MDM1200F33-C3

3300V SiC Diode

FEATURES

* Ultra low recovery loss with SiC-SBD.
* Isolated heat sink (terminal to base).
* RoHS

ABSOLUTE MAXIMUM RATINGS (T_C=25°C)

Item		Symbol	Unit	MDM1200F33-C3
Repetitive Peak Reverse Voltage		V_{RRM}	V	3.300
Forward Current	AC peak	I_{MFpeak}	A	1,200
	1ms	I_{Fpulse}		2,400
Operating Junction Temperature		$T_{vj\ op}$	°C	-40 ~ +150
Storage Temperature		T_{stg}	°C	-40 ~ +150 (1)
Isolation Test Voltage	Terminals-base	V_{ISO}	V_{RMS}	6,000(AC 1 minute)
Screw Torque	Terminals (M4/M8)	-	N·m	2/15 (2)
	Mounting (M6)	-		6 (3)

Notes: (1) Terminal temperature shall not exceed the specified temperature in any operation.
(2) Recommended Value 1.8±0.2/15$^{+0}_{-3}$N·m (3) Recommended Value 5.5±0.5N·m

ELECTRICAL CHARACTERISTICS

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Repetitive Reverse Current	I_{RRM}	mA	-	-	12	V_R=3,300V, T_{vj}=25°C
			-	25	65	V_R=3,300V, T_{vj}=150°C
Forward Voltage Drop	V_F	V	-	2.5	-	I_F=1,200A, T_{vj}=25°C
			-	4.97	6.0	I_F=1,200A, T_{vj}=150°C
Reverse Recovery Time	t_{rr}	µs	-	0.1	-	V_R=1,500V, I_F=1,200A, di/dt=-4500A/us, L_S=100nH, T_{vj}=150°C, Rg=4.7Ω, Cge=0.1uF (4)
Reverse Recovery Current	I_{rr}	A	-	200	-	
Reverse Recovery Charge	Q_{rr}	µC	-	25	-	
Reverse Recovery Loss	E_{rr}	J/P	-	0.01	0.12	
I^2t value	I^2t	kA^2s	13	-	-	$T_{j,start}$=150°C, 10ms, V_R=0V, half-sinewave

PACKAGE CHARACTERISTICS

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Terminal Resistance	R_{CE}	mΩ	-	0.13	-	per arm, T_{vj}=25°C
Stray inductance module	L_{SCE}	nH	-	20	-	per arm
Thermal Impedance	$R_{th(j-c)}$	K/W	-	-	0.017	Junction to case (per arm)
Comparative tracking index	CTI		-	600	-	
Contact Thermal Impedance	$R_{th(c-f)}$	K/W	-	0.008	-	Case to fin (per module)

Notes: (4) Counter arm; MBN1200F33F-C3 VGE=+16V/-9V
R_G value is the test condition's value for evaluation of the switching times, not recommended value.
Please, determine the suitable R_G value after the measurement of switching waveforms
(overshoot voltage, etc.) with appliance mounted

* Please contact our representatives at order.
* For improvement, specifications are subject to change without notice.
* For actual application, please confirm this spec sheet is the newest revision.
* ELECTRICAL CHARACTERISTIC items shown in above table are according to IEC 60747–2.

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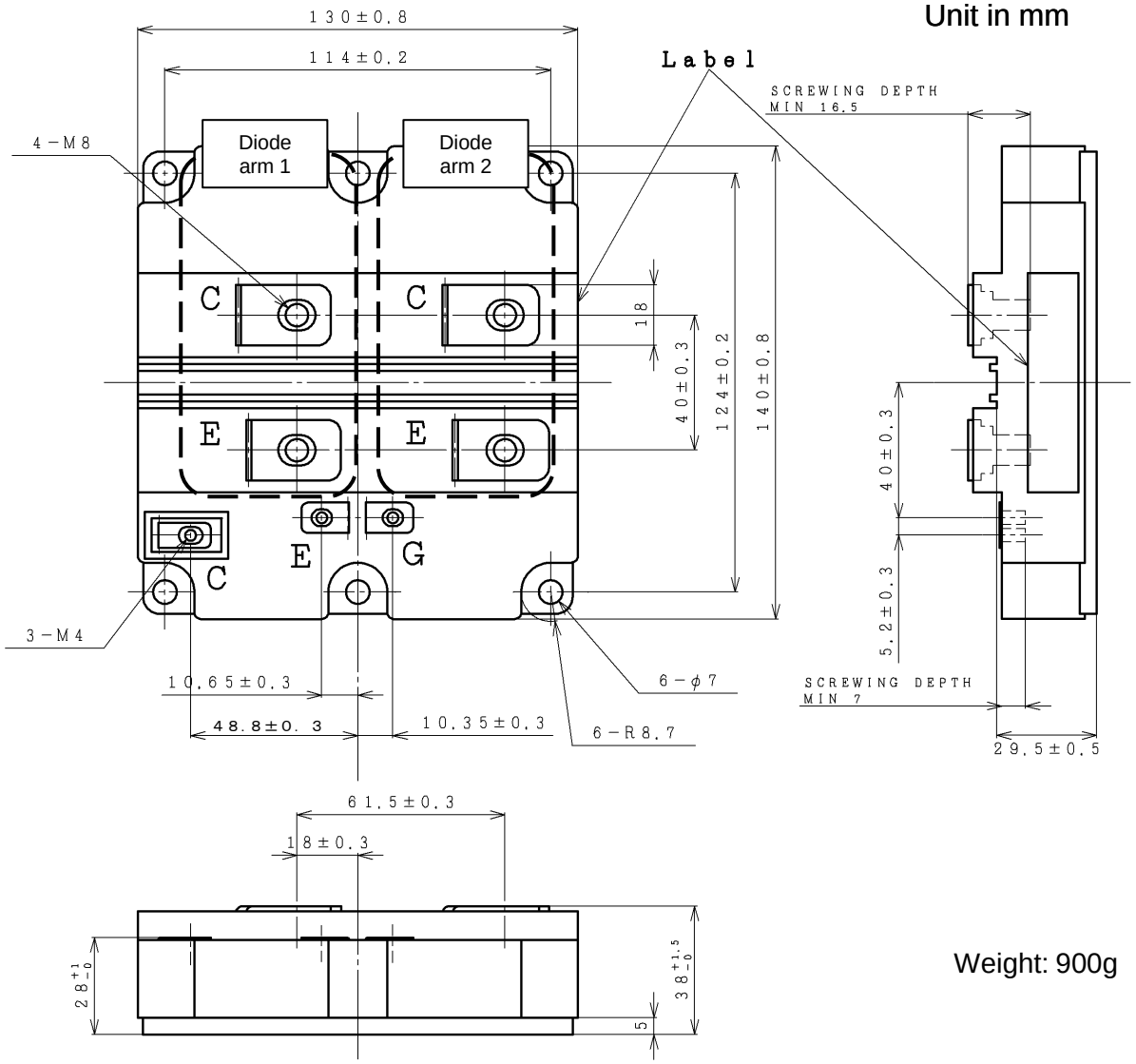
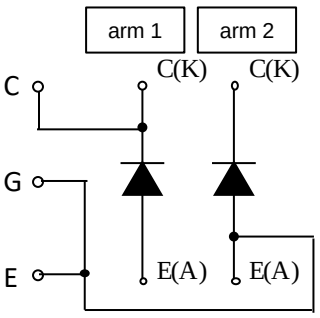
OUTLINE DRAWING

Unit in mm



Weight: 900g

CIRCUIT DIAGRAM



Notice

- Arm1 and Arm2 are not able to use for series connection.
- Auxiliary terminal of Collector, Emitter and Gate are connected to main terminal at internally.

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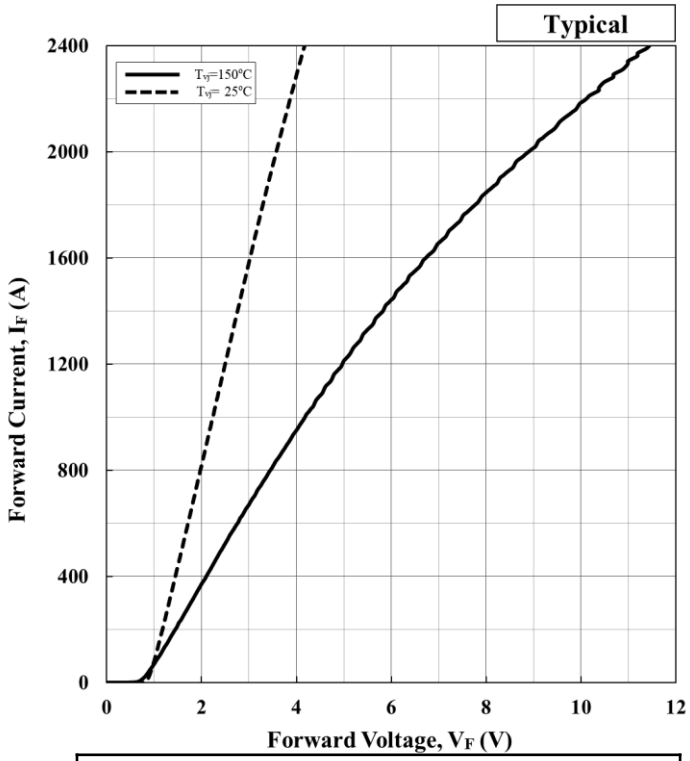
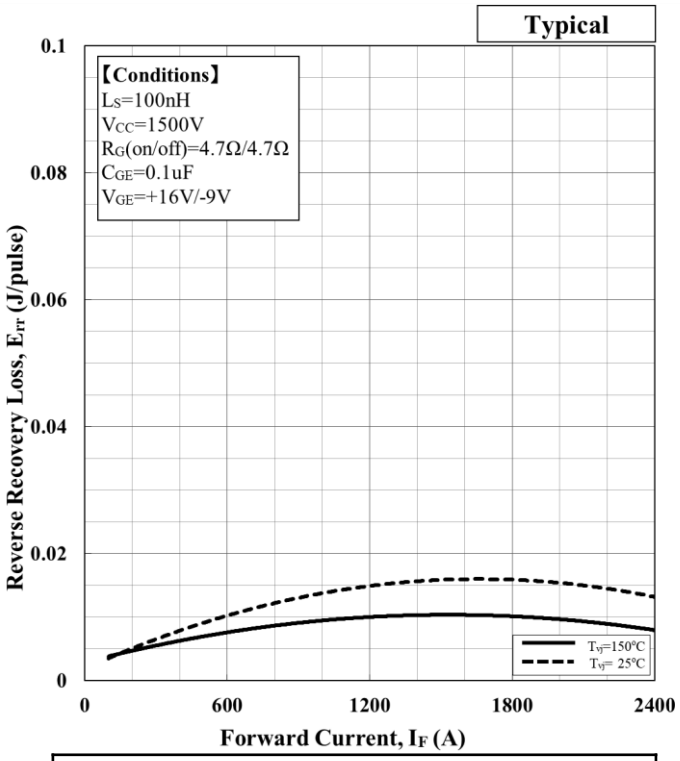


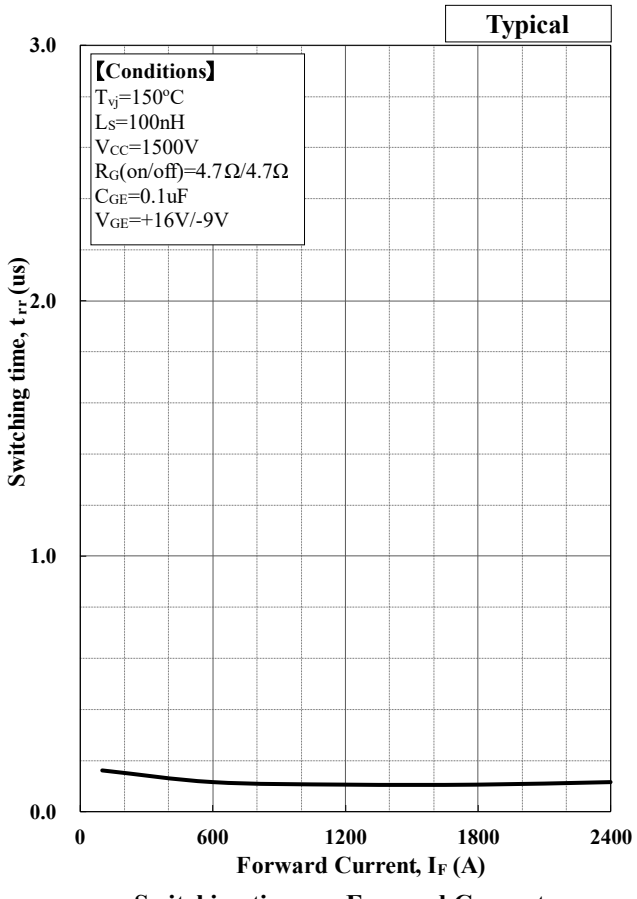
$V_F\,[V] = a_3 \cdot \lvert I_c\rvert^3 + a_2 \cdot \lvert I_c\rvert^2 + a_1 \cdot \lvert I_c\rvert + a_0$				
Temp.[°C]	a_3	a_2	a_1	a_0
25	5.28.E-11	-1.68.E-07	1.47.E-03	8.84.E-01
150	2.63.E-10	-1.43.E-07	3.28.E-03	7.86.E-01

Forward Voltage of diode



$E\,[J] = a_3 \cdot \lvert I_c\rvert^3 + a_2 \cdot \lvert I_c\rvert^2 + a_1 \cdot \lvert I_c\rvert + a_0$				
Temp.[°C]	a_3	a_2	a_1	a_0
25	0.00.E+00	-5.13.E-09	1.70.E-05	1.85.E-03
150	0.00.E+00	-3.20.E-09	9.80.E-06	2.85.E-03

Recovery loss vs. Forward current



Switching time vs. Forward Current

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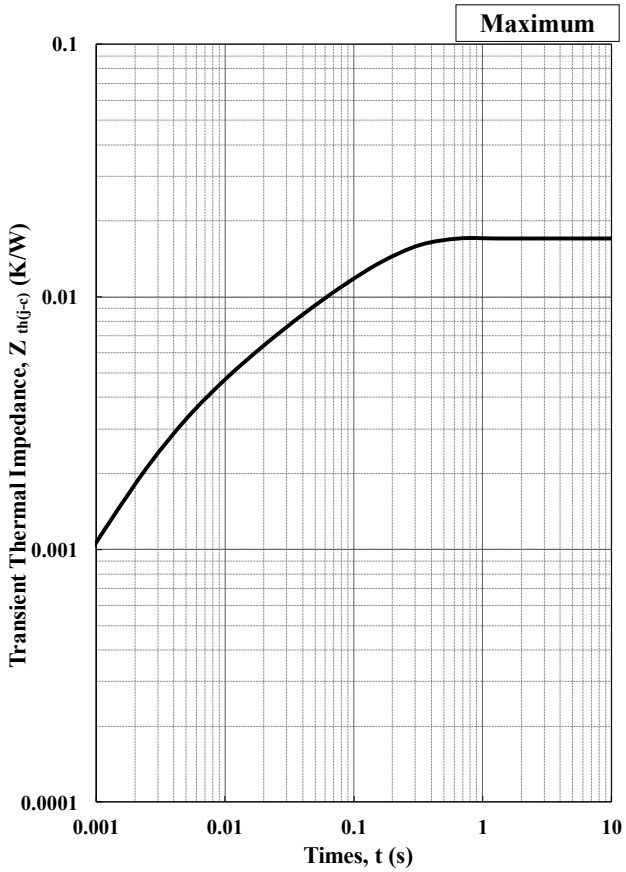

Transient Thermal Impedance Curve

Foster model lumped circuit constant

n	1	2	3	4	Unit
R th, Diode [n}	3.20E-03	2.30E-03	9.51E-03	2.00E-03	[K/W]
C th, Diode [n}	9.37E-01	1.31E+01	1.05E+01	1.50E+02	[J/K]

Cauer model lumped circuit constant

n	1	2	3	4	Unit
R th, Diode [n}	4.32E-03	8.29E-03	3.72E-03	6.77E-04	[K/W]
C th, Diode [n}	8.03E-01	5.53E+00	1.65E+01	4.09E+02	[J/K]

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