■ Features

- High Output Power: P_{sat}=55.0dBm (Typ.)
- High Gain: G_p=9.0dB (Typ.)
- High Power Added Efficiency: PAE=37% (Typ.)
- Broad Band: 9.8 to 10.5GHz
- Impedance Matched Zin/Zout = 50ohm
- Hermetically Sealed Package
- Long pulse operation *

*Reduced Vds and/or low case temperature are needed to keep Tch below 200 deg.C. Please contact for the detail.

■ Description

The SGC1011-300B-R is a high power GaN-HEMT that is internally matched for X-band radar bands to provide optimum power and gain in a 50ohm system.

The shipping items of SGC1011-300B-R/001 and SGC1011-300B-R/002 are different. Refer to the "order information" on page 4.

ABSOLUTE MAXIMUM RATING (Case Temperature T_c=25 deg.C)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	55	V
Gate-Source Voltage	V_{GS}	-15	V
Storage Temperature	T_{stg}	-55 to +125	deg.C
Channel Temperature	T_{ch}	+250	deg.C

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
Drain-Source Voltage	V_{DS}		<=50	V
Forward Gate Current	I_{GF}	Rg=10ohm	<=187.2	mA
Reverse Gate Current	I_{GR}	Rg=10ohm	>=-13.6	mA
Channel Temperature	T_{ch}		<+200	deg.C
Output Power	P_{out}		<=P5dB	dBm

ELECTRICAL CHARACTERISTICS (Case Temperature T_c=25 deg.C)

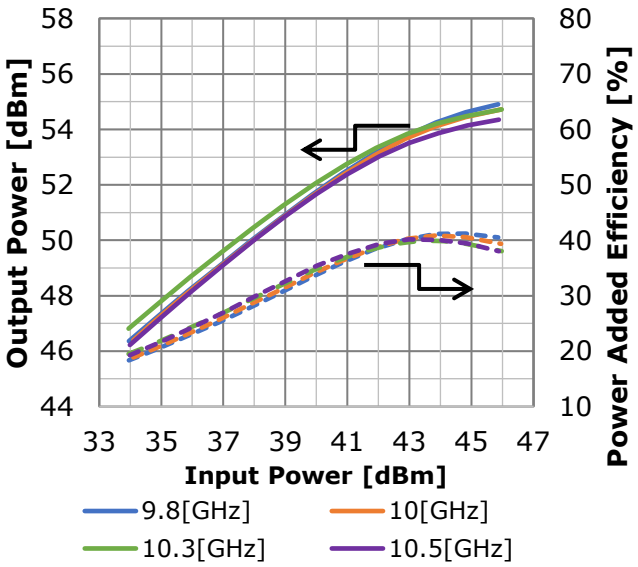
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-off Voltage	V_P	V_{DS}=50V, I_{DS}=20.0mA	-	-4.5	-	V
Frequency Range	Freq.	V_{DS}=50V $I_{DS(DC)}$=1.0A Pulse Width=100µsec. Duty=10% *1:f=9.8 to 10.3GHz *2:f=10.3 to 10.5GHz Pin=46dBm	9.8	-	10.5	GHz
Output Power *1	P_{sat}		54.0	55.0	-	dBm
Output Power *2	P_{sat}		53.4	54.4	-	dBm
Power Gain *1	G_P		8.0	9.0	-	dB
Power Gain *2	G_P		7.4	8.4	-	dB
Drain Current	I_{DSR}		-	14.9	18.9	A
Power Added Efficiency	PAE		-	37	-	%
Thermal Resistance	R_{th}	Channel to Case (P_{diss}=100W, CW)	-	0.7	0.8	deg.C/W

CASE STYLE	IK	
RoHS Compliance	YES	
ESD	Class 2	2000V to <4000V

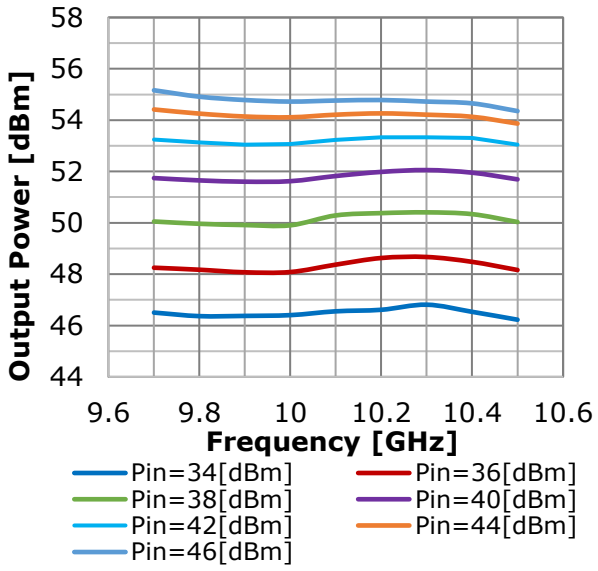
Note: Based on ANSI/ESDA/JEDEC JS-001(C=100pF, R=1.5kohm)

● RF Characteristics

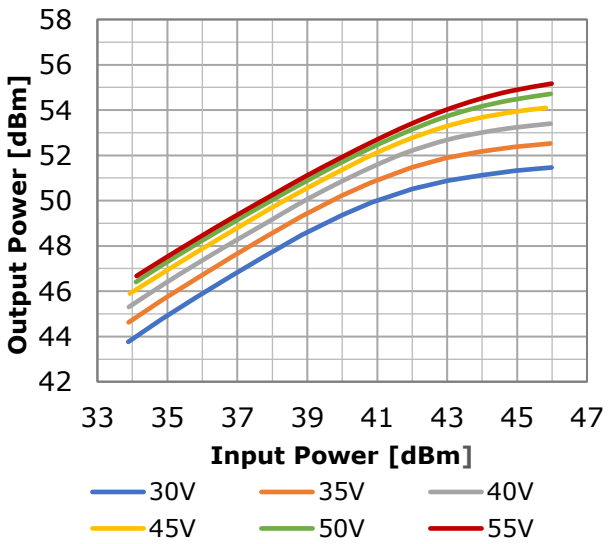
Output Power & Power Added Efficiency vs. Input Power
V_{DS}=50V, $I_{DS(DC)}$=1.0A
PW=100μsec., Duty=10%



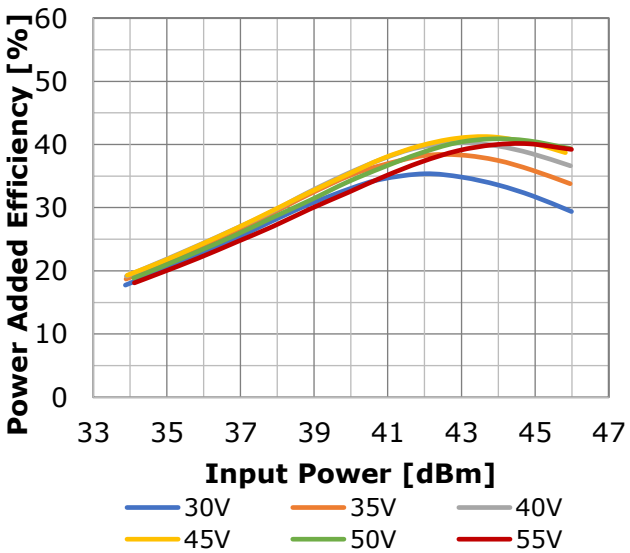
Output Power vs. Frequency
V_{DS}=50V, $I_{DS(DC)}$=1.0A
PW=100μsec., Duty=10%



Output Power vs. Input Power by Drain Voltage
f=10 GHz, $I_{DS(DC)}$=1.0A
PW=100μsec., Duty=10%

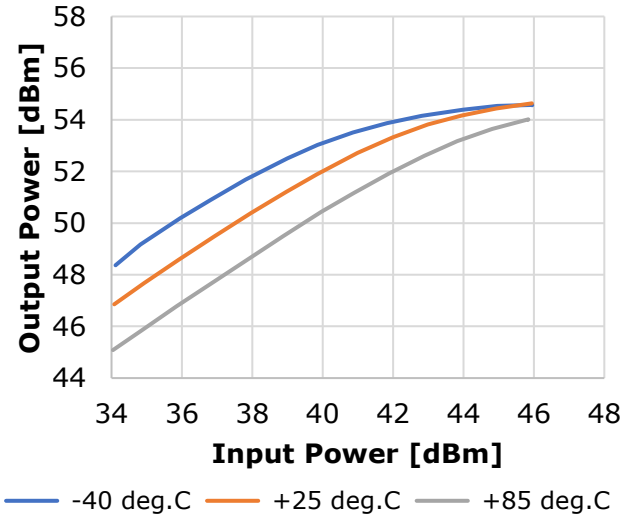


Power Added Efficiency vs. Input Power by Drain Voltage
f=10 GHz, $I_{DS(DC)}$=1.0A
PW=100μsec., Duty=10%

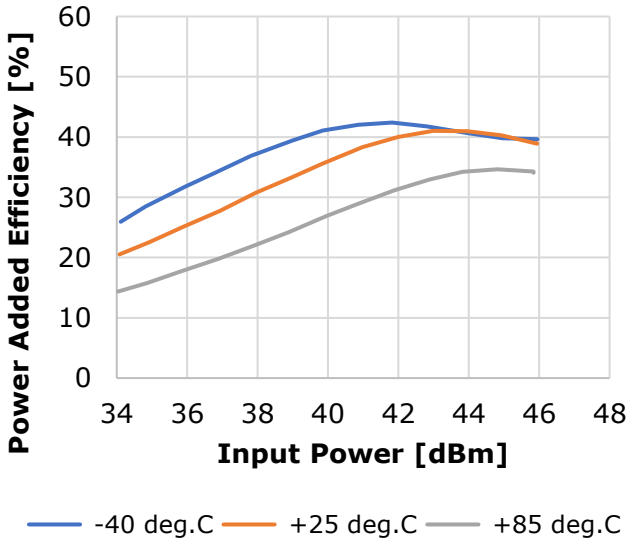


● RF Characteristics

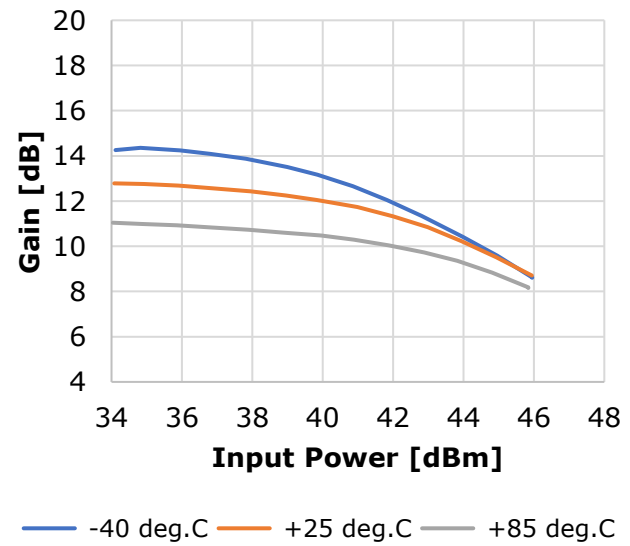
Output Power vs. Input Power
by case temperature
f=10 GHz, V_{DS}=50V, $I_{DS(DC)}$=1.0A
PW=100μsec., Duty=10%



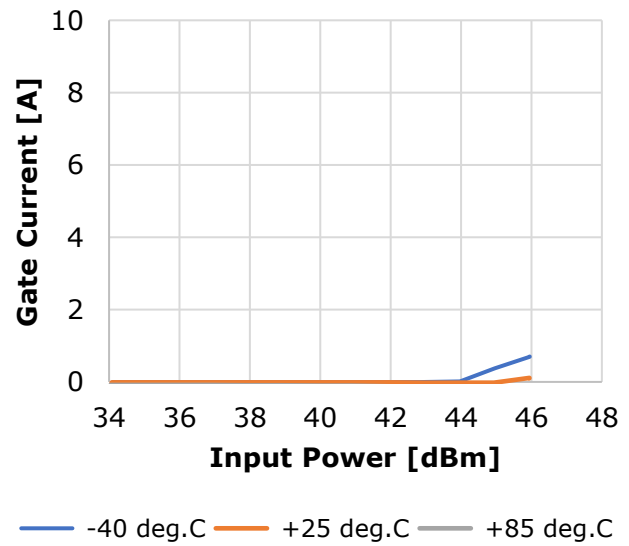
Power Added Efficiency vs. Input Power
by case temperature
f=10 GHz, V_{DS}=50V, $I_{DS(DC)}$=1.0A
PW=100μsec., Duty=10%



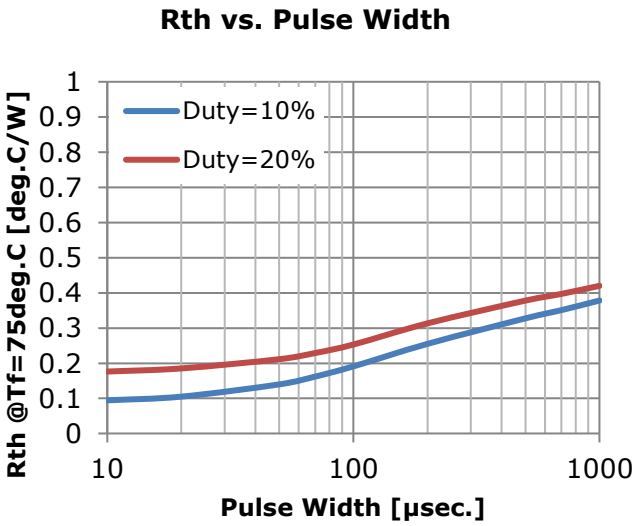
Gain vs. Input Power
by case temperature
f=10 GHz, V_{DS}=50V, $I_{DS(DC)}$=1.0A
PW=100μsec., Duty=10%



Gate Current vs. Input Power
by case temperature
f=10 GHz, V_{DS}=50V, $I_{DS(DC)}$=1.0A
PW=100μsec., Duty=10%



Thermal Characteristics In Pulsed Operation



Ordering Information

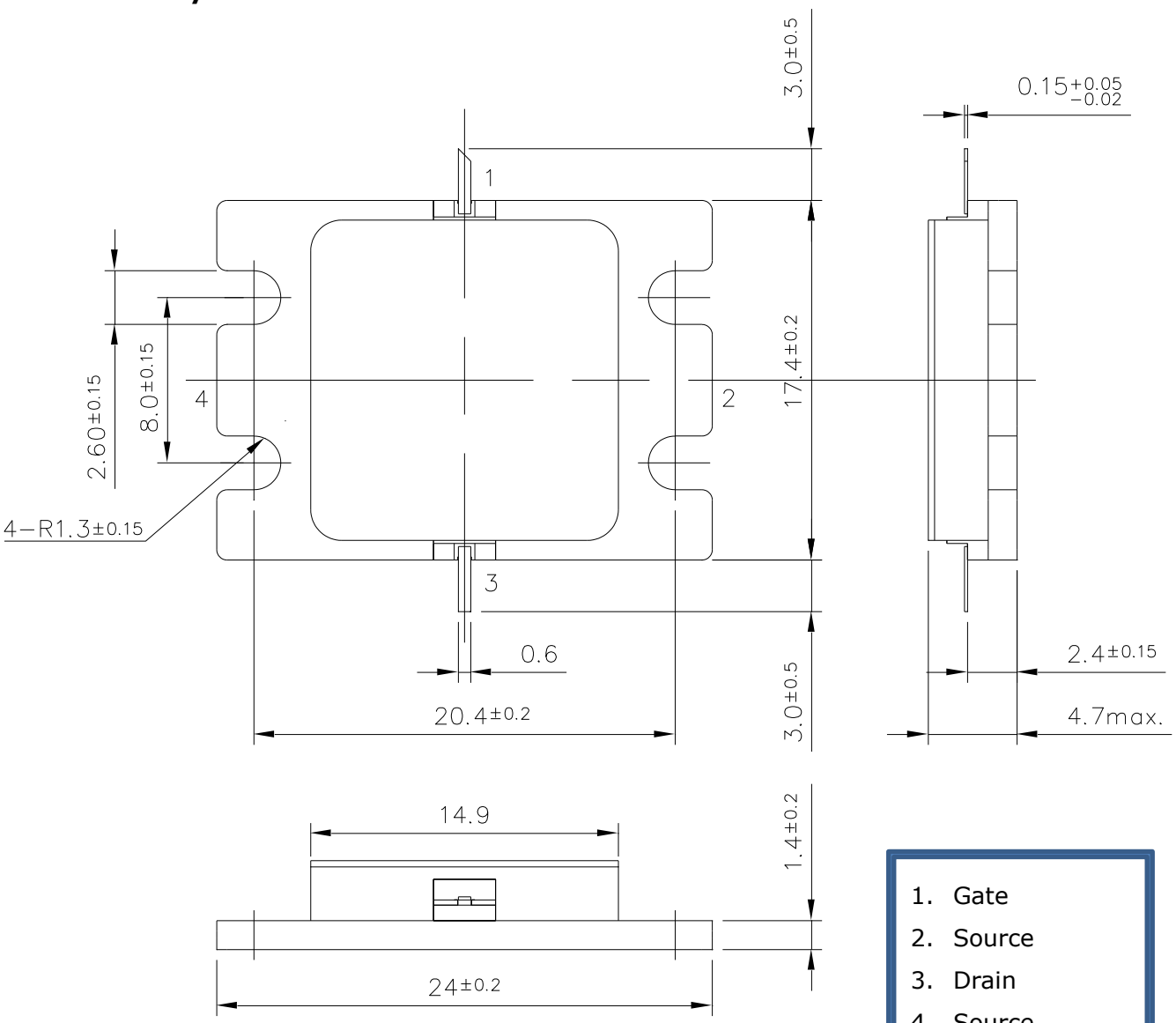
Part Number	PGS	Phase data	Packing Style
SGC1011-300B-R	No	No	JEDEC Tray
SGC1011-300B-R/001	Yes	Yes	JEDEC Tray
SGC1011-300B-R/002	No	Yes	JEDEC Tray

Notes:

- PGS means a graphite sheet. It is included as an attachment.
- Phase data will be included in the shipping data as a reference value.

Package Outline

Case Style : IK

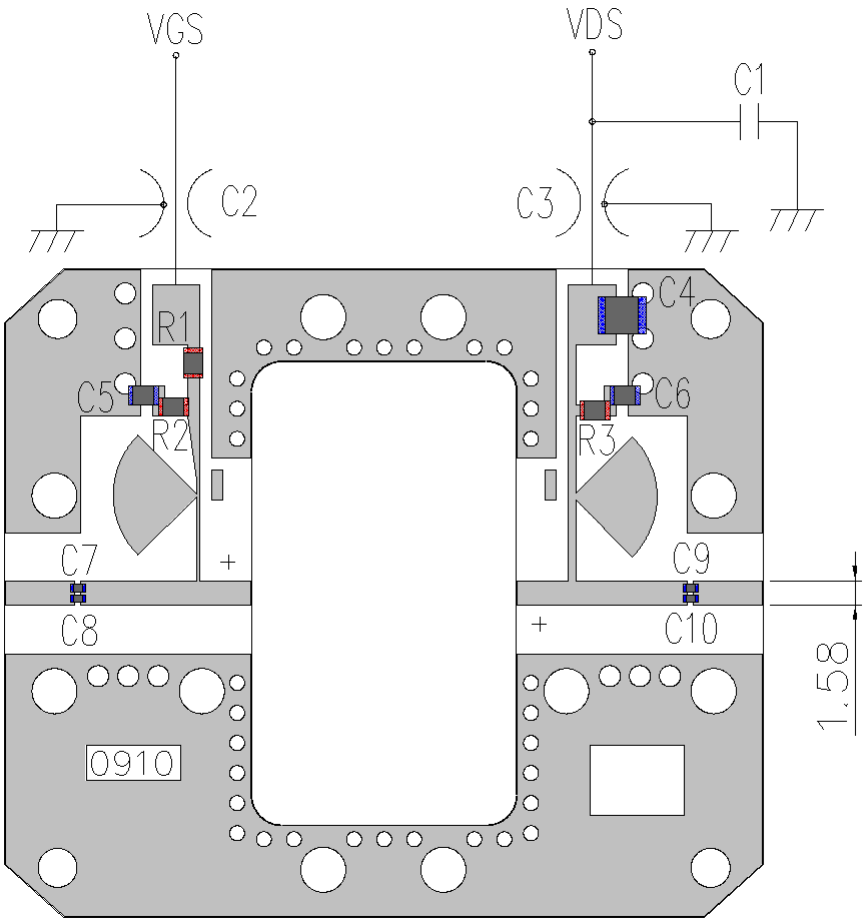


1. Gate
2. Source
3. Drain
4. Source

Unit: mm

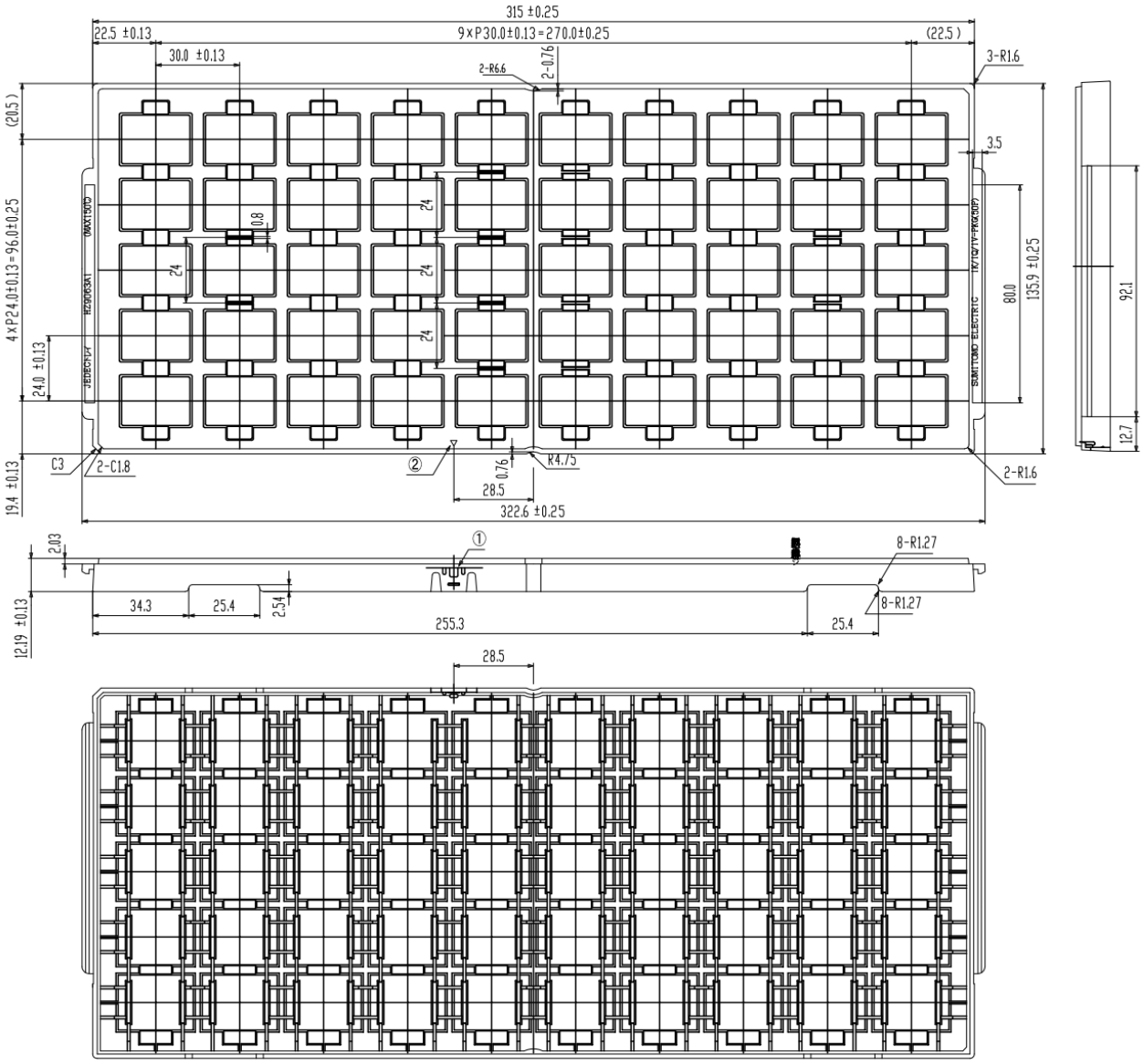
Tolerance: ±0.15

- **Circuit board example**



Part Index	Description
C1	1000uF, AEC
C2, C3	1000pF, feedthrough EMI filter
C4	10uF, MLCC, 3225M
C5, C6	1000pF, MLCC, 2012M
C7, C8, C9, C10	0.75pF, MLCC, 1005M
R1	10ohm Resistor
R2, R3	51ohm Resistor
PCB	Rogers RT5880C, 20mil

- **JEDEC Tray of IK package**



Material : PPE

Unit: mm

- **Products with PGS will come with a graphite sheets.**
  Below is packing example for reference purpose only and subject to change.

Graphite Sheets Shipping Data JEDEC tray

Notes:

- The enclosed graphite sheet is “Panasonic, EYGS series, thickness 0.1mm”. Outgoing inspection (RF test) of the products is performed with the same graphite sheet.
- Long-term reliability of Sumitomo Electric's product is confirmed without the graphite sheet.
- Basically, quality of graphite sheet is outside of Sumitomo Electric's warranty. It will be customer’s choice whether the products will be used with or without graphite sheets. Please confirm the necessary reliability according to the customer’s usage condition.

Notes & Disclaimer

- Do not put this product into the mouth.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Respect all applicable laws of the country when discarding this product.
  This product must be disposed in accordance with methods specified by applicable hazardous waste procedures.

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