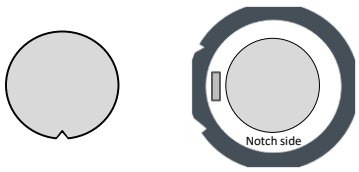
SG8412WN

1200V 150A Insulated Gate Bipolar Transistor Datasheet

V_{CES}	1200V
$I_{C\ (Nominal)}$	150A
$V_{CE(sat)}$ (Typ.)	1.55V
Max. Possible Chips per Wafer	192pcs

●Outline

Wafer (W05) Unsawn on foil (U03)



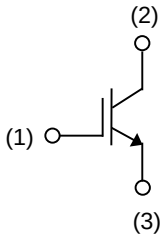
●Features

1) Trench Light Punch Through Type

2) Low Collector - Emitter Saturation Voltage

3) Short Circuit Withstand Time 10μs

●Inner Circuit



(1) Gate
(2) Collector
(3) Emitter

●Application

General Inverter

for Automotive and Industrial Use

Heater for Automotive

Exciter for Automotive

●Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Collector - Emitter Voltage, T_j = 25°C	V_{CES}	1200	V
Gate - Emitter Voltage	V_{GES}	±30	V
Collector Current	I_C *1	*1)	A
Pulsed Collector Current	I_{CP} *2	450	A
Operating Junction Temperature	T_j	-40 to +175	°C

*1 Depending on thermal properties of assembly

*2 Pulse width limited by $T_{jmax.}$

●Design Assurance

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Short Circuit Withstand Time	t_{sc} *3	V_{GE} = 15V, T_j = 25°C				μs
		V_{CC} ≤ 800V	10	-	-	
		V_{CC} ≤ 850V	9	-	-	
Short Circuit Withstand Time	t_{sc} *3	V_{GE} = 15V, T_j = 150°C				μs
		V_{CC} ≤ 800V	8	-	-	
		V_{CC} ≤ 850V	7	-	-	
Reverse Bias Safe Operating Area	RBSOA*3	I_C = 450A,V_{CC} = 940V, V_P = 1200V,V_{GE} = 15V, R_G = 50Ω,T_j = 175°C	FULL SQUARE			-

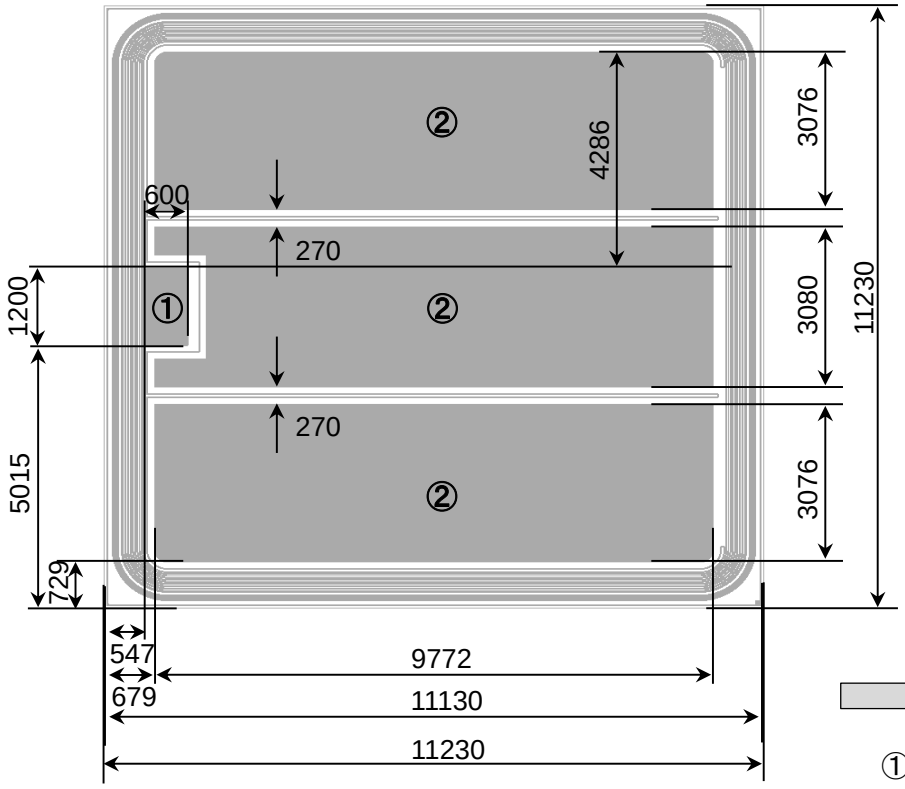
*3 Design assurance without measurement

●Electrical Characteristics (at T_j = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Collector - Emitter Breakdown Voltage	BV_{CES}	I_C = 10μA, V_{GE} = 0V	1200	-	-	V
Collector Cut - off Current	I_{CES}	V_{CE} = 1200V, V_{GE} = 0V	-	-	10	μA
Gate - Emitter Leakage Current	I_{GES}	V_{GE} = ±30V, V_{CE} = 0V	-	-	±500	nA
Gate - Emitter Threshold Voltage	$V_{GE(th)}$	V_{CE} = 5V, I_C = 17.7mA	5.5	6.3	7.1	V
Collector - Emitter Saturation Voltage	$V_{CE(sat)}$ *3	I_C = 150A, V_{GE} = 15V,				V
		T_j = 25°C	-	1.55	1.95	
		T_j = 150°C	-	1.95	-	
Input Capacitance	C_{ies}	V_{CE} = 30V,	-	24935	-	pF
Output Capacitance	C_{oes}	V_{GE} = 0V,	-	566	-	
Reverse transfer Capacitance	C_{res}	f = 1MHz	-	209	-	
Total Gate Charge	Q_g	V_{CE} = 600V,	-	906	-	nC
Gate - Emitter Charge	Q_{ge}	I_C = 150A,	-	167	-	
Gate - Collector Charge	Q_{gc}	V_{GE} = 15V	-	515	-	
Gate Input Resistance	$R_{G(int)}$	f = 1MHz, open collector	-	0.4	-	Ω
Integrated Gate Resistor	R_G	f = 1MHz, open collector	-	None	-	Ω

*3 Design assurance without measurement

●Chip Information



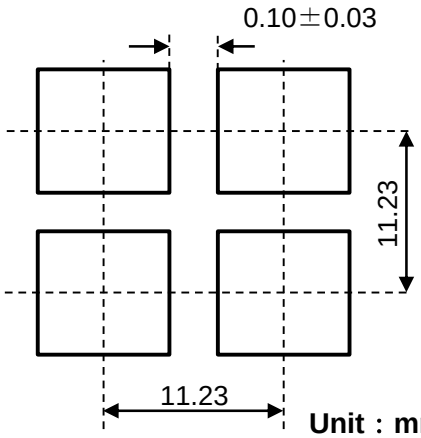
Unit : μm

: Pad Area

① : Gate Bonding Pad

② : Emitter Bonding Pad

Backside : Collector



Unit : mm

Wafer Size	200mm
Wafer Thickness	0.13±0.01mm
Chip Size	11.23mm×11.23mm
Cut Line Width	0.10±0.03mm
Top Side Metallization	AlCu:4.4μm
Back Side Metallization	Ti/Ni:0.4μm/Au:0.05μm
Passivation	Polyimide
Active Area Total	96.37mm^2

●Further Electrical Characteristics

Switching characteristics and thermal properties are depending strongly on module design and mounting technology and can therefore not be specified for a bare die.

This chip data sheet refers to the device data sheet	-

Technology planning to qualify in TO-247-4L package.

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