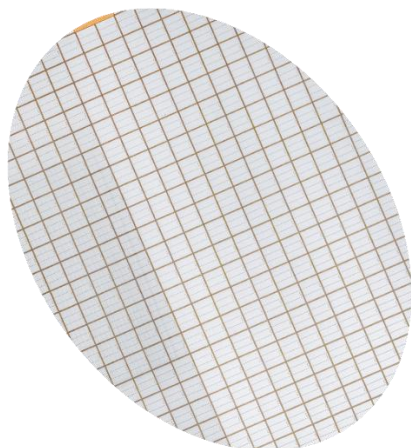


SIS0200C170i23

i23 LCT micropattern trench IGBT, 11.6 mm x 12.4 mm

 **$V_{CE} = 1700\text{ V}$** **$I_C = 200\text{ A}$**

- 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 ratings¹

PARAMETER	SYMBOL	CONDITIONS	MIN	MAX	UNIT
Collector-emitter voltage	V_{CES}	$V_{GE} = 0\text{ V}$, $T_{vj} \geq 25\text{ °C}$		1700	V
DC collector current	I_C			200	A
Peak collector current	I_{CM}	t_p limited by $T_{vj\text{ max}}$ $T_{vj\text{ max}}$		400	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}	$V_{GE} = 15\text{ V}$, $V_{CC} = 1100\text{ V}$, $T_{vj} = 175\text{ °C}$ ³		6	μs

¹ Maximum rated values indicate limits beyond which damage to the device may occur per IEC 60747² Not subject to production test, capability depending on module design³ Short circuit performance at high temperature requires suitable die assembly process



IGBT⁴

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Collector(-emitter) breakdown voltage	$V_{(BR)CES}$	$V_{GE} = 0 \text{ V}$, $I_C = 0.15 \text{ mA}$, $T_{vj} = 25 \text{ °C}$	1700			V
Collector-emitter saturation voltage ⁵	V_{CESat}	$I_C = 200 \text{ A}$, $V_{GE} = 15 \text{ V}$	$T_{vj} = 25 \text{ °C}$	1.7		V
			$T_{vj} = 125 \text{ °C}$	1.95		V
			$T_{vj} = 175 \text{ °C}$	2.2		V
Collector cut-off current	I_{CES}	$V_{CE} = 1700 \text{ V}$, $V_{GE} = 0 \text{ V}$			1.0	μA
Gate leakage current	I_{GES}	$V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$	-0.5		0.5	μA
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C = 6.7 \text{ mA}$, $V_{CE} = V_{GE}$, $T_{vj} = 25 \text{ °C}$		6.0		V
Gate charge	Q_G	$I_C = 200 \text{ A}$, $V_{CE} = 900 \text{ V}$, $V_{GE} = -15 \text{ V} \dots 15 \text{ V}$		1.7		μC
Input capacitance	C_{ies}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$, $T_{vj} = 25 \text{ °C}$		25		nF
Output capacitance	C_{oes}			411		pF
Reverse transfer capacitance	C_{res}			174		pF
Internal gate resistor	R_{Gint}	Per switch		2.3		Ω
Turn-on delay time	$t_{d(on)}$	$V_{CC} = 900 \text{ V}$, $I_C = 200 \text{ A}$, $R_G = 1.5 \text{ }\Omega$, $V_{GE} = \pm 15 \text{ V}$	$T_{vj} = 25 \text{ °C}$	170		ns
			$T_{vj} = 125 \text{ °C}$	195		ns
			$T_{vj} = 175 \text{ °C}$	215		ns
Rise time	t_r		$T_{vj} = 25 \text{ °C}$	70		ns
			$T_{vj} = 125 \text{ °C}$	80		ns
			$T_{vj} = 175 \text{ °C}$	95		ns
Turn-off delay time	$t_{d(off)}$	$V_{CC} = 900 \text{ V}$, $I_C = 200 \text{ A}$, $R_G = 5 \text{ }\Omega$, $V_{GE} = \pm 15 \text{ V}$	$T_{vj} = 25 \text{ °C}$	395		ns
			$T_{vj} = 125 \text{ °C}$	495		ns
			$T_{vj} = 175 \text{ °C}$	530		ns
Fall time	t_f		$T_{vj} = 25 \text{ °C}$	425		ns
			$T_{vj} = 125 \text{ °C}$	580		ns
			$T_{vj} = 175 \text{ °C}$	650		ns
Turn-on switching energy	E_{on}	$V_{CC} = 900 \text{ V}$, $I_C = 200 \text{ A}$, $R_G = 1.5 \text{ }\Omega$, $V_{GE} = \pm 15 \text{ V}$ Diode: SID0200C170d23	$T_{vj} = 25 \text{ °C}$	33		mJ
			$T_{vj} = 125 \text{ °C}$	41		mJ
			$T_{vj} = 175 \text{ °C}$	48		mJ
Turn-off switching energy	E_{off}	$V_{CC} = 900 \text{ V}$, $I_C = 200 \text{ A}$, $R_G = 5 \text{ }\Omega$, $V_{GE} = \pm 15 \text{ V}$	$T_{vj} = 25 \text{ °C}$	41		mJ
			$T_{vj} = 125 \text{ °C}$	52		mJ
			$T_{vj} = 175 \text{ °C}$	64		mJ
Short circuit current	I_{SC}	$t_{pCS} \leq 6 \text{ }\mu\text{s}$, $V_{GE} = 15 \text{ V}$, $T_{vj} = 175 \text{ °C}$, $V_{CC} = 1100 \text{ V}$, $V_{CEM \text{ Chip}} \leq 1700 \text{ V}$		950		A

⁴ Characteristic values according to IEC 60747-9

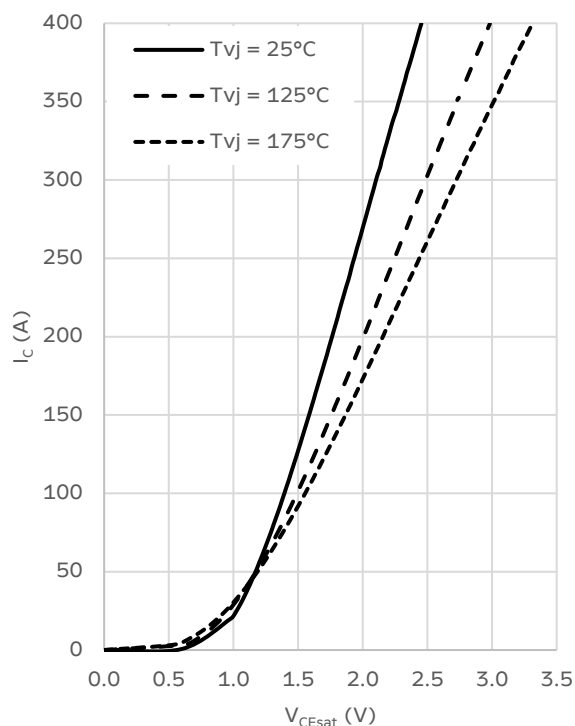


Characteristics

IGBT on-state characteristics (typical)

$I_C = f(V_{CE})$

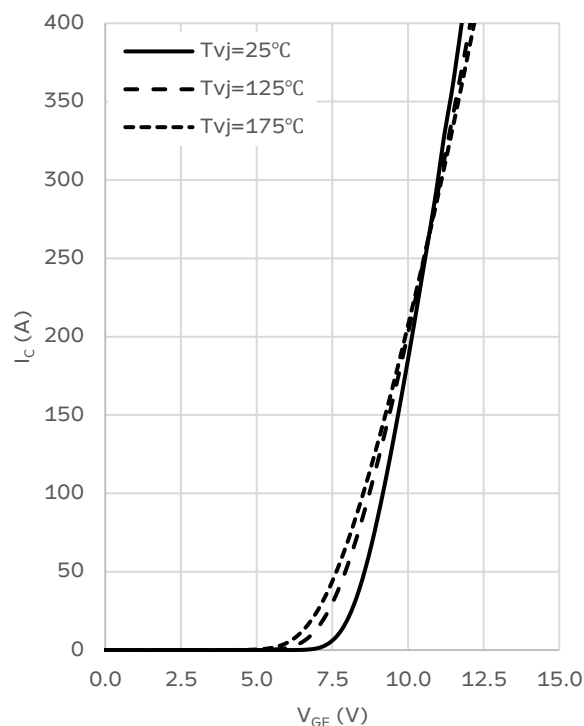
$V_{GE} = 15\text{ V}$



IGBT transfer characteristics (typical)

$I_C = f(V_{GE})$

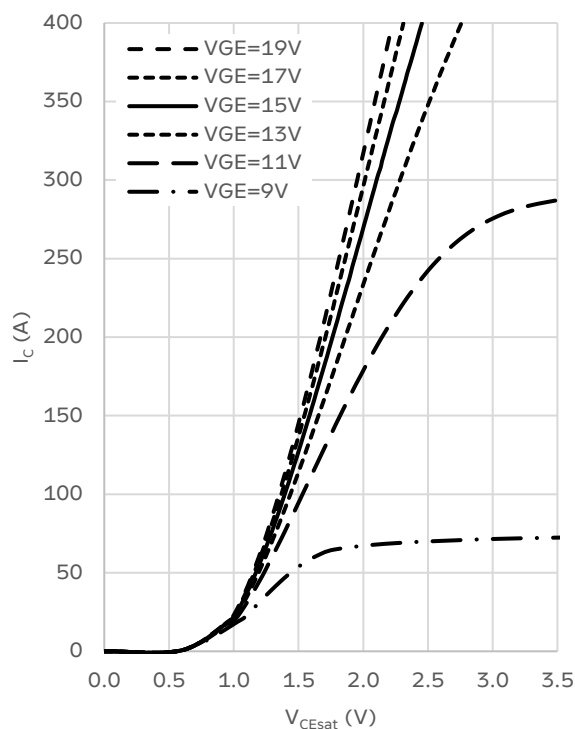
$V_{CE} = 20\text{ V}$



IGBT output characteristics (typical)

$I_C = f(V_{CE})$

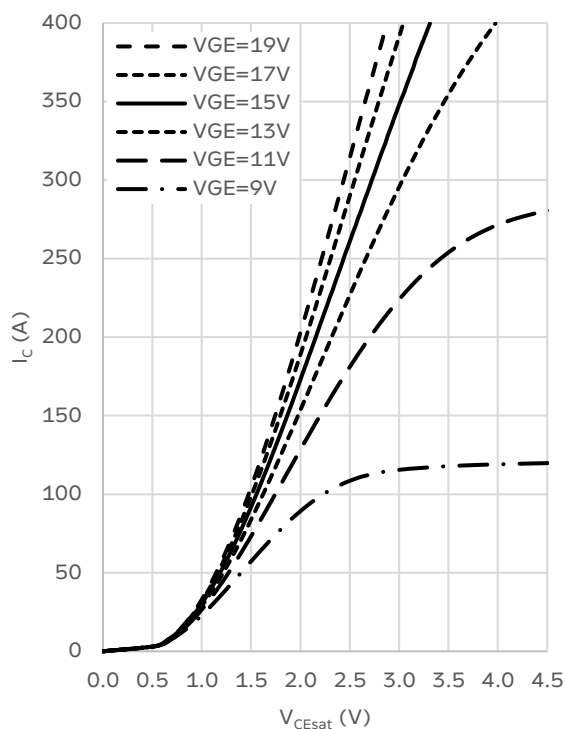
$T_{vj} = 25^\circ\text{C}$



IGBT output characteristics (typical)

$I_C = f(V_{CE})$

$T_{vj} = 175^\circ\text{C}$

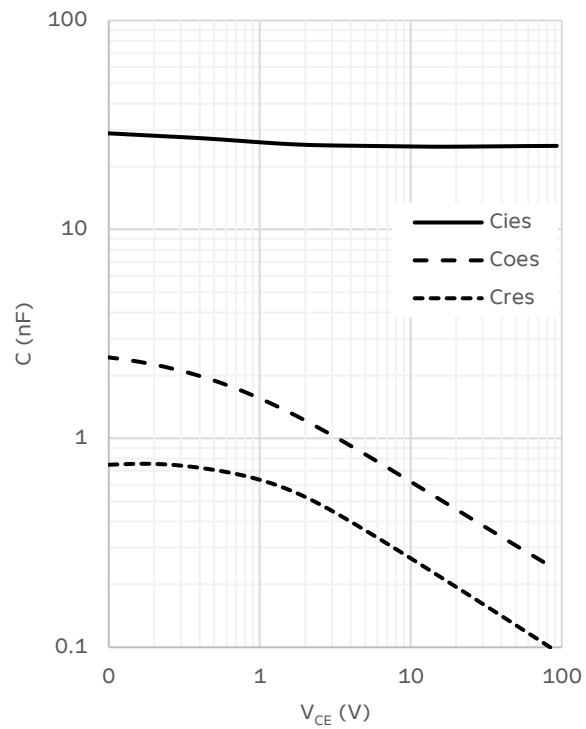




IGBT Capacitance characteristics (typical)

$C = f(V_{CE})$, $T_{vj} = 25\text{ °C}$

$f = 100\text{ kHz}$, $V_{GE} = 0\text{ V}$

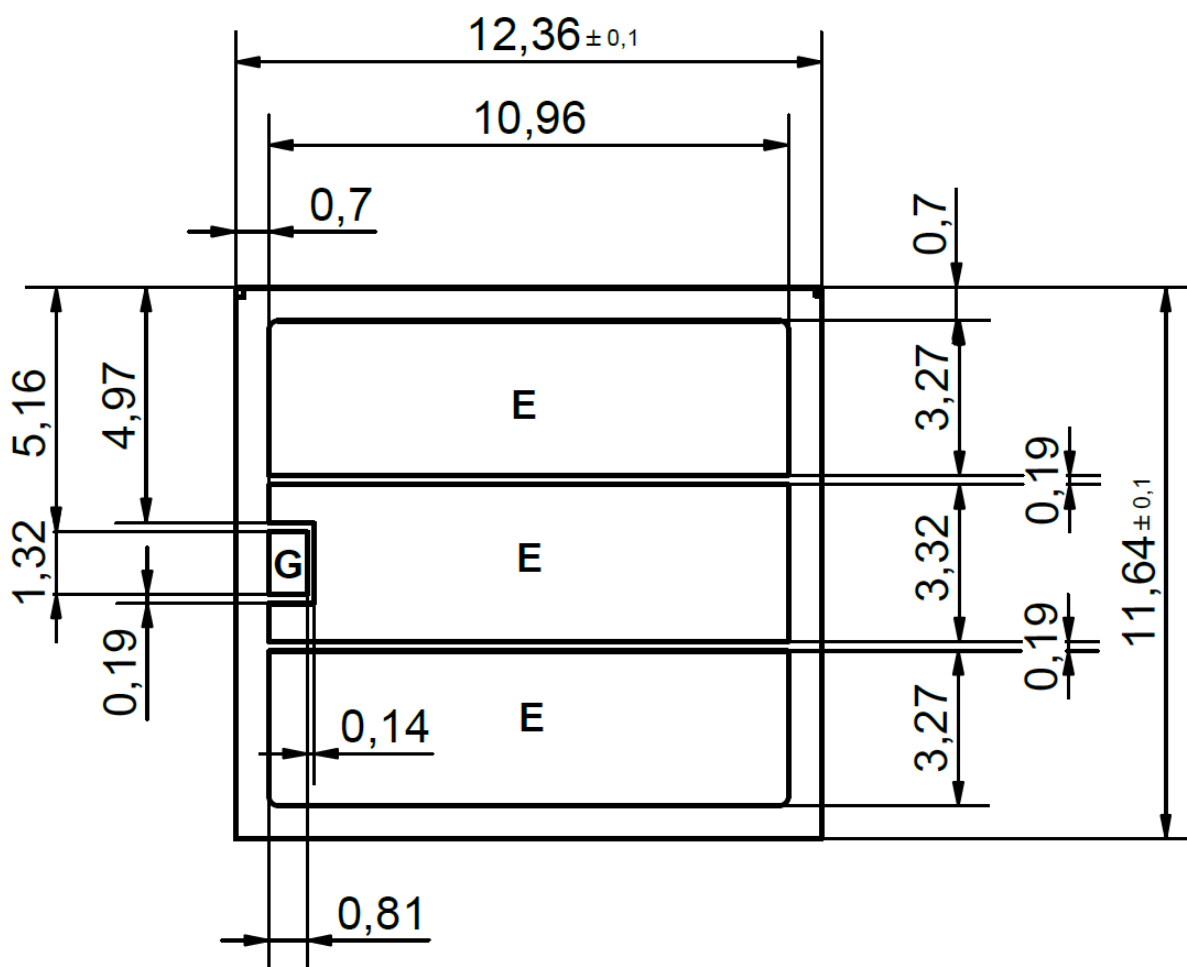




Mechanical properties⁶

PARAMETER		UNIT
Die size	$(11.64 \pm 0.01) \times (12.36 \pm 0.01)$	mm ²
Gate pad size	1.3 x 0.8	mm ²
Thickness	175 ± 5	µm
Wafer diameter	300	mm
Maximum chips per wafer	417	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

OPTION		ARTICLE NUMBER
Packaging Method	Sawn on tape (_O10)	SIS0200C170i23_ O10
	Wafer unsawn (_O20)	SIS0200C170i23_ O20
	Waffle pack (_O30)	SIS0200C170i23_ O30