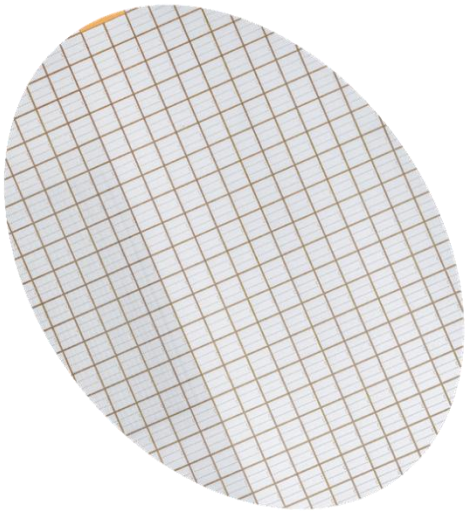
DATASHEET

SIS0150C120i23

I23 micro pattern IGBT, 10.1 mm x 9.9 mm



V_{CE} = 1200 V
I_C = 150 A

- *i23* ultra-low-loss micro pattern Trench IGBT chip-set
- Soft switching for a broad application range due to best turn-off controllability
- positive temperature coefficient
- easy paralleling

Maximum ratings[1]

PARAMETER	SYMBOL	CONDITIONS	MIN	MAX	UNIT
Collector-emitter voltage	V_{CES}	V_{GE} = 0 V, T_{vj} ≥ 25 °C		1200	V
DC collector current	I_C			150	A
Peak collector current	I_{CM}	t_p limited by $T_{vj\,max}$ $T_{vj\,max}$		300	A
Gate-emitter voltage	V_{GES}		-20	20	V
Junction temperature	T_{vj}		-40	175	°C
Junction operating temperature	$T_{vj(op)}$		-40	175	°C
Short circuit[2]	t_{sc}	V_{GE} = 15V, V_{CC} = 800V, T_{vj} = 175°C[3]		8	µs

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[1] Maximum rated values indicate limits beyond which damage to the device may occur per IEC 60747
[2] Not subject to production test, capability depending on module design
[3] Short circuit performance at high temperature requires suitable die assembly process

IGBT[4]

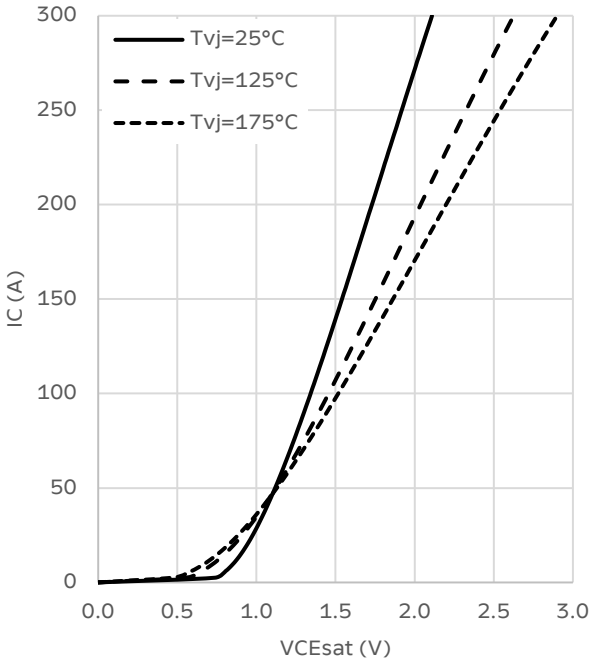
PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Collector(-emitter) breakdown voltage	$V_{(BR)CES}$	V_{GE} = 0 V, I_C = 0.25 mA, T_{vj} = 25 °C		1200			V
Collector-emitter saturation voltage [5]	V_{CEsat}	I_c = 150 A, V_{GE} = 15 V	T_{vj} = 25 °C		1.55		V
			T_{vj} = 125 °C		1.80		V
			T_{vj} = 175 °C		1.85		V
Collector cut-off current	I_{CES}	V_{CE} = 1200 V, V_{GE} = 0 V	T_{vj} = 25 °C			1	µA
Gate leakage current	I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V		-0.1		0.1	µA
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C = 7.5 mA, V_{CE} = V_{GE}, T_{vj} = 25°C			6.3		V
Gate charge	Q_G	I_C = 150 A, V_{CE} = 600 V, V_{GE} = -15 V. 15 V			1.33		µC
Input capacitance	C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 100 kHz, T_{vj} = 25 °C			20.4		nF
Output capacitance	C_{oes}				460		pF
Reverse tansfer capacitance	C_{res}				190		pF
Internal gate resistor	R_{Gint}	Per switch			2.6		Ω
Turn-on delay time	$t_{d(on)}$	V_{CC} = 600 V, I_C = 150 A, R_G = 3.0 Ω, V_{GE} = ± 15 V	T_{vj} = 25 °C		195		ns
			T_{vj} = 125 °C		215		ns
			T_{vj} = 175 °C		220		ns
Rise time	t_r		T_{vj} = 25 °C		65		ns
			T_{vj} = 125 °C		70		ns
			T_{vj} = 175 °C		80		ns
Turn-off delay time	$t_{d(off)}$	V_{CC} = 600 V, I_C = 150 A, R_G = 3.0 Ω, V_{GE} = ± 15 V	T_{vj} = 25 °C		160		ns
			T_{vj} = 125 °C		200		ns
			T_{vj} = 175 °C		250		ns
Fall time	t_f		T_{vj} = 25 °C		380		ns
			T_{vj} = 125 °C		510		ns
			T_{vj} = 175 °C		530		ns
Turn-on switching energy	E_{on}	V_{CC} = 600 V, I_C = 150 A, R_G = 3.0 Ω, V_{GE} = ± 15 V Diode: SID0150C120d20	T_{vj} = 25 °C		17.5		mJ
			T_{vj} = 125 °C		22		mJ
			T_{vj} = 175 °C		25		mJ
Turn-off switching energy	E_{off}	V_{CC} = 600 V, I_C = 150 A, R_G = 3 Ω, V_{GE} = ± 15 V	T_{vj} = 25 °C		14		mJ
			T_{vj} = 125 °C		19		mJ
			T_{vj} = 175 °C		21		mJ
Short circuit current	I_{SC}	t_{pcs} ≤ 8 µs, V_{GE} = 15 V, T_{vj} = 175 °C, V_{CC} = 800 V, $v_{CEM\ Chip}$ ≤ 1200 V			815		A

[4] Characteristic values according to IEC 60747-9

Characteristics

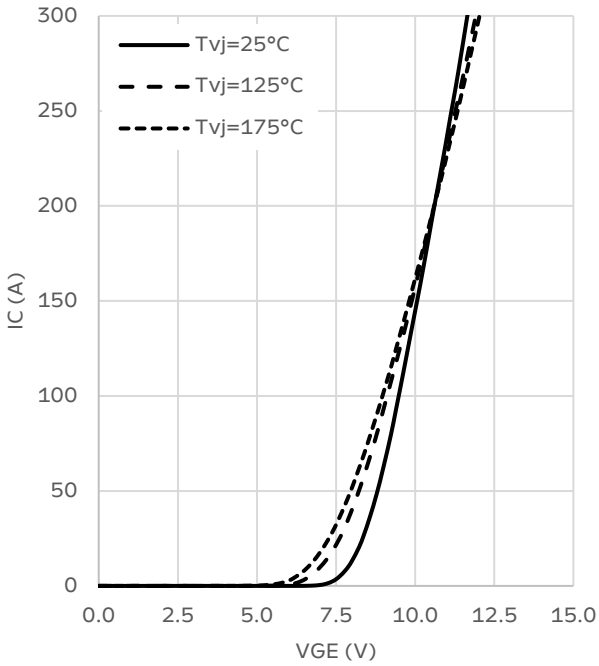
IGBT on-state characteristics (typical)

$I_C = f(V_{CE})$
V_{GE} = 15 V



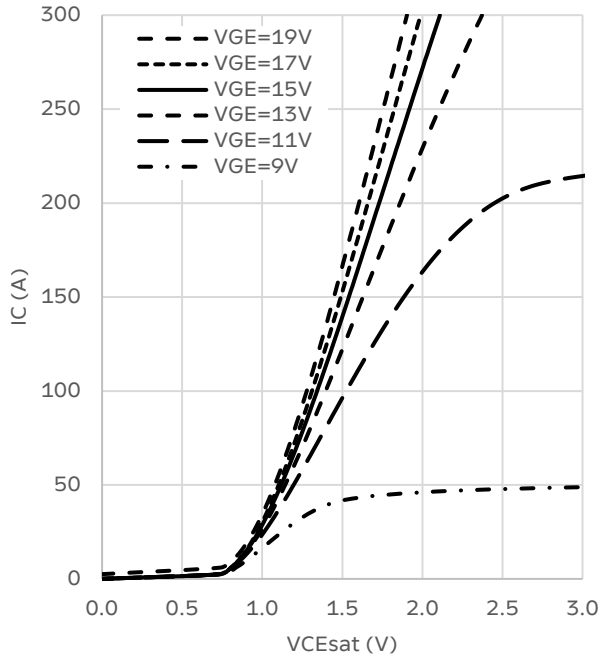
IGBT transfer characteristics (typical)

$I_C = f(V_{GE})$
V_{CE} = 20V



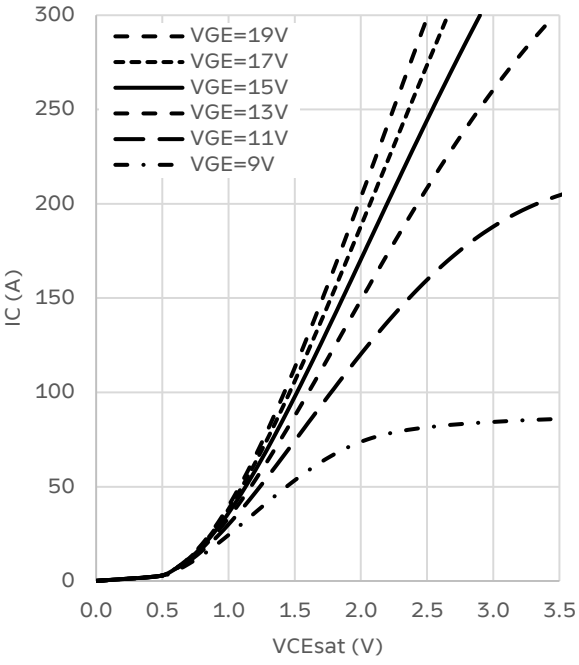
IGBT output characteristics (typical)

$I_C = f(V_{CE})$
T_{vj} = 25 °C



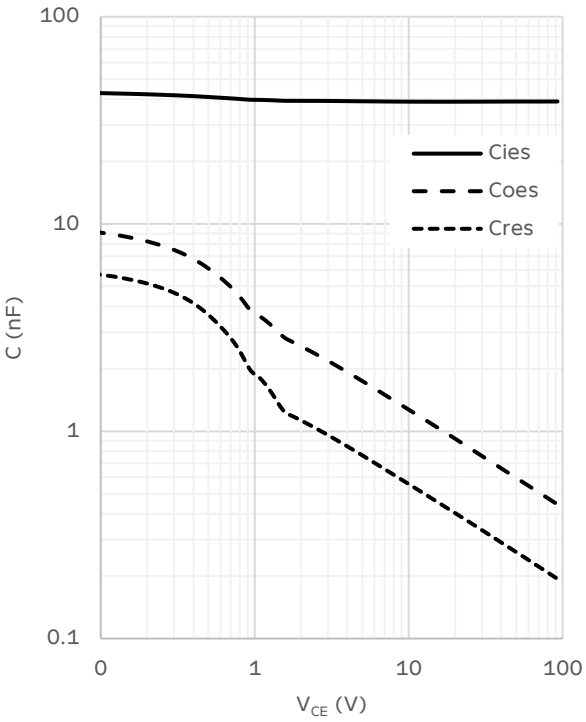
IGBT output characteristics (typical)

$I_C = f(V_{CE})$
T_{vj} = 175 °C



IGBT Capacitance characteristics (typical)

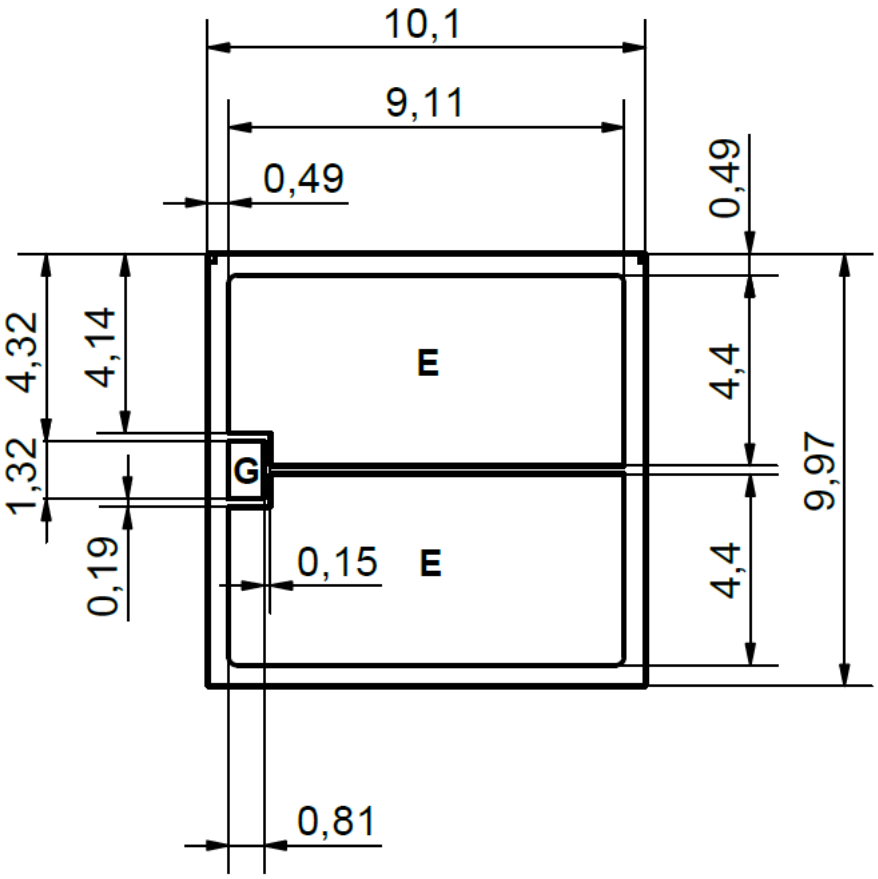
$C = f(V_{CE})$, $T_{vj} = 25$ °C
$f = 100$ kHz, $V_{GE} = 0$ V



Mechanical properties

PARAMETER		UNIT
Die size	(10.1± 0.01) x (9.97± 0.01)	mm^2
Gate pad size	1.32 x 0.81	mm^2
Thickness	135± 5	µm
Wafer diameter	300	mm
Maximum chips per wafer	605	pcs
Frontside passivation	Polyimide	
Frontside metal (pads)	Al Cu, 5000nm	
Backside metal	Al Ni Ag System, 1100nm	

Chip drawing



This is an electrostatic sensitive device.

Ordering Information

Part Number	SIS0150C120i23
Package	Bare Die
Packaging Method	Wafer