

2MBI300HJ-120-50

IGBT Modules

Power Module (V series)
1200V / 300A / 2-in-1 package

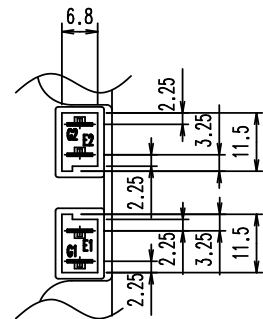
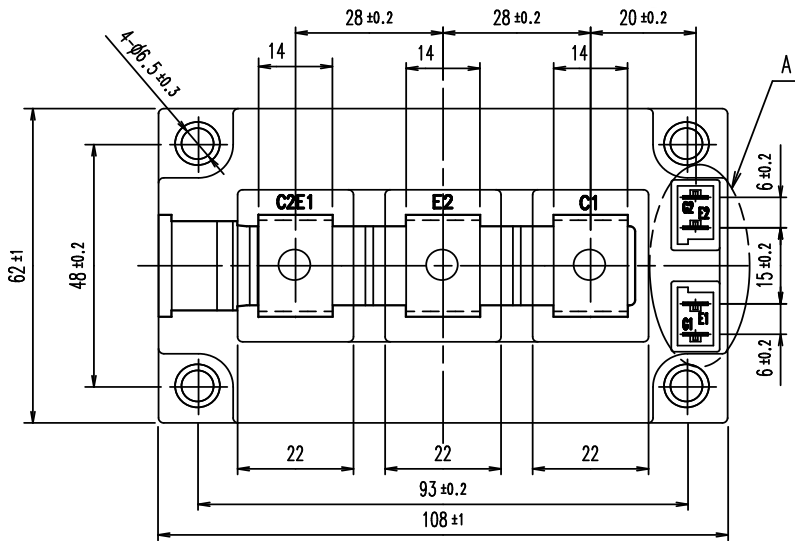
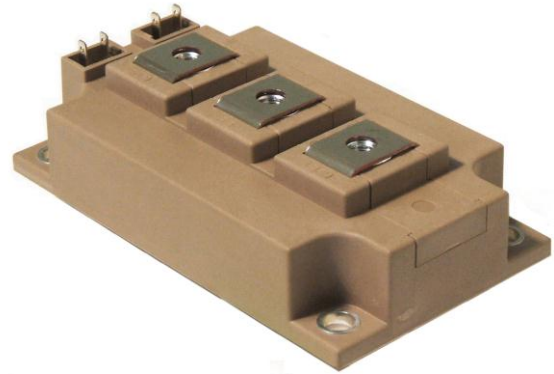
■ **Features**

- High speed switching
- Voltage drive
- Low Inductance module structure

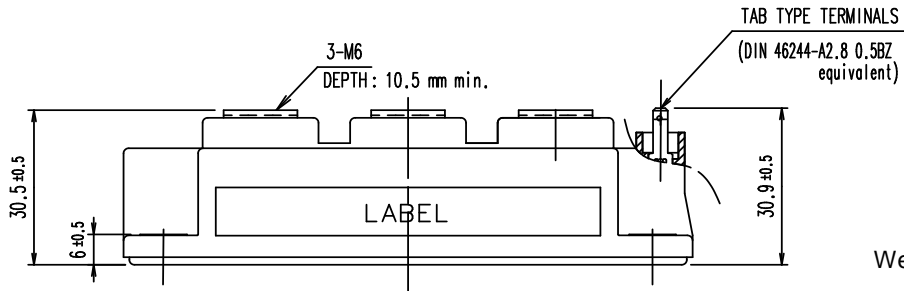
■ **Applications**

- Soft-switching Application
- Industrial machines, such as Welding machines

■ **Outline drawing (Unit : mm)**

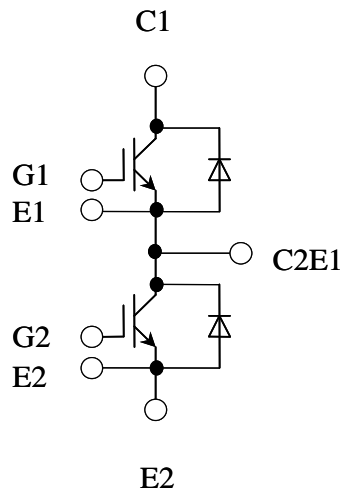


DETAIL A



Weight: 370g (typ.)

■ **Equivalent Circuit**



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

Items		Symbols	Conditions	Maximum Ratings	Units	
Collector-Emitter voltage		V_{CES}		1200	V	
Gate-Emitter voltage		V_{GES}		± 20	V	
Collector current		I_C	Continuous	$T_C=60^\circ\text{C}$ $T_C=25^\circ\text{C}$	300 370	A
		I_C pulse	1ms		600	
		$-I_C$			400	
		$-I_C$ pulse	1ms		800	
Collector power dissipation		P_C	1 device	1950	W	
Junction temperature		T_j		150	°C	
Case temperature		T_c		125		
Storage temperature		T_{stg}		-40 ~ 125		
Isolation voltage	between terminal and copper base (*1)	V_{iso}	AC: 1min.	2500	VAC	
Screw Torque	Mounting (*2)	-		6.0	N m	
	Terminals (*3)	-		5.0		

(*1) All terminals should be connected together during the test.

(*2) Recommendable Value : 3.0-6.0 Nm (M5 or M6)

(*3) Recommendable Value : 2.5-5.0 Nm (M6)

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

Items	Symbols	Conditions	Characteristics			Units	
			min.	typ.	max.		
Zero gate voltage Collector current	I _{CES}	V _{GE} =0V, V _{CE} =1200V	-	-	4.0	mA	
Gate-Emitter leakage current	I _{GES}	V _{CE} =0V, V _{GE} =±20V	-	-	800	nA	
Gate-Emitter threshold voltage	V _{GE(th)}	V _{CE} =20V, I _C =300mA	5.7	6.2	6.7	V	
Collector-Emitter saturation voltage	V _{CE(sat)} (terminal)	V _{GE} =15V, I _C =300A	T _j =25°C	-	3.40	3.70	V
			T _j =125°C	-	4.20	-	
	V _{CE(sat)} (chip)	V _{GE} =15V, I _C =300A	T _j =25°C	-	3.20	3.50	
			T _j =125°C	-	4.00	-	
Internal gate	R _{G(int)}	-	-	0.5	-	Ω	
Input capacitance	C _{ies}	V _{CE} =10V, V _{GE} =0V, f=1MHz	-	36.0	-	nF	
Turn-on time	t _{on}	V _{CC} = 600V I _C = 300A V _{GE} = ±15V R _G = 3.3Ω T _j = 125°C L _S = 30nH	-	250	-	nsec	
	t _r		-	180	-		
	t _{r(i)}		-	40	-		
t _{off}	-		300	-			
Turn-off time	t _f	-	50	-	-		
Forward on voltage	V _F (terminal)	V _{GE} =0V, I _F =400A	T _j =25°C	-	1.85	2.30	V
			T _j =125°C	-	2.00	-	
	V _F (chip)	V _{GE} =0V, I _F =400A	T _j =25°C	-	1.70	2.15	
			T _j =125°C	-	1.85	-	
Reverse recovery time	t _{rr}	I _F =400A	-	130	-	nsec	

5. Thermal resistance characteristics

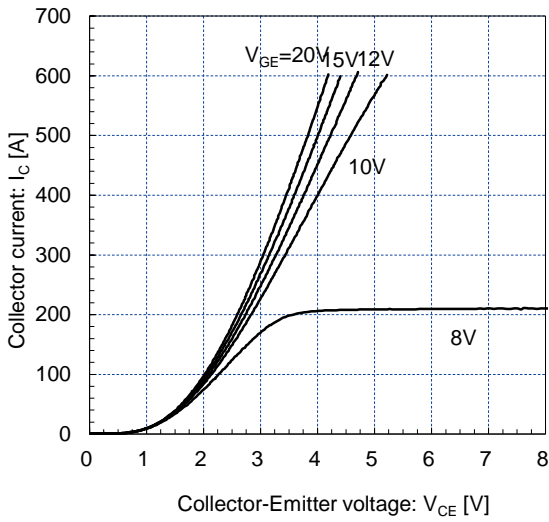
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance(1dev)	R _{th(j-c)}	IGBT	-	-	0.064	°C/W
		FWD	-	-	0.110	
Contact thermal resistance	R _{th(c-f)}	with Thermal Compound	-	0.0125	-	

(*1) This is the value which is defined mounting on the additional cooling fin with thermal compound.

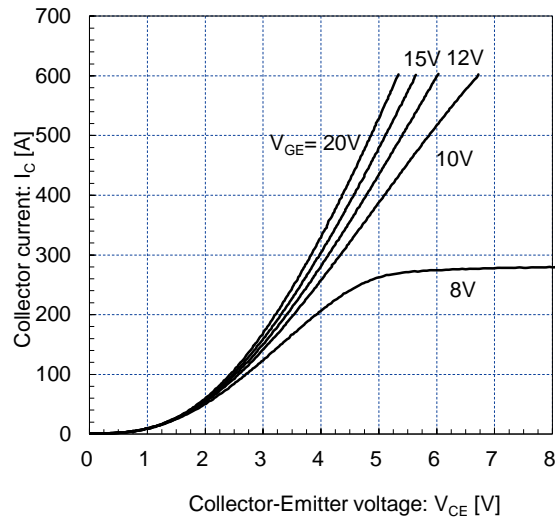
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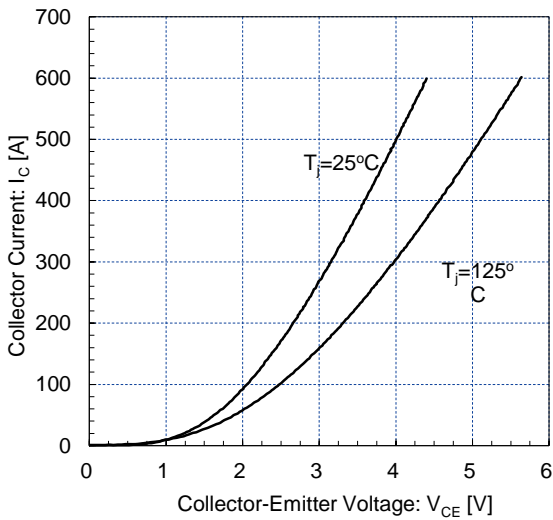
Collector current vs. Collector-Emittor voltage
 $T_i = 25^\circ\text{C} / \text{chip}$



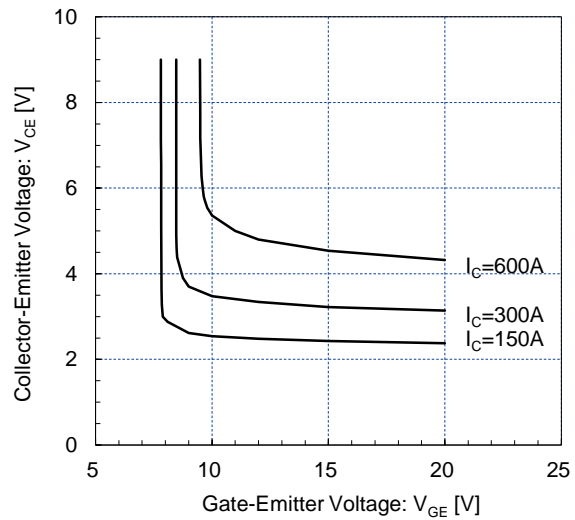
Collector current vs. Collector-Emittor voltage (typ.)
 $T_i = 125^\circ\text{C} / \text{chip}$



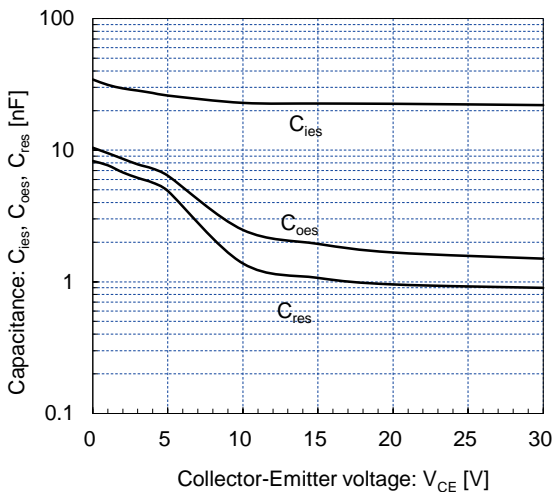
Collector current vs. Collector-Emittor voltage
 $V_{GE} = 15\text{V} / \text{chip}$



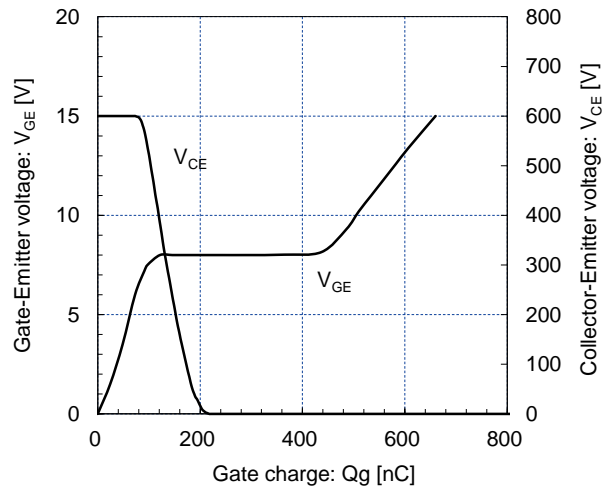
Collector-Emittor voltage vs. Gate-Emittor voltage
 $T_i = 25^\circ\text{C} / \text{chip}$



Capacitance vs. Collector-Emittor Voltage
 $V_{GE} = 0\text{V}, f = 1\text{MHz}, T_i = 25^\circ\text{C}$



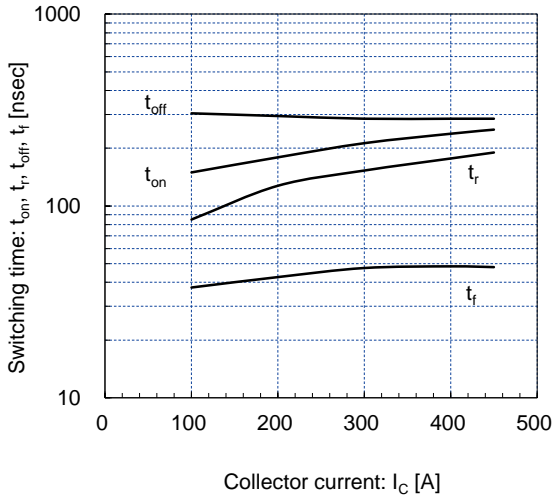
Dynamic Gate Charge (typ.)
 $V_{CC} = 600\text{V}, I_C = 300\text{A}, T_j = 25^\circ\text{C}$



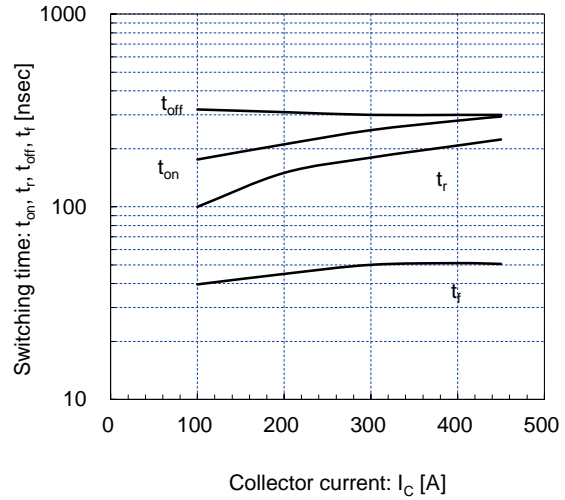
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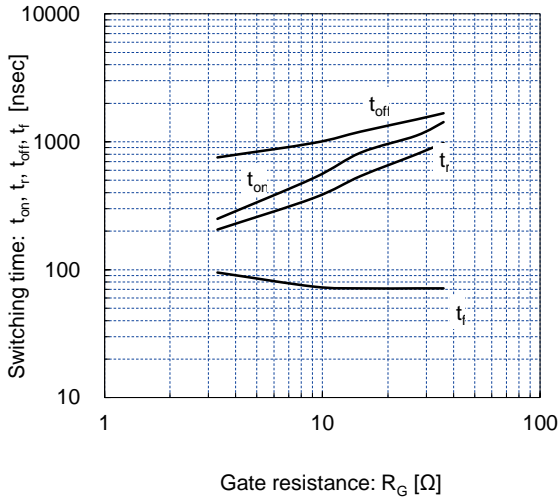
Switching time vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=3.3\Omega, T_j=25^\circ C$



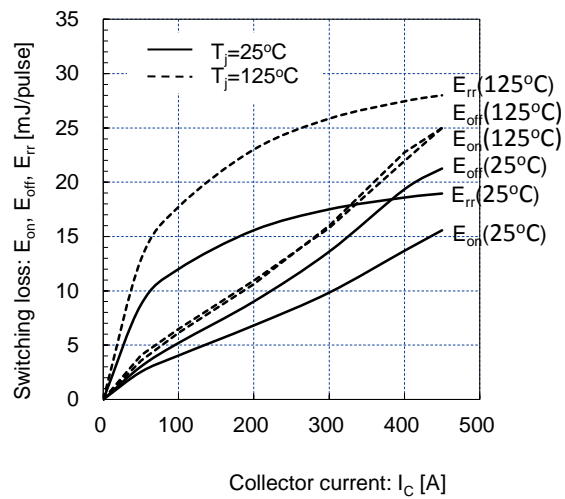
Switching time vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=3.3\Omega, T_j=125^\circ C$



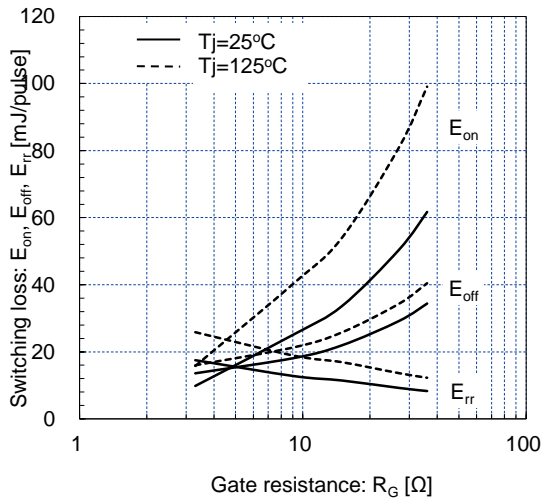
Switching time vs. Gate resistance (typ.)
 $V_{CC}=600V, I_C=300A, V_{GE}=\pm 15V, T_j=125^\circ C$



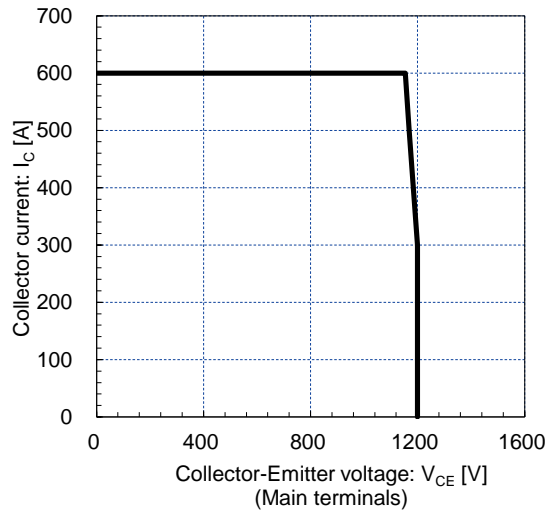
Switching loss vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=3.3\Omega, T_j=25, 125^\circ C$



Switching loss vs. Gate resistance (typ.)
 $V_{CC}=600V, I_C=300A, V_{GE}=\pm 15V, T_j=25, 125^\circ C$



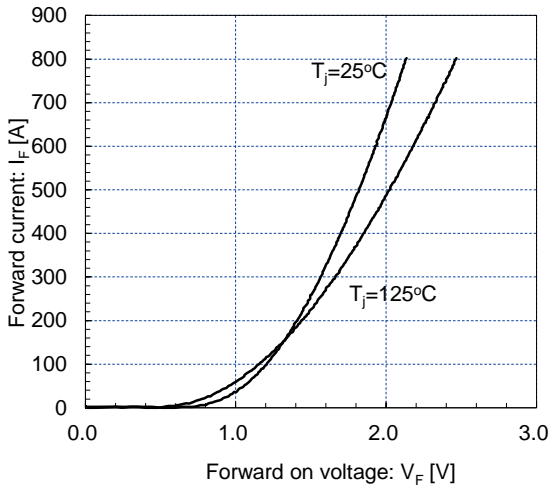
Reverse bias safe operating area (max.)
 $+V_{GE}=15V, -V_{GE}=15V, R_g=3.3\Omega, T_j=125^\circ C$



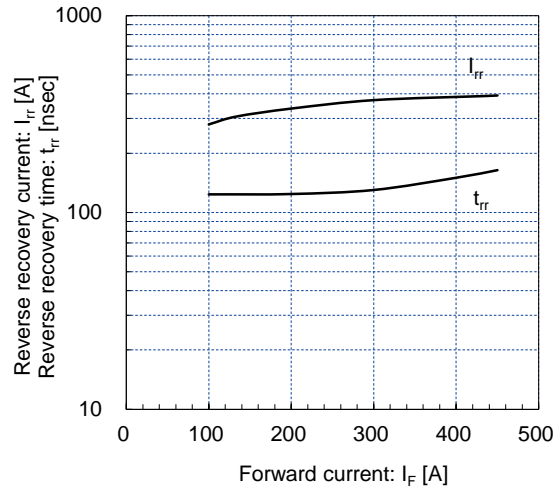
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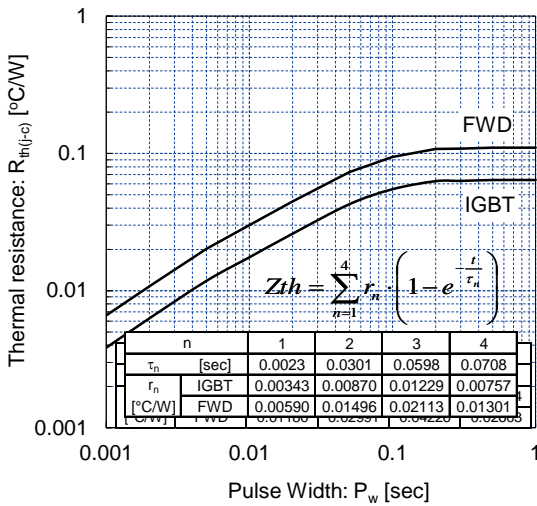
Forward current vs. Forward vltage (typ.)
chip



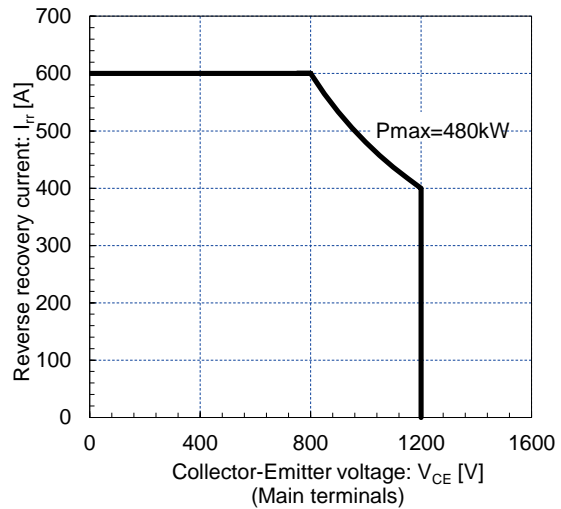
Reverse recovery characteristics (typ.)
 $V_{CC}=600\text{V}$, $V_{GE}=\pm 15\text{V}$, $R_g=3.3\Omega$, $T_j=125^\circ\text{C}$



Transient thermal resistance (max.)



FWD safe operating area (max.)
 $T_i = 125^\circ\text{C}$



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IGBT Modules

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