

2MBI200HJ-120-50

IGBT Modules

Power Module (V series)
1200V / 200A / 2-in-1 package

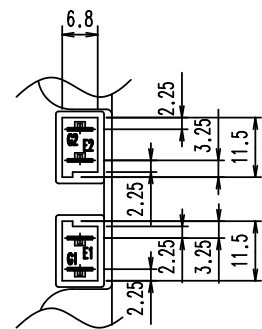
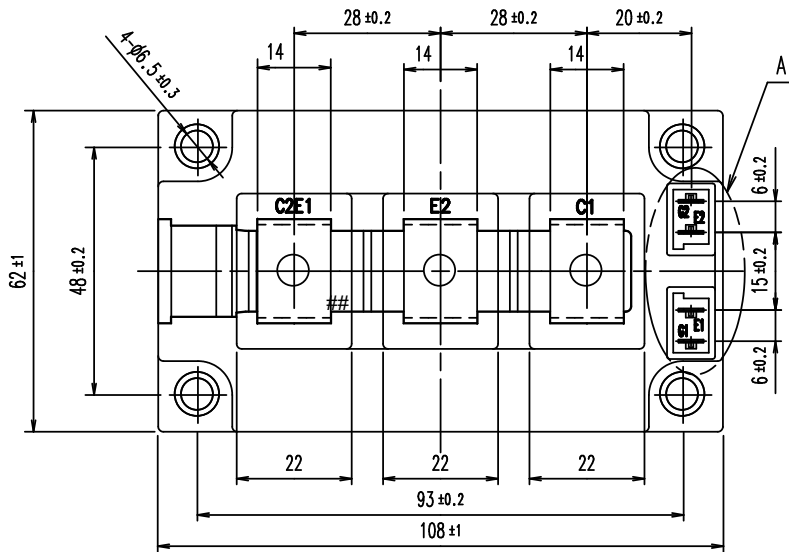
■ **Features**

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

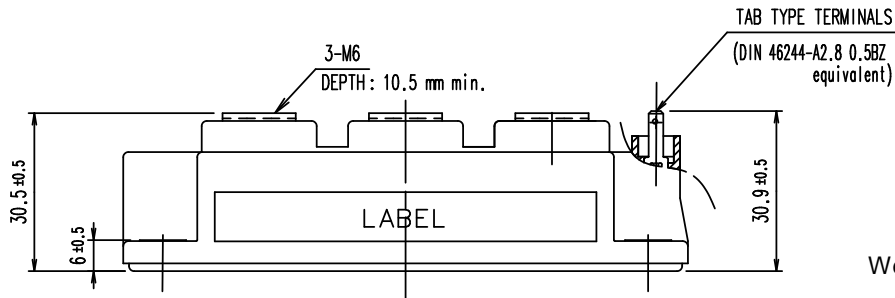
■ **Applications**

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

■ **Outline drawing (Unit : mm)**

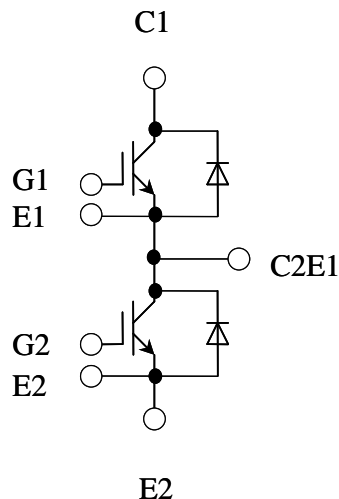


DETAIL A



Weight: 370g (typ.)

■ **Equivalent Circuit**



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IGBT Modules
■ Absolute Maximum Ratings (at $T_C = 25^\circ\text{C}$ 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	$T_C = 80^\circ\text{C}$	200	A
				$T_C = 25^\circ\text{C}$	275	
	I_C pulse	1ms		400		
	$-I_C$			400		
		$-I_C$ pulse	1ms		800	
Collector power dissipation		P_C	1 device	1385	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 $T_j=25^\circ\text{C}$ 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}	$V_{CE}=0V, V_{GE}=\pm 20V$	-	-	800	nA	
Gate-Emitter threshold voltage	$V_{GE(th)}$	$V_{CE}=20V, I_c=200mA$	5.7	6.2	6.7	V	
Collector-Emitter saturation voltage	$V_{CE(sat)}$ (terminal)	$V_{GE}=15V, I_c=200A$	$T_j=25^\circ\text{C}$	-	3.60	3.90	V
			$T_j=125^\circ\text{C}$	-	4.50	-	
	$V_{CE(sat)}$ (chip)	$V_{GE}=15V, I_c=200A$	$T_j=25^\circ\text{C}$	-	3.20	3.50	
			$T_j=125^\circ\text{C}$	-	4.10	-	
Internal gate resistance	$R_{G(int)}$	-	-	0.8	-	Ω	
Input capacitance	C_{ies}	$V_{CE}=10V, V_{GE}=0V, f=1MHz$	-	15.2	-	nF	
Turn-on time	t_{on}	$V_{CC}=600V, I_c=200A$ $V_{GE}=\pm 15V, R_G=4.7\Omega$ $T_j=125^\circ\text{C}, L_s=30nH$	-	250	-	nsec	
	t_r		-	180	-		
	$t_{r(l)}$		-	40	-		
Turn-off time	t_{off}		-	300	-		
	t_f		-	50	-		
Forward on voltage	V_F (terminal)		$V_{GE}=0V, I_F=300A$	$T_j=25^\circ\text{C}$	-	2.15	2.40
		$T_j=125^\circ\text{C}$		-	2.30	-	
	V_F (chip)	$V_{GE}=0V, I_F=300A$	$T_j=25^\circ\text{C}$	-	1.70	1.95	
			$T_j=125^\circ\text{C}$	-	1.85	-	
Reverse recovery time	t_{rr}	$I_F=200A$	-	130	-	nsec	

5. Thermal resistance characteristics

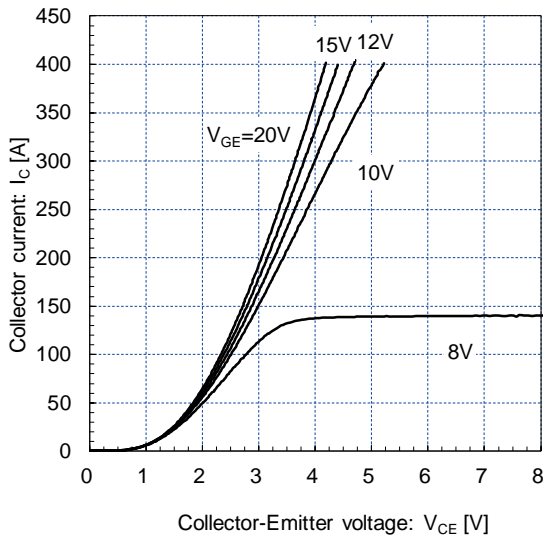
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	$R_{th(j-c)}$	IGBT	-	-	0.090	$^\circ\text{C/W}$
		FWD	-	-	0.140	
Contact thermal resistance (1device) (*1)	$R_{th(c-f)}$	with thermal compound	-	0.0125	-	

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

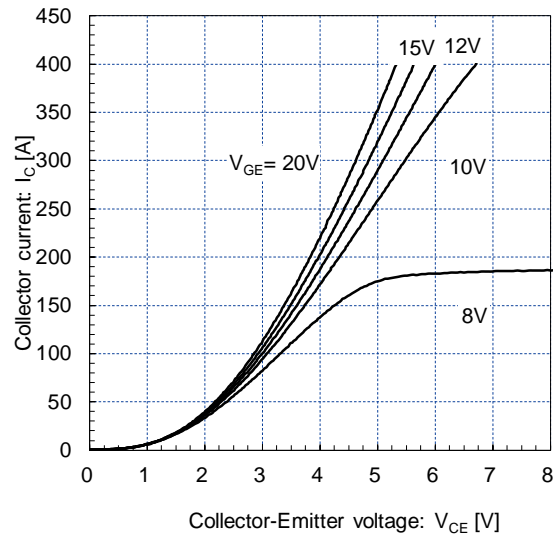
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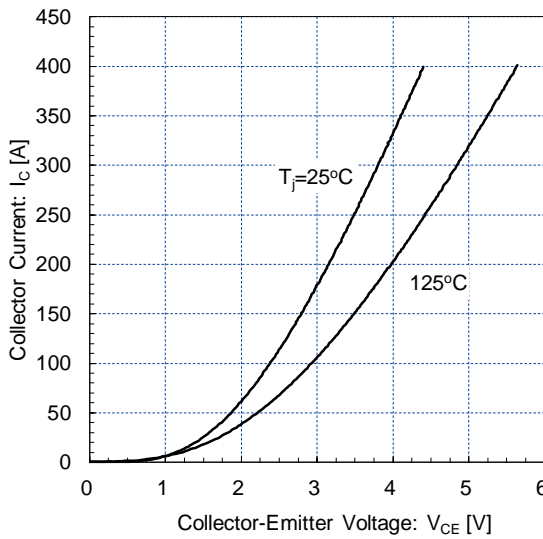
Collector current vs. Collector-Emitter voltage
 $T_j = 25^\circ\text{C}$ / chip



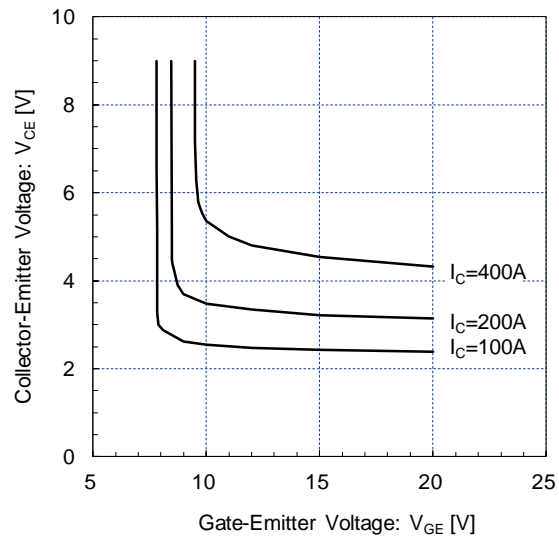
Collector current vs. Collector-Emitter voltage (typ.)
 $T_j = 125^\circ\text{C}$ / chip



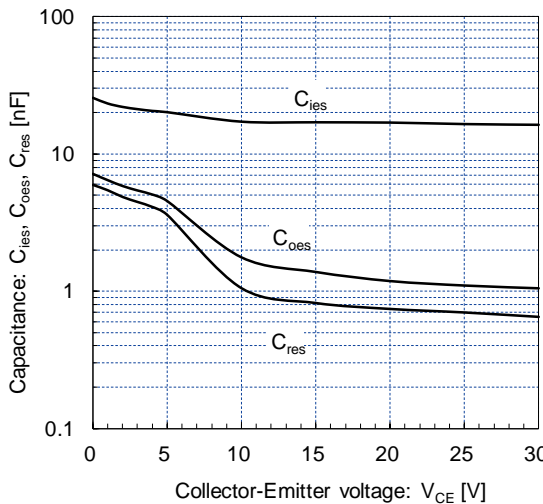
Collector current vs. Collector-Emitter voltage
 $V_{GE} = 15\text{V}$ / chip



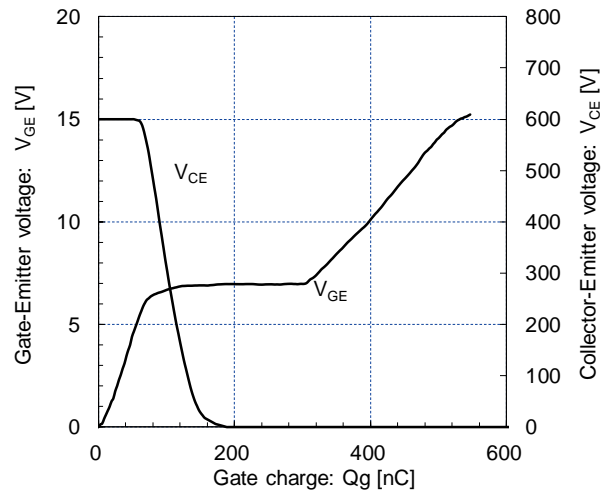
Collector-Emitter voltage vs. Gate-Emitter voltage
 $T_j = 25^\circ\text{C}$ / chip



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



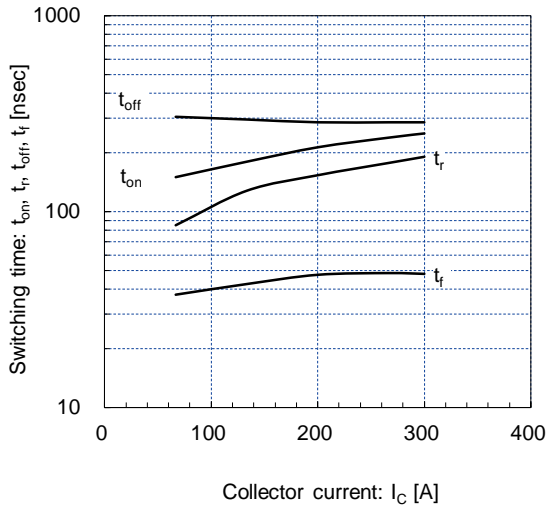
Dynamic Gate Charge (typ.)
 $V_{CC} = 600\text{V}$, $I_C = 200\text{A}$, $T_j = 25^\circ\text{C}$



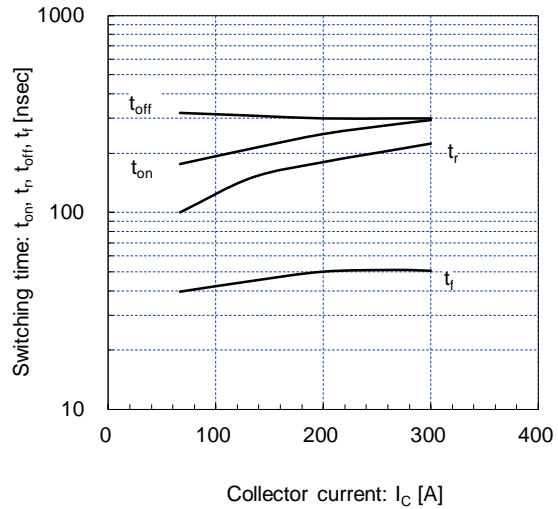
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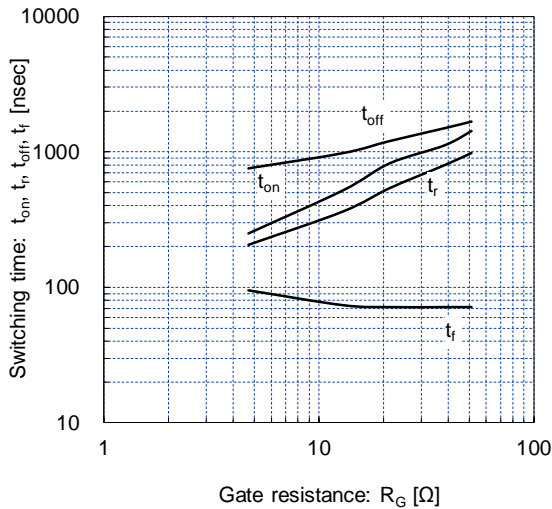
Switching time vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=4.7\Omega, T_j=25^\circ C$



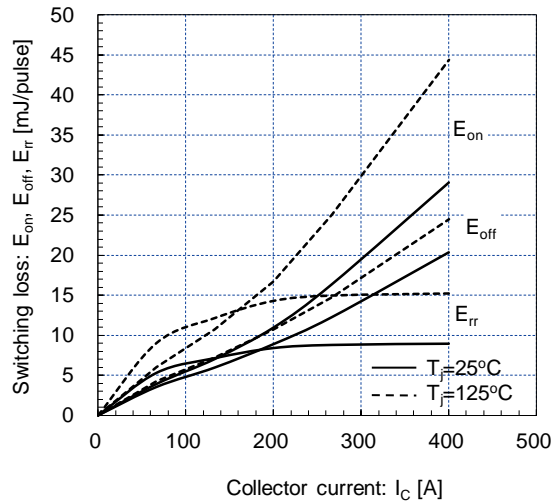
Switching time vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=4.7\Omega, T_j=125^\circ C$



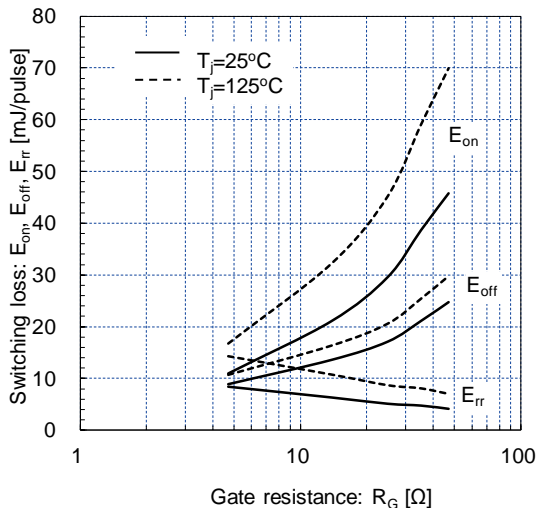
Switching time vs. Gate resistance (typ.)
 $V_{CC}=600V, I_C=200A, V_{GE}=\pm 15V, T_j=125^\circ C$



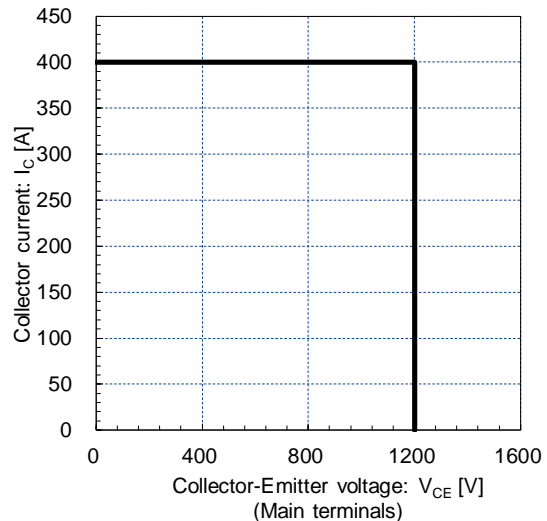
Switching loss vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=4.7\Omega, T_j=25, 125^\circ C$



Switching loss vs. Gate resistance (typ.)
 $V_{CC}=600V, I_C=200A, V_{GE}=\pm 15V, T_j=25, 125^\circ C$



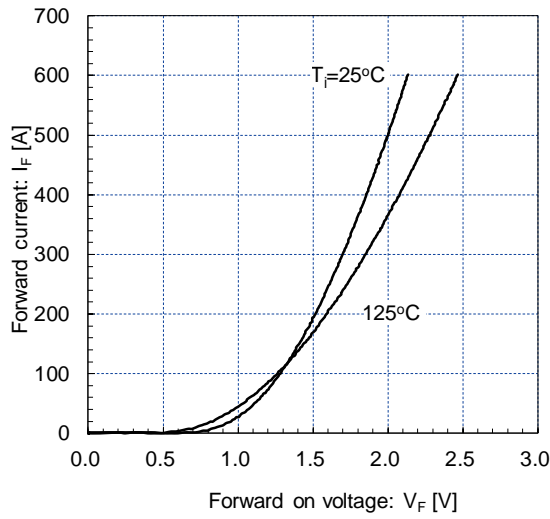
Reverse bias safe operating area (max.)
 $+V_{GE}=15V, -V_{GE}=15V, R_g=4.7\Omega, T_j=125^\circ C$



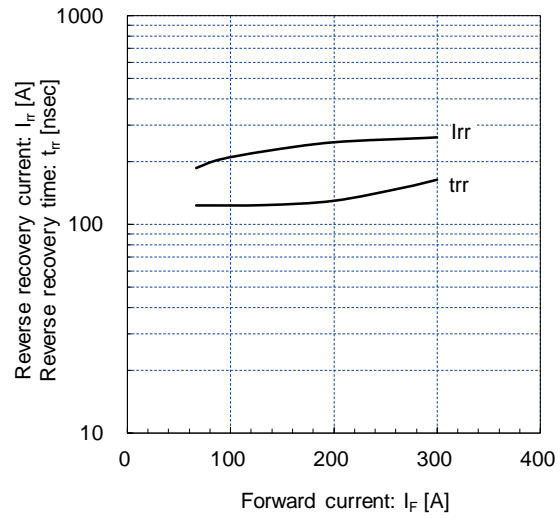
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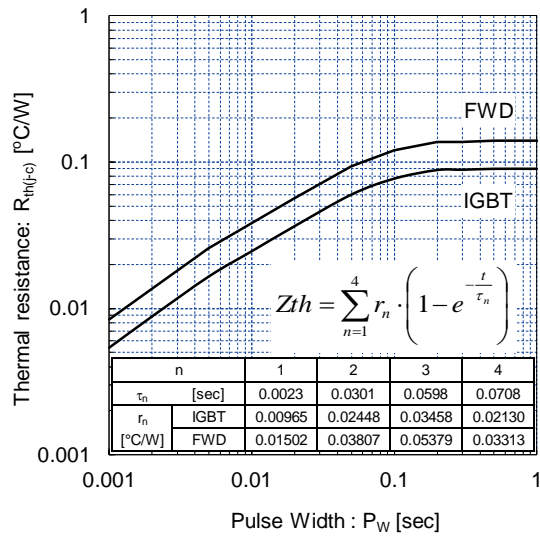
Forward current vs. Forward voltage (typ.)
chip



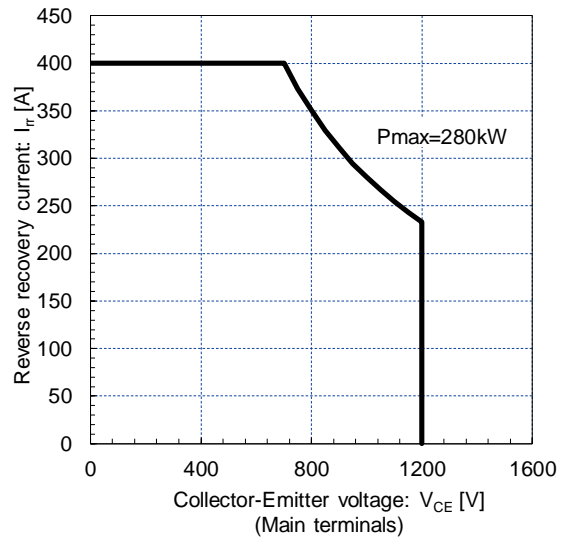
Reverse recovery characteristics (typ.)
V_{cc}=600V, V_{GE}=±15V, R_g=4.7Ω, T_J=125°C



Transient thermal resistance (max.)



FWD safe operating area (max.)
T_J = 125°C



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