FEATURES

Preliminary Data
VCES = 650V
IC nom = 200A / ICRM = 200A

- V_{CEsat} with positive temperature coefficient

- Low Vcesat

- Low switching losses

- Low inductance case

- Isolated copper baseplate using DBC technology

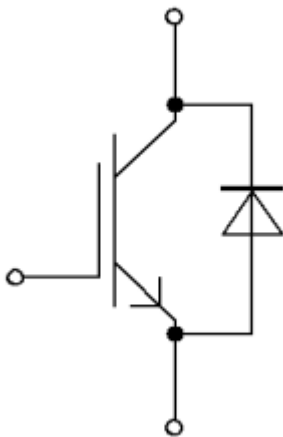## APPLICATION

- Welding Machine

- UPS

Equivalent Circuit Schematic

LGM200SG65S1T1

IGBT, Inverter
Maximum Rated Values

Parameter	Conditions	Symbol	Values	Units
Collector-emitter voltage	Tvj = 25°C	V_{CES}	650	V
Continuous DC collector current	Tc = 70°C, Tvj max = 150°C	I_C	200	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	400	A
Total power dissipation	TC = 25°C, Tvj max = 150°C	P_{tot}	446	W
Gate-emitter peak voltage		V_{GES}	±20	V

Characteristic Values

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Units
Collector-emitter saturation voltage	I_C = 200A, V_{GE} = 15 V Tvj = 25°C	V_{CEsat}		1.55		V
Gate threshold voltage	I_C = 1.5 mA, V_{CE} = V_{GE} Tvj = 25°C	V_{GEth}		5.8		V
Gate charge	V_{GE} = -15 / 15 V	Q_G		4.2		µC
Input capacitance	f = 1 MHz, Tvj = 25°C, V_{CE} = 25 V, V_{GE} = 0 V	C_{ies}		24		nF
Reverse transfer capacitance		C_{res}		0.81		nF
Collector-emitter cut-off current	V_{CE} = 650 V, V_{GE} = 0 V, Tvj = 25°C	I_{CES}			1.0	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, Tvj = 25°C	I_{GES}			400	nA
Turn-on delay time, inductive load	I_C = 200A, V_{CE} = 400 V V_{GE} = -15 / 15 V , RG = 22Ω Di/dt (on) =1000A/us Dv/dt (off) =2900A/us Tvj = 25°C	$t_{d\ on}$		0.57		µs
Rise time, inductive load		t_r		0.32		µs
Turn-off delay time, inductive load		$t_{d\ off}$		1.10		µs
Fall time, inductive load		t_f		0.15		µs
Turn-on energy loss per pulse		E_{on}		20.6		mJ
Turn-off energy loss per pulse		E_{off}		26.1		mJ
Thermal resistance, junction to case	per IGBT	RthJC			0.28	K/W
Thermal resistance, case to heatsink	per IGBT λPaste＝1 W/(m·K) /λgrease＝1 W/(m·K)	RthCH		0.04		K/W
Temperature under switching conditions		Tvj op	-40		150	°C

LGM200SG65S1T1

Diode, Inverter
Maximum Rated Values

Parameter	Conditions	Symbol	Values	Units
Repetitive peak reverse voltage	Tvj = 25°C	VRRM	650	V
Continuous DC forward current		IF	200	A
Repetitive peak forward current	t_P = 1 ms	IFRM	400	A

Characteristic Values

Parameter	Conditions	Symbol	Values			Units
			Min.	Typ.	Max.	
Forward voltage	I_F = 200 A, V_{GE} = 0 V Tvj = 25°C	V_F		1.85		V
Peak reverse recovery current	I_F = 200 A, V_R = 400 V, VGE = -15 V RG = 22Ω Tvj = 25°C	I_{RR}		101		A
Recovered charge		Q_{RR}		6		µC
Reverse recovery energy		E_{rec}		1.02		mJ
Thermal resistance, junction to case	per diode	R_{thJC}			0.9	K/W
Thermal resistance, case to heatsink	per diode I_{Paste} = 1 W/(m·K) / I_{grease} = 1 W/(m·K)	R_{thCH}		0.08		K/W
Temperature under switching conditions		$T_{vj\ op}$	-40		150	°C

Module
Characteristic Values

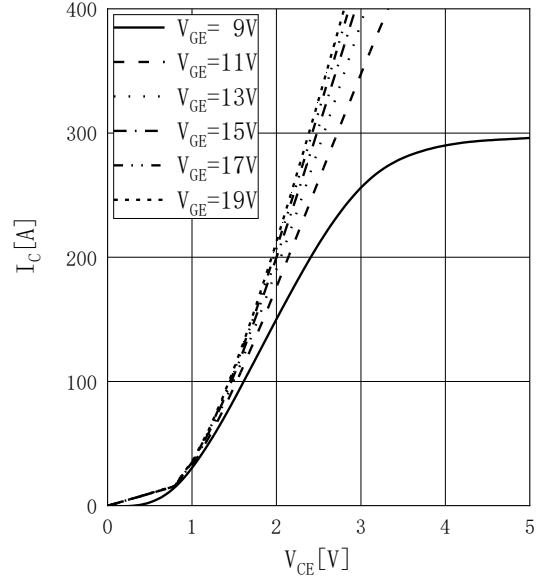| Parameter	Conditions	Symbol	Values			Units
			Min.	Typ.	Max.	
Terminal Connection Torque, Screw M4 Mounting Torque,Screw M4		M	1.1 1.1		1.5 1.5	N
Weight		G		33		g

Output characteristic IGBT, Inverter (typical)
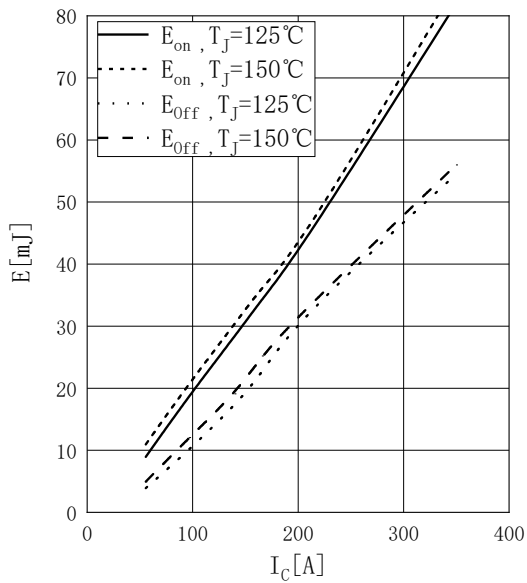
$I_C = f(V_{CE})$
$V_{GE} = 15V$

Output characteristic IGBT, Inverter (typical)
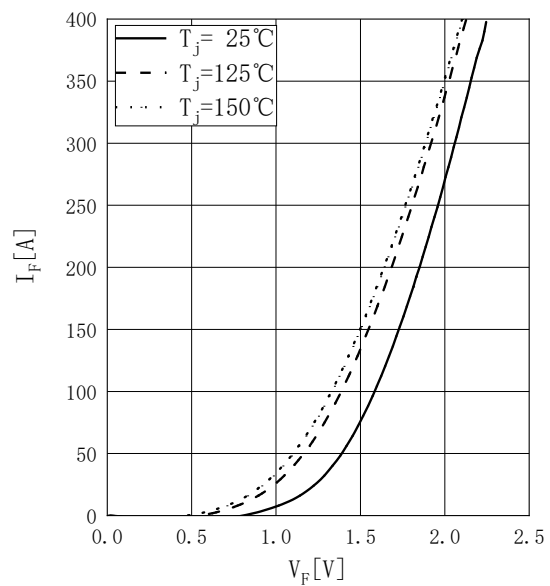
$I_C = f(V_{CE})$
$T_J = \,^{\circ}C$

Switching losses IGBT, Inverter(typical)

$E_{on} = f(I_C)$, $E_{off} = f(I_C)$
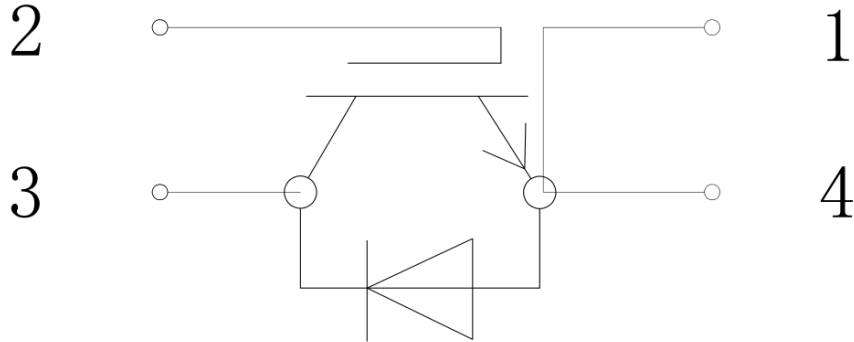$V_{GE} = \pm 15V$, $R_{Gon} = 20\Omega$, $R_{Goff} = 20\Omega$, $V_{CE} = 400V$

Forward characteristic of Diode, Inverter (typical)

$I_F = f(V_F)$

Circuit diagram

Package outlines (mm)