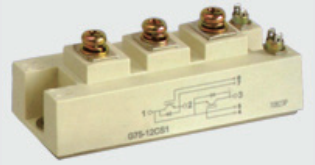
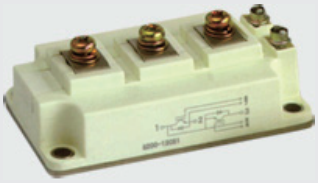




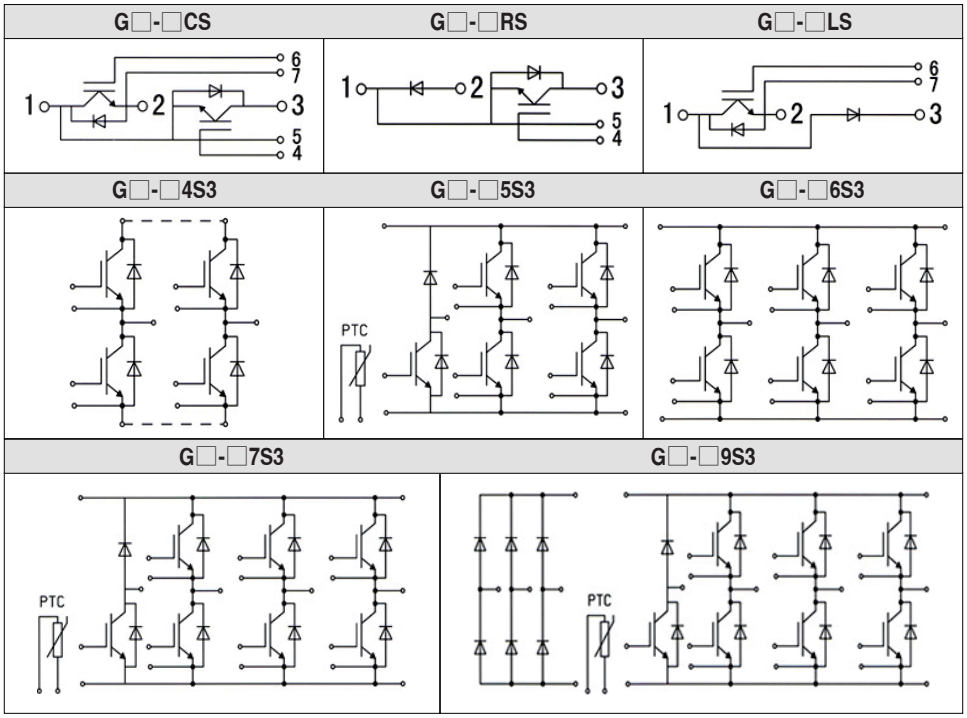
Characteristics

- SPT chip (soft-punch-through)
- MOS input control
- Ultrathin IGBT chip, great current low loss, low tail current
- Low VCE (sat) saturated voltage, positive temperature coefficient at high temperature
- High switch frequency, low switch loss
- High SC resistive ability
- Module creepage long distance design
- DBC insulated voltage above 2500VRMS

Typical Applications

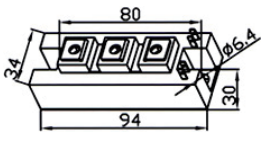
- AC and DC electric motor control
- Frequency transformer
- UPS
- Industry calefaction power supply
- Electric welding machine

Internal structure



Major parameters

Parameters	Collector current Ic (A)					Vces(v) Collector-Emitter Voltage
Model	50,75,100,145	150,200,300,400	10,15,25,40	25,50	50,75	600,1200,1700
	G□-□CS	G□-□CS	G□-□4S3	G□-□4S3	G□-□4S3	
	G□-□RS	G□-□RS	G□-□5S3	G□-□5S3	G□-□6S3	
	G□-□LS	G□-□LS	G□-□6S3	G□-□6S3		
			G□-□7S3	G□-□7S3		
			G□-□9S3			
Exterior	Figure 1	Figure 2	Figure 3			



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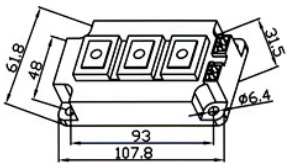

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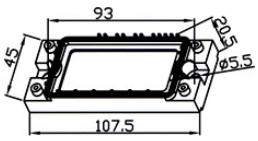
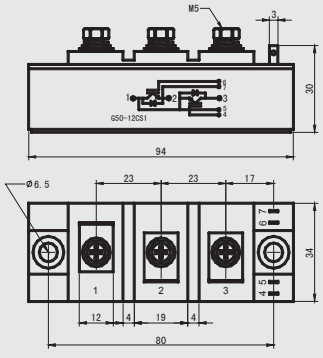


③

Characteristic

- SPT:Soft-punch-through technologe
- VCE(sat)with positivetemperature coefficient
- Lower on-state and switching loss
- Hight short circuit capability
- “vacuum+H2+H” process gasatmosphere,Nearly voidlesssoldering results1234567

Dimensions



G50-12CS1 Technical details

Characteristic values

	Symbol	Conditions	values			Unit
IGBT						
Collector-emitter voltage	VCES		1200			V
DC-collector current	IC	Tc=25(85)℃		75(50)		A
repetitive peak voltage	ICRM	Tc=25(80)℃, tp=1ms		150(100)		A
gate-emitter peak voltage	VGES		±20			V
operation temperature	Tvj		-40~+125			℃
storage temperature	Tstg		-40~+150			℃
insulation test voltage	VISOL	RMS, 1min, 50Hz	2500			V
Inverse diode						
DC-forward current	IF	Tc=25(80)℃	75 (50)			A
repetitive peak forward voltage	IFRM	Tc=25(80)℃, tp=1ms	150 (100)			A
forward surge current	IFSM	tp=10ms, sin, Tj=150℃	500			A

Characteristic values

Paramiter	Symbol	Conditions	values			IGBT
			typ.	typ.	max.	
IGBT						
gate threshold voltage	VGE(th)	VGE=VCE, IC=2mA,Tj=25℃	4.5	5.5	6.5	V
collector-emitter cut-off current	ICES	VGe=0V, Vce=VCES, Tj=25(125)℃		0.1	0.3	mA
gate-leakage current	IGES	VGE=0V, VGE=20V, Tj=25℃	-200		200	nA
collector-emitter threshold voltage	VCE (TO)	Tj=25 (125)℃		1(0.9)	1.15(1.05)	V
collector-emitter threshold voltage	rCE	VGE=15V, Tj=25 (125)℃		18(24)	24(30)	mΩ
collector-emitter saturation votage	VCE(SAT)	IC=50A, VGE=15V, chip level		1.9 (2.1)	2.35 (2.55)	V
input capacitance	Cies	VGE=0, VCE=25V, f=1MHZ		4.5		nF
output capacitance	Coes			0.6		nF
Reverse transfer capacitance	Cres			0.55		nF
stray inductance module	LCE				25	nH
module lead resistance	RCC'+EE'	terminals-chip, Tc=25 (125)℃	0.75 (1)			mΩ
Short circuit current	Isc	tpsc≤1s, VGE=15V, TVj=125℃, VCC=900V, VCEM≤1200V	280			A
turen on delay time	td (on)	VCC=600V, Ic=50A Rgon=Rgoff=15 Tj=125℃, VGE=±15V	90			ns
rise time	tr		55			ns
turn off delay time	td (off)		440			ns
fall time	tf		40			ns
turn-on energy loss per pules	Eon		5.7			mj
turn-off energy loss per pulse	Eoff		4.7			mj
Inverse diode						
forward voltage	VF	IF=50A, VGE=0V; Tj=25(125)℃		2(1.8)	2.5(1.9)	V
threshold voltage of diode	V(TO)	Tj=25(125)≡		1.1	1.2	V
peak reverse recovery current	IRRM	IF=50A, VGE=0, diF/dt=900A/us, Tj=125, VR=600V	40			A
Reverse recovered time	trr		400			nS
Thermal properties						
Thermal resistance, junction to case	Rth(j-c)	per IGBT	0.3			K/W
	Rth(j-c)D	per inverse diode	0.65			K/W
Thermal resistance, case to heat sink	Rth(c-s)	per module	0.05			K/W
Mechanical properties						
mounting torque	M1	M6	3		5	NM
terminal connection tord	M2	M5	2.5		5	NM
weight	MAX	176				g
Case color		white				K/W
Dimensions	MAX	94x3430.5				mm

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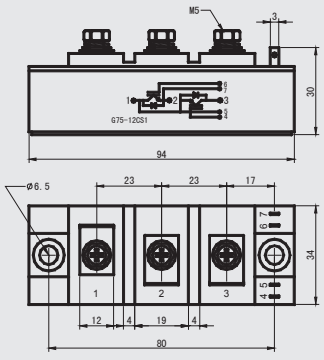
Characteristic

- SPT:Soft-punch-through technologe
- VCE(sat)with positivetemperature coefficient
- Lower on-state and switching loss
- Hight short circuit capability
- “vacuum+H2+H” process gasatmosphere,Nearly voidlesssoldering results1234567

Dimensions



G75-12CS1 Technical Details

Maximum rated values

	Symbol	Conditions	values	Unit
IGBT				
Collector-emitter voltage	VCES		1200	V
DC-collector current	IC	T_C=25(85)℃	75(50)	A
repetitive peak voltage	ICRM	T_C=25(80)℃, tp=1ms	200(150)	A
gate-emitter peak voltage	VGES		±20	V
operation temperature	Tvj		-40~+125	℃
storage temperature	Tstg		-40~+150	℃
insulation test voltage	VISOL	RMS, 1min, 50Hz	2500	V
Inverse diode				
DC-forward current	IF	Tc=25(80)℃	100 (75)	A
repetitive peak forward voltage	IFRM	Tc=25(80)℃, tp=1ms	200 (150)	A
forward surge current	IFSM	tp=10ms, sin, Tj=150℃	700	A

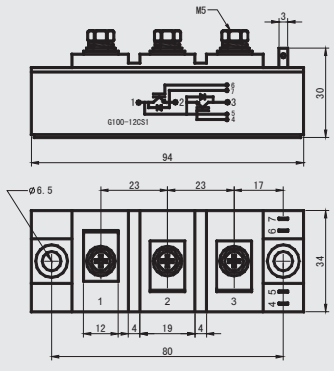
Characteristic values

Paramiter	Symbol	Conditions	values typ.	values typ.	values max.	IGBT
IGBT						
gate threshold voltage	VGE(th)	V_{GE}=V_{CE}, I_C=3mA,Tj=25℃	4.5	5.5	6.5	V
collector-emitter cut-off current	ICES	V_{Ge}=0V, V_{ce}=V_{CES}, T_j=25(125)℃		0.1	0.3	mA
gate-leakage current	IGES	V_{GE}=0V, VGE=20V, T_j=25℃	-200		200	nA
collector-emitter threshold voltage	VCE (TO)	T_j=25 (125)℃		1(0.9)	1.15(1.05)	V
collector-emitter threshold voltage	rCE	V_{GE}=15V, T_j=25 (125)℃	13(16)		16(20)	mΩ
collector-emitter saturation votage	VCE(SAT)	I_C=75 A, V_{GE}=15V, chip level	1.9 (2.1)		2.35 (2.55)	V
input capacitance	Cies	V_{GE}=0, V_{CE}=25V, f=1MHZ		6.2		nF
output capacitance	Coes			0.74		nF
Reverse transfer capacitance	Cres			0.71		nF
stray inductance module	LCE				25	nH
module lead resistance	RCC'+EE'	terminals-chip, Tc=25 (125)℃	0.75 (1)			mΩ
Short circuit current	I_{SC}	tpsc≤10s, VGE=15V, TVj=125℃, VCC=900V, VCEM≤1200V	420			A
turen on delay time	td (on)	V_{CC}=600V, Ic=70A Rgon=Rgoff=12 T_j=125℃, V_{GE}=±15V	150			ns
rise time	tr		45			ns
turn off delay time	td (off)		560			ns
fall time	tf		50			ns
turn-on energy loss per pules	Eon		8.5			mj
turn-off energy loss per pulse	Eoff		7.5			mj
Inverse diode						
forward voltage	VF	I_F=75A, V_{GE}=0V; Tj=25(125)℃		2(1.8)	2.5(1.9)	V
threshold voltage of diode	V(TO)	Tj=25(125)≡		1.1	1.2	V
peak reverse recovery current	I_{RRM}	I_F=75A, V_{GE}=0, diF/dt=600A/us, T_j=125, V_R=600V	62			A
Reverse recovered time	trr		200			nS
Thermal properties						
Thermal resistance, junction to case	Rth(j-c)	per IGBT	0.2			K/W
	Rth(j-c)D	per inverse diode	0.5			K/W
Thermal resistance, case to heat sink	Rth(c-s)	per module	0.05			K/W
Mechanical properties						
mounting torque	M1	M6	3		5	NM
terminal connection tord	M2	M5	2.5		5	NM
weight	MAX	176				g
Case color		white				K/W
Dimensions	MAX	94x3430.5				mm

Characteristic

- SPT:Soft-punch-through technologe
- VCE(sat)with positivetemperature coefficient
- Lower on-state and switching loss
- Hight short circuit capability
- “vacuum+H2+H” process

Dimensions



G100-12CS1 Technical Details

Maximum rated values

	Symbol	Conditions	values	Unit
IGBT				
Collector-emitter voltage	VCES		1200	V
DC-collector current	IC	Tc=25(85)℃	150(100)	A
repetitive peak voltage	ICRM	Tc=25(80)℃, tp=1ms	300(200)	A
gate-emitter peak voltage	VGES		±20	V
operation temperature	Tvj		-40~+125	℃
storage temperature	Tstg		-40~+150	℃
insulation test voltage	VISOL	RMS, 1min, 50Hz	2500	V
Inverse diode				
DC-forward current	IF	Tc=25(80)℃	150 (95)	A
repetitive peak forward voltage	IFRM	Tc=25(80)℃, tp=1ms	300 (190)	A
forward surge current	IFSM	tp=10ms, sin, Tj=150℃	1000	A

Characteristic values

Paramiter	Symbol	Conditions	values			IGBT
			typ.	typ.	max.	
IGBT						
gate threshold voltage	VGE(th)	VGE=VCE, IC=4mA,Tj=25℃	4.5	5.5	6.5	V
collector-emitter cut-off current	ICES	VGe=0V, Vce=VCES, Tj=25(125)℃		0.1	0.3	mA
gate-leakage current	IGES	VGE=0V, VGE=20V, Tj=25℃	-200		200	nA
collector-emitter threshold voltage	VCE (TO)	Tj=25 (125)℃	1(0.9)		1.15(1.05)	V
collector-emitter threshold voltage	rCE	VGE=15V, Tj=25 (125)℃	9(12)		12(15)	mΩ
collector-emitter saturation votage	VCE(SAT)	IC=75 A, VGE=15V, chip level	1.9 (2.1)		2.35 (2.55)	V
input capacitance	Cies	VGE=0, VCE=25V, f=1MHZ		9		nF
output capacitance	Coes			1		nF
Reverse transfer capacitance	Cres			1		nF
stray inductance module	LCE				25	nH
module lead resistance	RCC'+EE'	terminals-chip, Tc=25 (125)℃	0.75 (1)			mΩ
Short circuit current	Isc	tpsc≤10s, VGE=15V, TVj=125℃, VCC=900V, VCEM≤1200V	470			A
turen on delay time	td (on)	VCC=600V, Ic=100A Rgon=Rgoff=12 Tj=125℃, VGE=±15V	190			ns
rise time	tr		50			ns
turn off delay time	td (off)		590			ns
fall time	tf		50			ns
turn-on energy loss per pules	Eon		11.5			mj
turn-off energy loss per pulse	Eoff		9.5			mj
Inverse diode						
forward voltage	VF	IF=100A, VGE=0V; Tj=25(125)℃		2.3(1.9)	2.55(2.0)	V
threshold voltage of diode	V(TO)	Tj=25(125)≡		1.1	1.2	V
peak reverse recovery current	IRRM	IF=100A, VGE=0, diF/dt=600A/us, Tj=125, VR=600V	62			A
Reverse recovered time	trr		200			nS
Thermal properties						
Thermal resistance, junction to case	Rth(j-c)	per IGBT	0.17			K/W
	Rth(j-c)D	per inverse diode	0.45			K/W
Thermal resistance, case to heat sink	Rth(c-s)	per module	0.05			K/W
Mechanical properties						
mounting torque	M1	M6	3		5	NM
terminal connection tord	M2	M5	2.5		5	NM
weight	MAX	176				g
Case color		white				K/W
Dimensions	MAX	94x3430.5				mm

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