SG8359WN

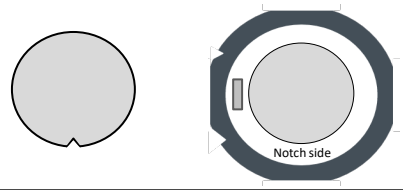
650V 40A Insulated Gate Bipolar Transistor

Datasheet

V_{CES}	650V
$I_{C\ (Nominal)}$	40A
$V_{CE(sat)\ (Typ.)}$	1.55V
Max. Possible Chips per Wafer	1754pcs

●Outline

Wafer (W05) Unsawn on foil (U03)



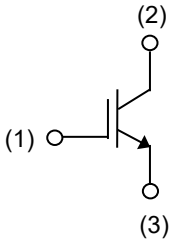
●Features

1) Trench Light Punch Through Type

2) Low Collector - Emitter Saturation Voltage

3) Short Circuit Withstand Time 7μs

●Inner Circuit



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

●Application

General Inverter

for Automotive and Industrial Use

Heater for Automotive

Relay Circuit (ex. Pre Charge Relay)

●Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Collector - Emitter Voltage, T_j = 25°C	V_{CES}	650	V
Gate - Emitter Voltage	V_{GES}	±30	V
Collector Current	I_C *1	*1)	A
Pulsed Collector Current	I_{CP} *2	120	A
Operating Junction Temperature	T_j	-40 to +175	°C

*1 Depending on thermal properties of assembly

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

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●Design Assurance

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Short Circuit Withstand Time	t_{sc} *3	V_{GE} = 15V, T_j = 25°C V_{CC} ≤ 360V V_{CC} ≤ 400V	 7 6.5	 - -	 - -	µs
Short Circuit Withstand Time	t_{sc} *3	V_{GE} = 15V, T_j = 150°C V_{CC} ≤ 400V	5	-	-	µs
Reverse Bias Safe Operating Area	RBSOA *3	I_C = 120A, V_{CC} = 550V, V_P = 650V, 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 = 1µA, V_{GE} = 0V	650	-	-	V
Collector Cut - off Current	I_{CES}	V_{CE} = 650V, V_{GE} = 0V	-	-	1	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 = 9.5mA	5.2	6.0	6.8	V
Collector - Emitter Saturation Voltage	$V_{CE(sat)}$ *3	I_C = 40A, V_{GE} = 15V, T_j = 25°C T_j = 150°C	 - -	 1.55 2.00	 1.85 -	V
Input Capacitance	C_{ies}	V_{CE} = 30V,	-	3033	-	pF
Output Capacitance	C_{oes}	V_{GE} = 0V,	-	72	-	
Reverse transfer Capacitance	C_{res}	f = 1MHz	-	28	-	
Total Gate Charge	Q_g	V_{CE} = 400V,	-	116	-	nC
Gate - Emitter Charge	Q_{ge}	I_C = 40A,	-	35	-	
Gate - Collector Charge	Q_{gc}	V_{GE} = 15V	-	47	-	

*3 Design assurance without measurement

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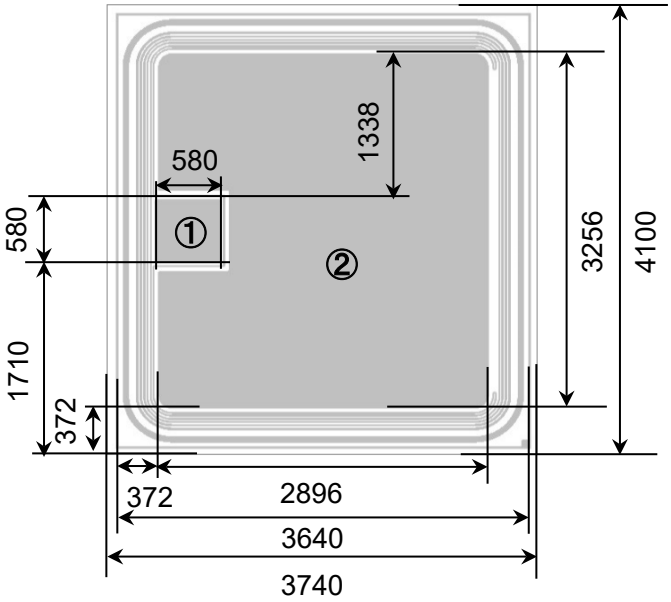
●Chip Information



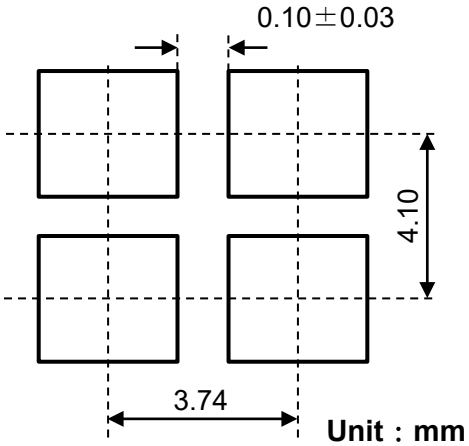
Unit : μm

: Pad Area

① : Gate Bonding Pad

② : Emitter Bonding Pad

Backside : Collector



Unit : mm

Wafer Size	200mm
Wafer Thickness	0.075±0.01mm
Chip Size	3.74mm×4.10mm
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	9.52mm^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	RGA80TR65

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

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