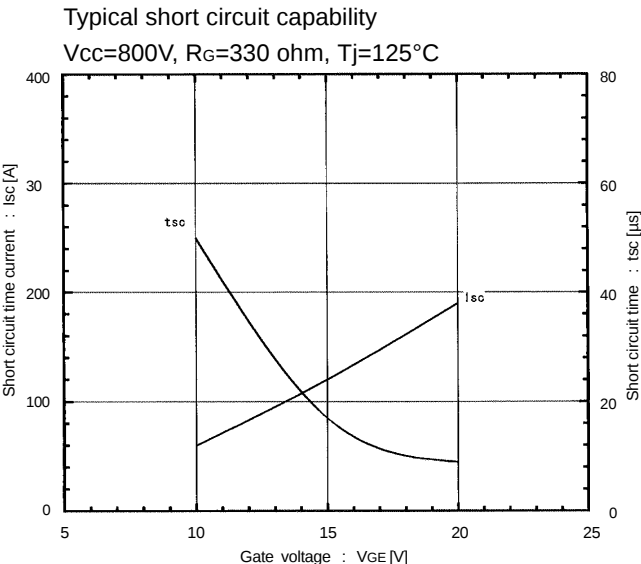
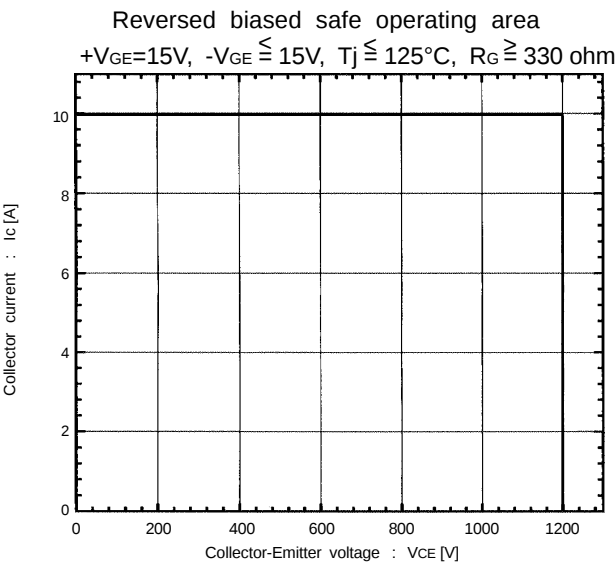
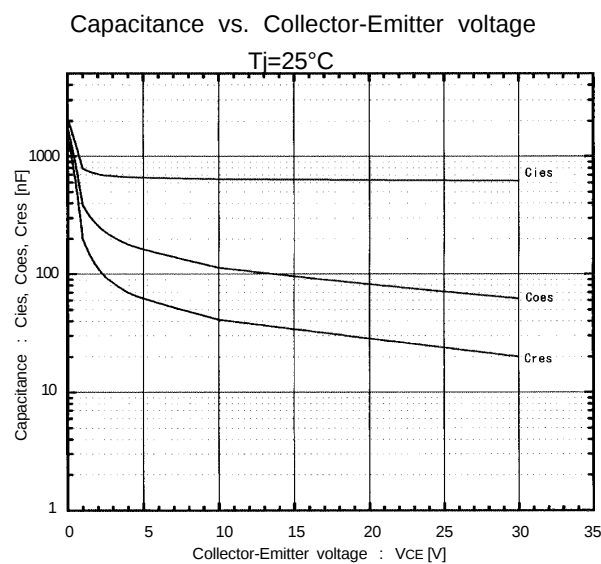
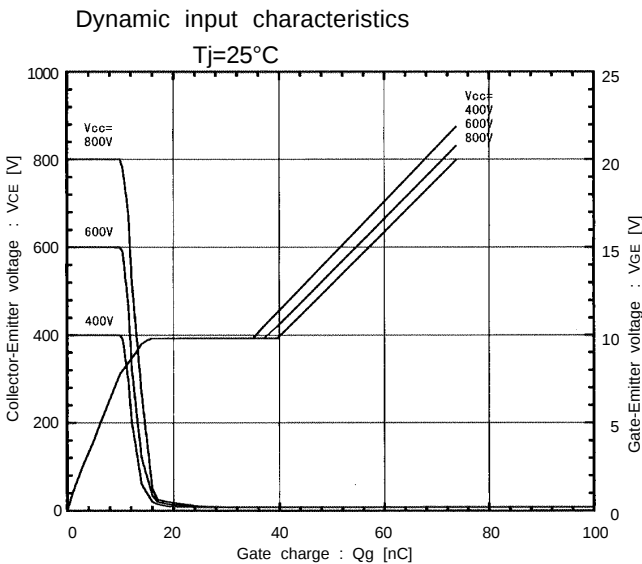
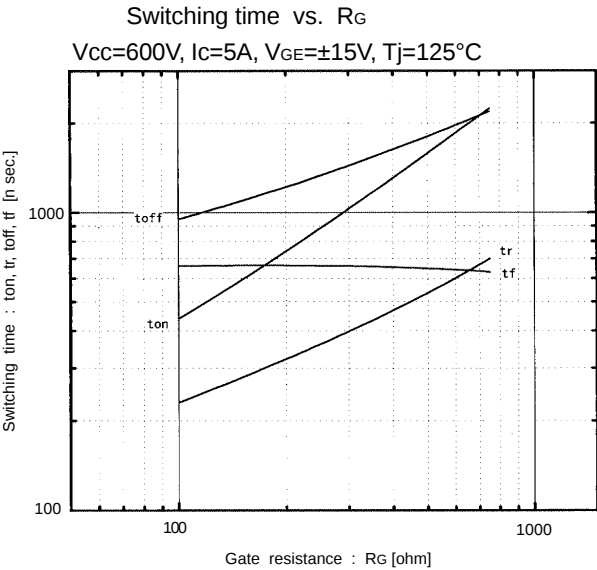
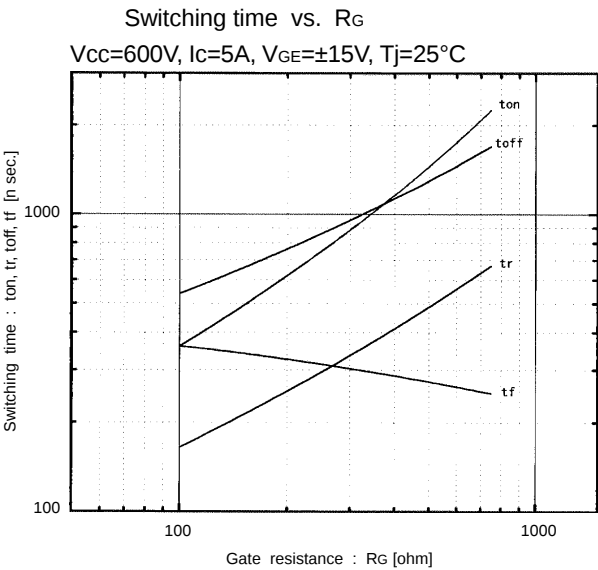
Switching time vs. Collector current

$V_{CC}=600\text{V}, R_G=330\text{ ohm}, V_{GE}=\pm 15\text{V}, T_j=125^{\circ}\text{C}$



Characteristics

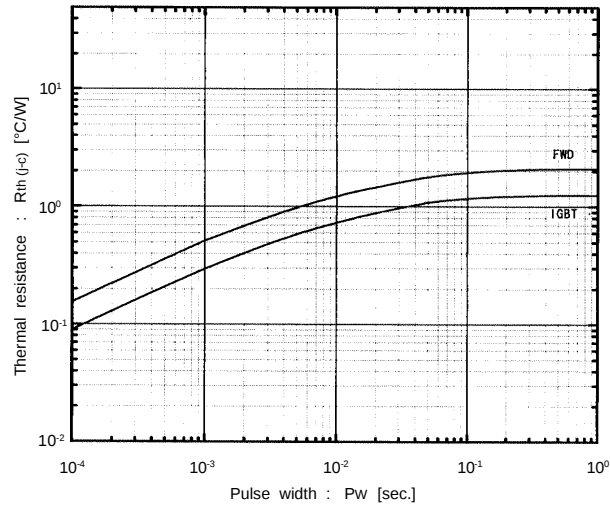
1MB05-120,1MB05D-120



■ Characteristics

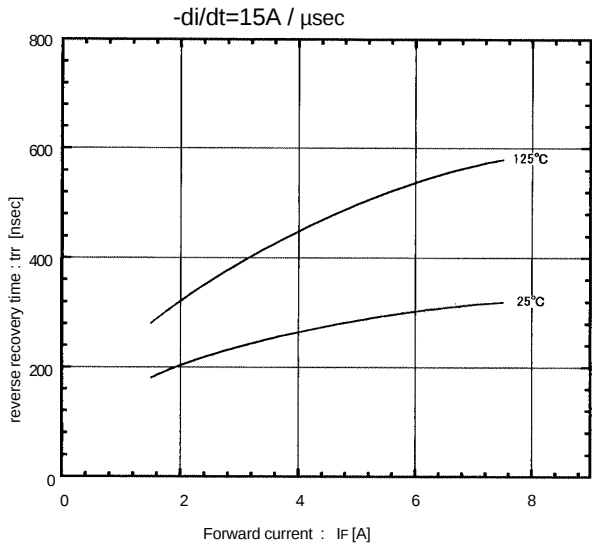
1MB05-120,1MB05D-120

Transient thermal resistance

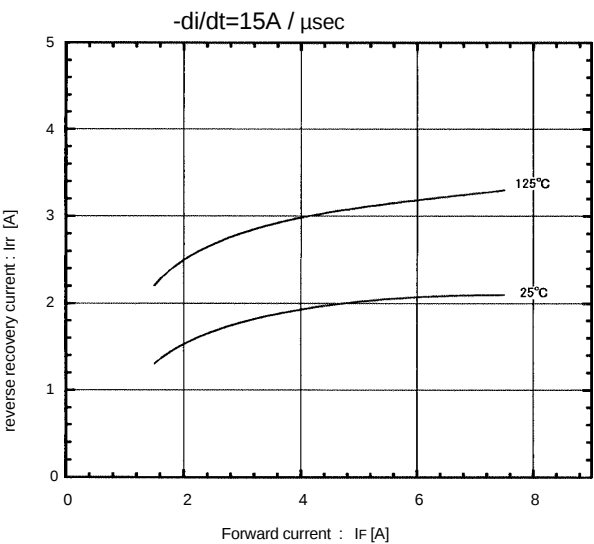


1MB05D-120

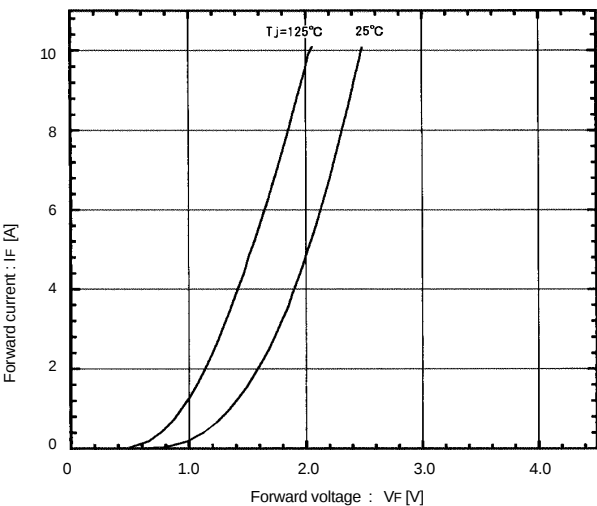
Reverse recovery time vs. Forward current



Reverse recovery current vs. Forward current



Forward current vs. Forward voltage



Reverse recovery time characteristics vs. $-di/dt$

