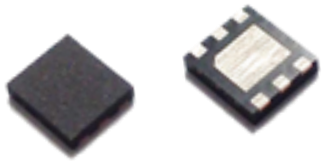
■ Features

- High Power GaN HEMT for DC to 3.8GHz
- High Power: 17W @ 3.8GHz
- High Efficiency: 56% @ 3.8GHz
- DFN Plastic Package



■ Description

Sumitomo Electric's GaN-HEMT SGNL015Z2K-R offers high power, high efficiency, ease of matching and greater consistency for DC to 3.8GHz Radar applications with 50V operation. SGNL015Z2K-R is suitable for broadband applications.

ABSOLUTE MAXIMUM RATINGS (Case Temperature T_C=25deg.C)

Item	Symbol	Rating	Unit
Operating-Voltage	V_{DS}	55	V
Drain-Source Voltage	V_{DS}	160 @ V_{GS}-8V	V
Gate-Source Voltage	V_{GS}	-15	V
Total Power Dissipation	Pt	27	W
Storage Temperature	T_{stg}	-40 to +125	deg.C
Channel Temperature	T_{ch}	+250	deg.C

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V_{DS}		<=50	V
Forward Gate Current	I_{GF}	RG=15ohm	<=7.49	mA
Reverse Gate Current	I_{GR}	RG=15ohm	>=-0.29	mA
Output Power	P_{OUT}		<=P5dB	dBm
Channel Temperature	T_{ch}		<=200	deg.C

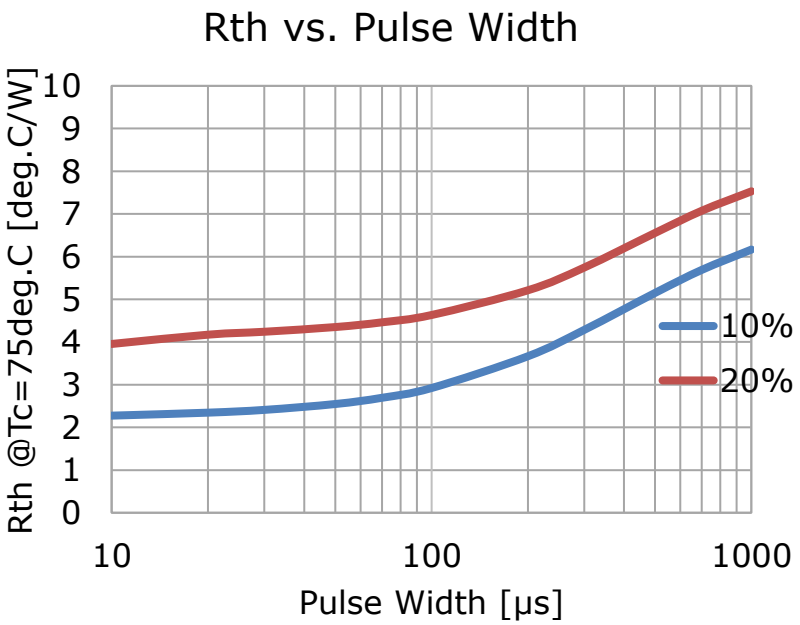
ELECTRICAL CHARACTERISTICS *1 (Case Temperature T_C=25deg.C)

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-off Voltage	V_P	V_{DS}=50V, I_{DS}=2.64mA	-3.45	-	-2.45	V
Output Power	P_{out} *2	V_{DS}=50V , $I_{DS(DC)}$=0mA	41.7	42.4	-	dBm
Drain Efficiency	DE *2	f=3.8GHz , Pin=30.5dBm	50.0	56.0	-	%
Thermal Resistance	R_{th} *3		-	7.2	8.3	deg.C/W

CASE STYLE	Z2K
RoHS Compliance	YES

Note : *1 : Device screening test items and conditions
*2 : 10%-duty RF pulse (DC supply constant)
*3 : Sampling Test : samples size 10pcs. Criteria(accept / reject)=(0 / 1)

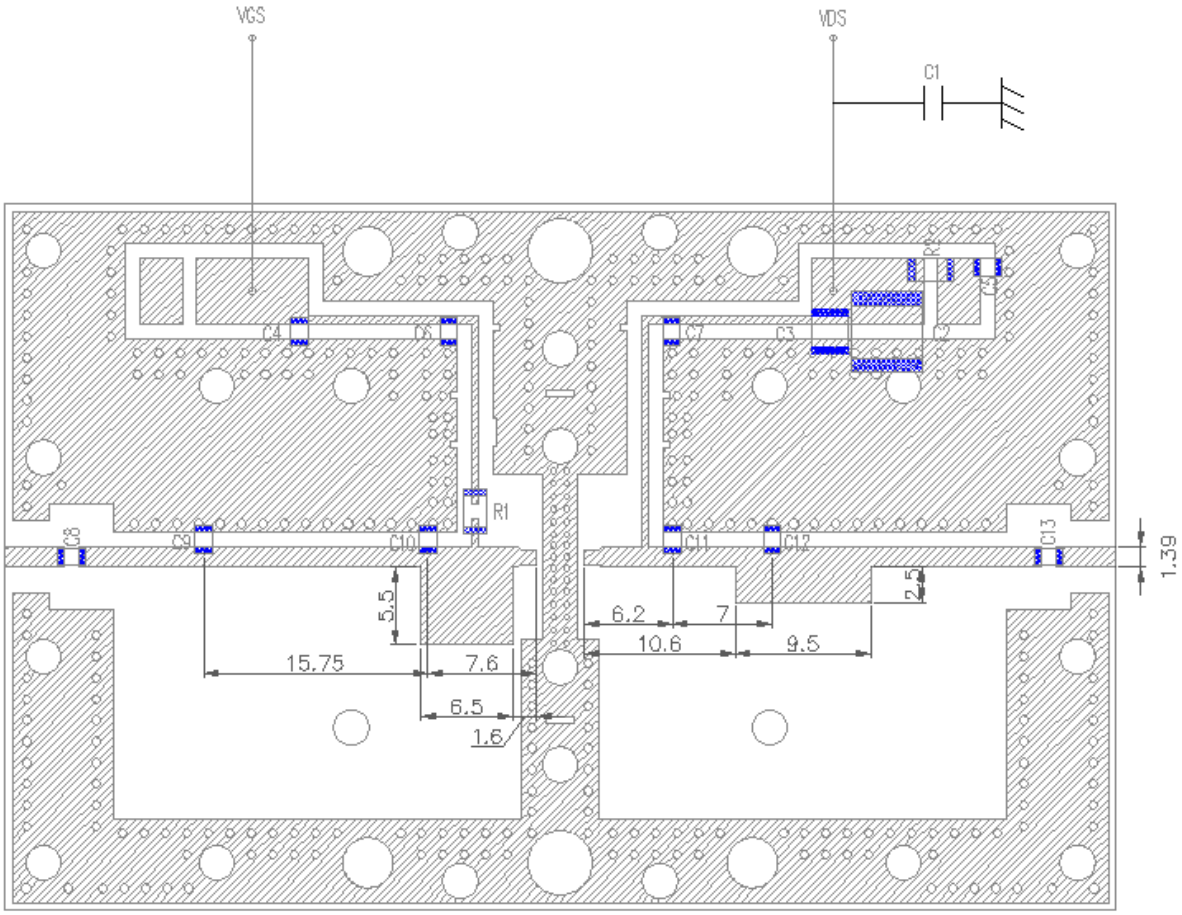
- **Thermal Characteristics In Pulsed Operation**



Note : This data included the PCB board (base material CS3376C t=0.6mm Cu=18μm)
Channel to Case at 16W PDC

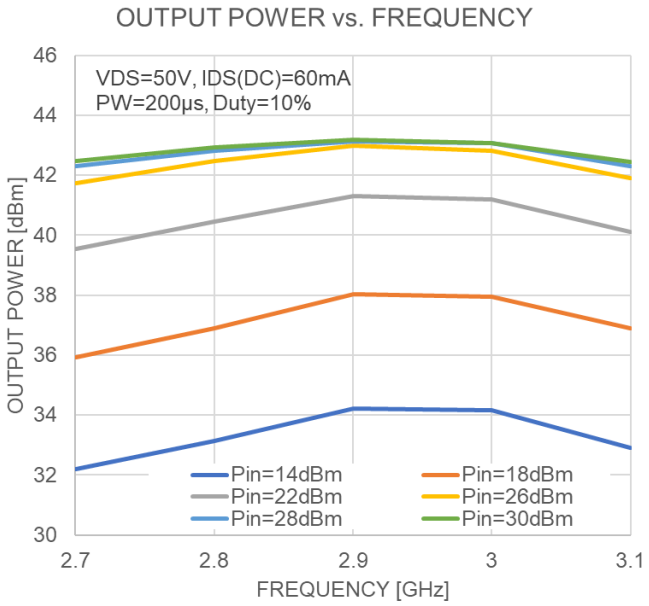
- **Electrical characteristics (2.7 to 3.1 GHz)**

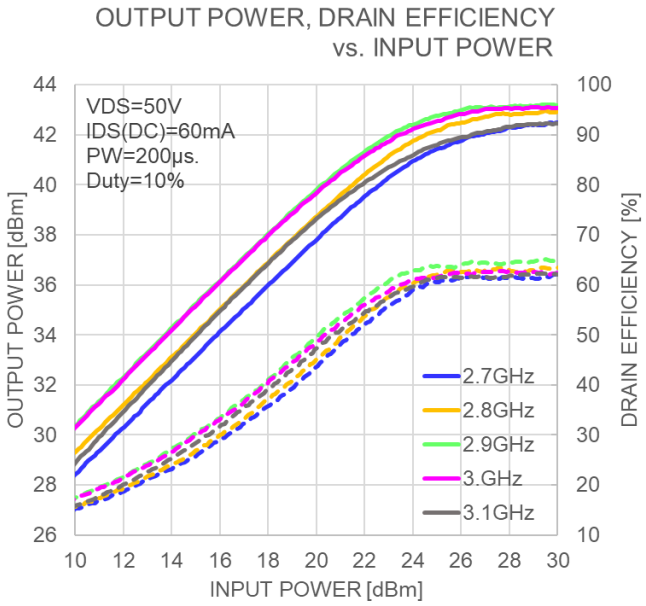
  - **matching circuit for 2.7 to 3.1 GHz**

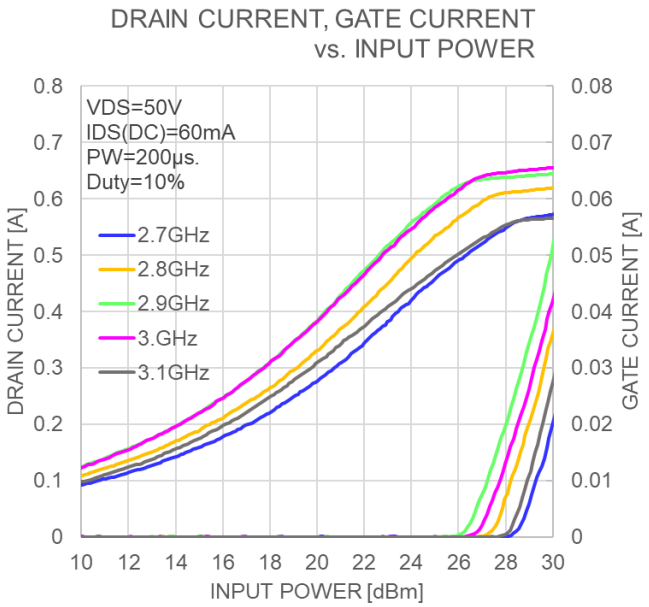


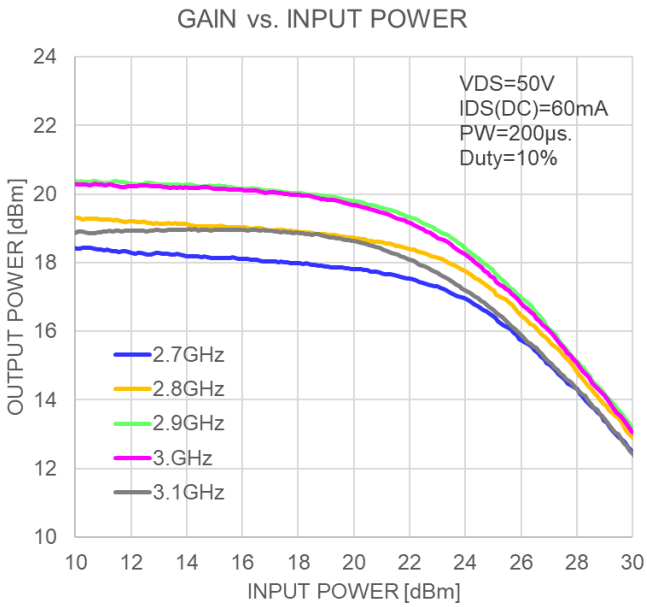
C1	39uF
C2	4.7uF
C3	0.22uF
C4,C5	1000pF
C6,C7,C8,C13	10pF
C9	1.0pF
C10	0.3pF
C11	2.0pF
C12	0.8pF
R1	15ohm
R2	51ohm
PCB	t=0.6mm, εr=3.5

- **Electrical characteristics (2.7 to 3.1 GHz)**

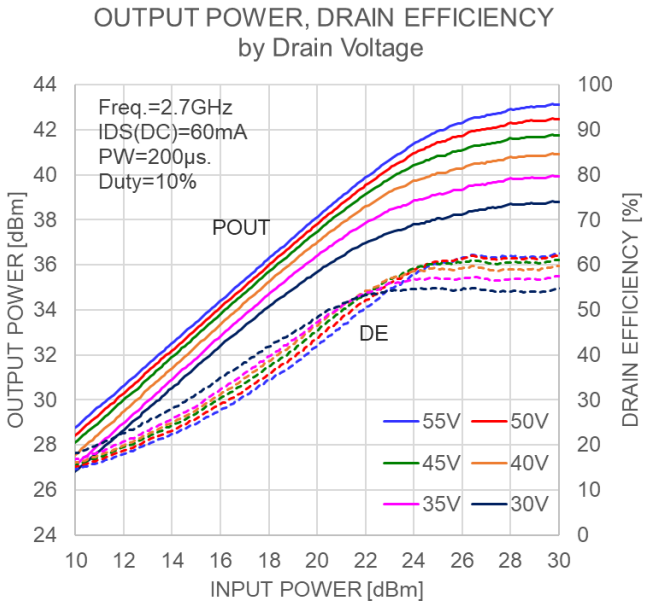


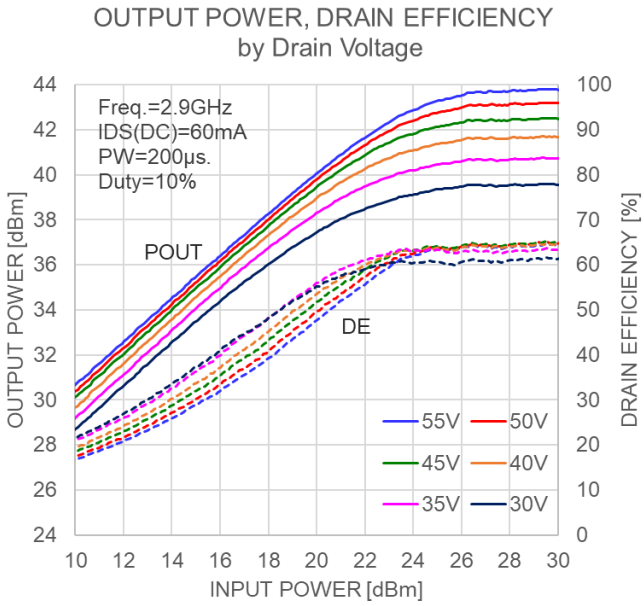


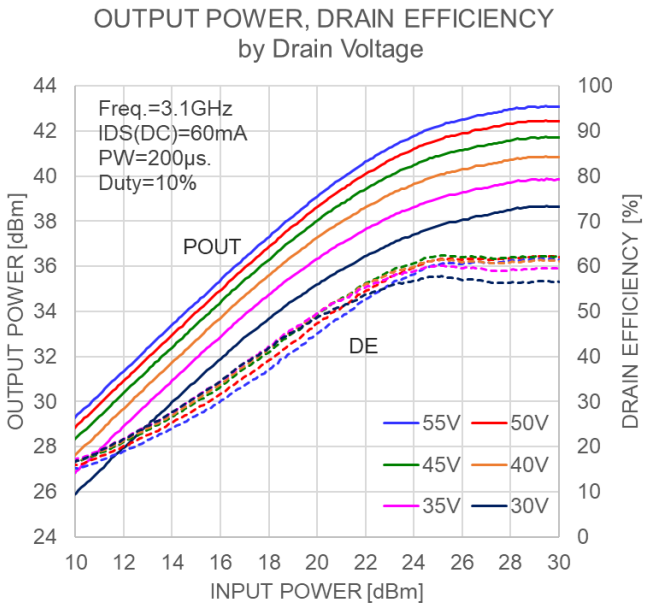


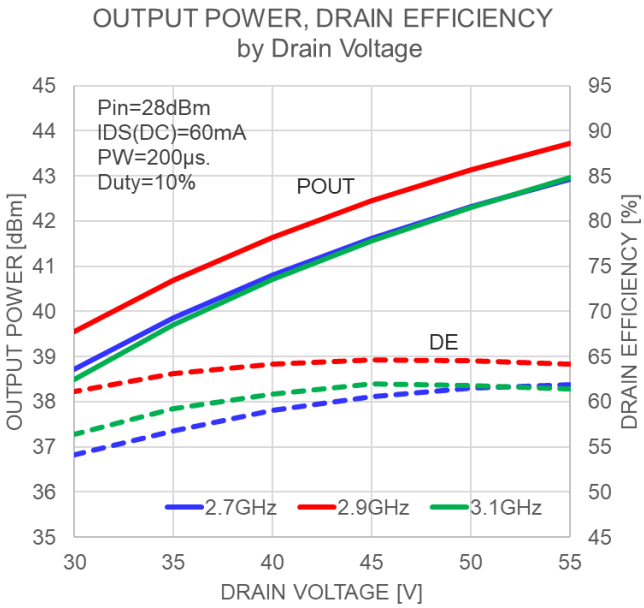


- **Electrical characteristics (2.7 to 3.1 GHz)**

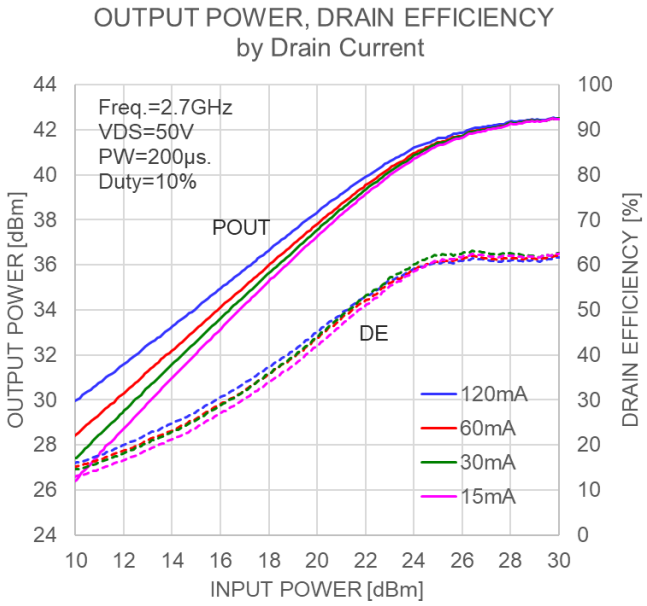


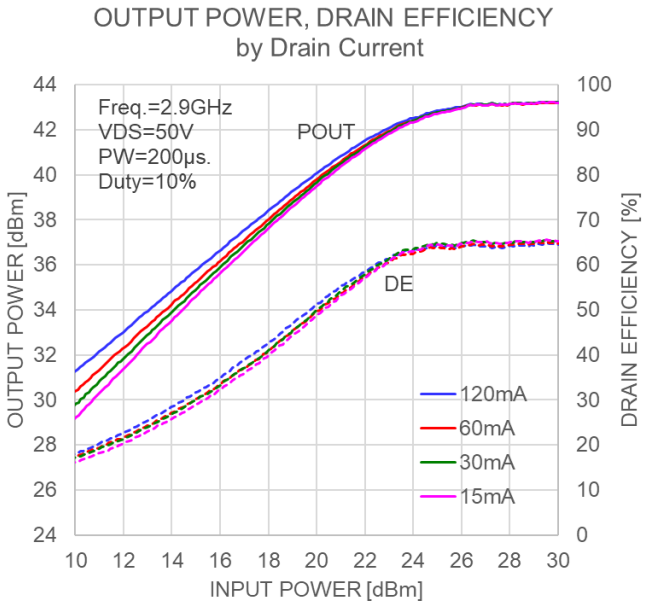


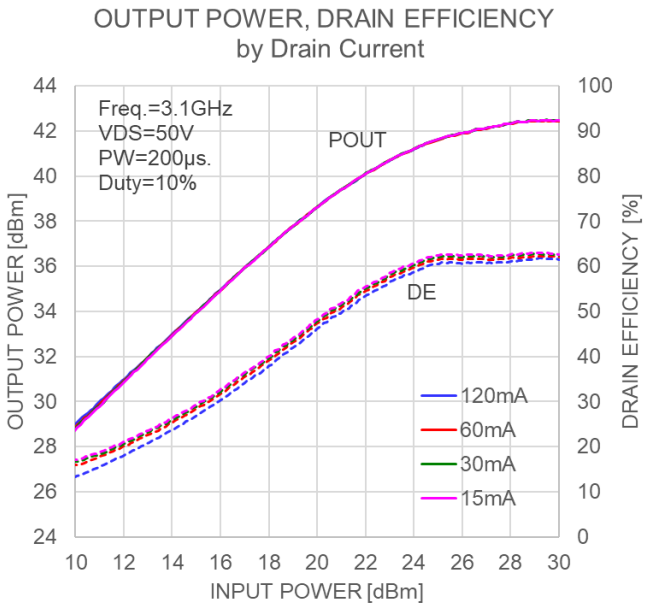


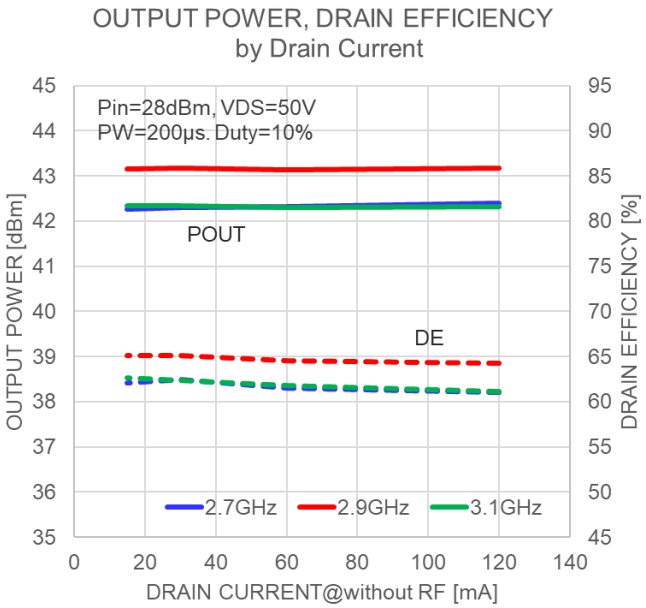


- **Electrical characteristics (2.7 to 3.1 GHz)**



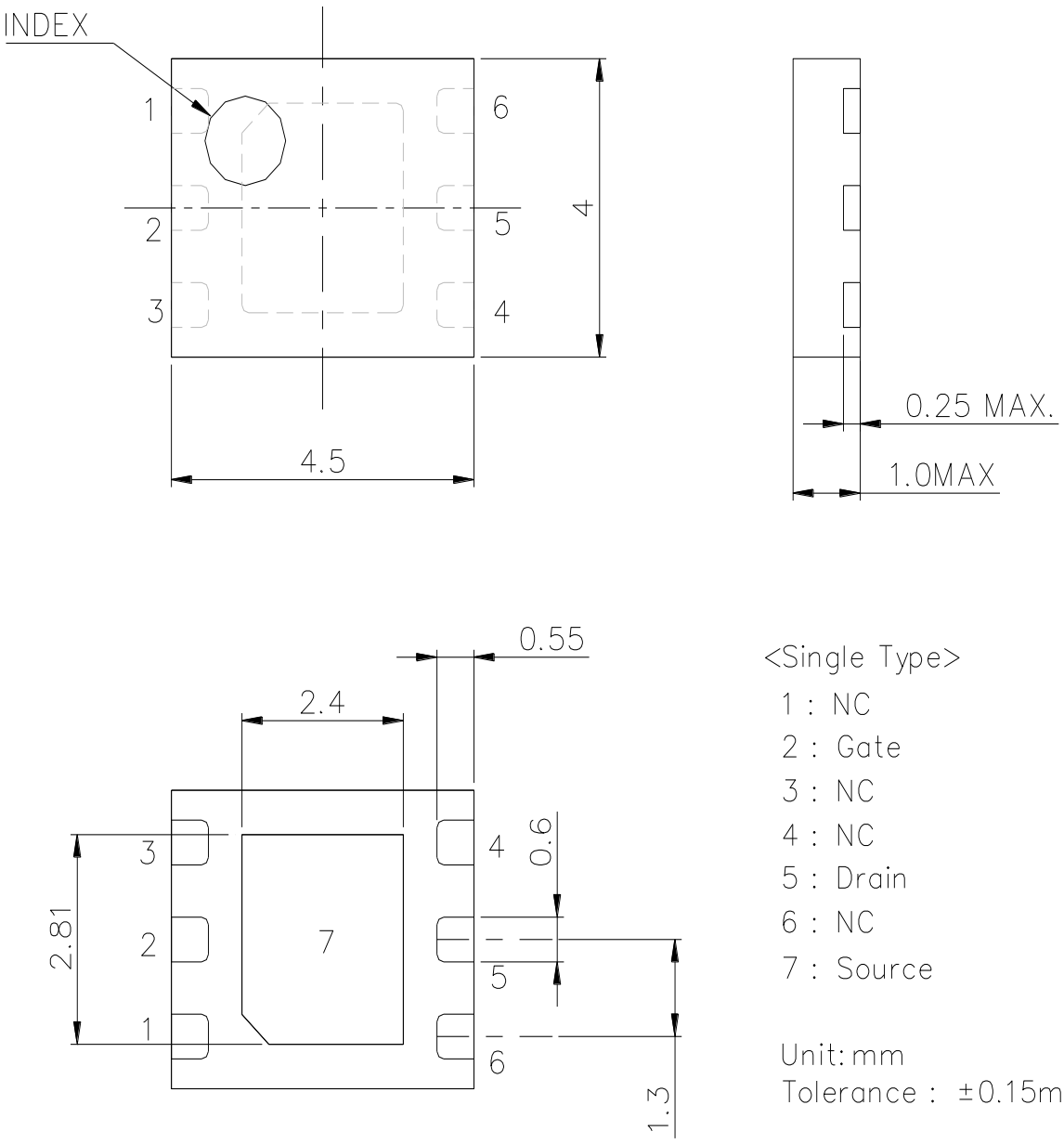






- **Package Outline**

Case Style : Z2K

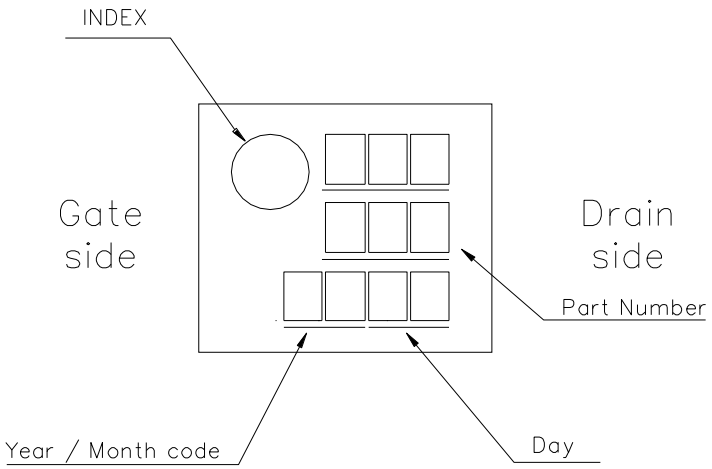


<Single Type>

1 : NC
2 : Gate
3 : NC
4 : NC
5 : Drain
6 : NC
7 : Source

Unit: mm
Tolerance : ±0.15mm

- **Package Markings**



- **Year code**

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028
Code	C	D	E	F	G	H	I	J	K

Note: Code letter is cycling 25 alphabet without Q.

- **Month code**

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Code	H	M	N	P	R	S	T	U	W	X	Y	Z

ESD characteristic

Test Methodology	Class
Human Body Model (per ANSI/ESDA/JEDEC JS-001-2014)	1B
Charged-Device Model (per ANSI/ESDA/JEDEC JS-002-2014)	C3

Ordering Information

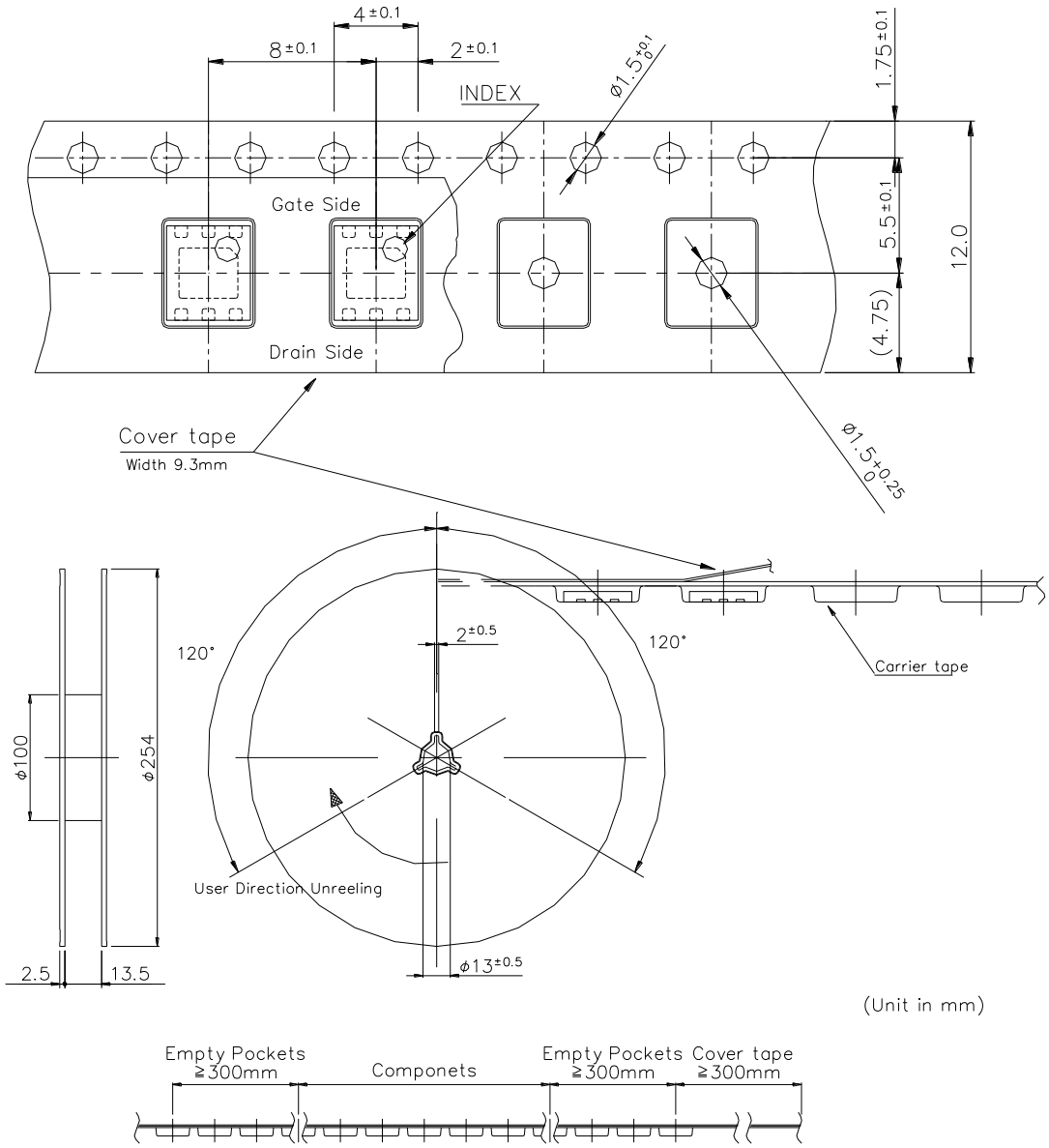
Part Number	MOQ	MOU	Packing Style
SGNL015Z2K-RT	2500pcs.	2500pcs.	Tape and Reel (12mm width Tape)
SGNL015Z2K-RT1	500pcs.	500pcs.	Tape and Reel (12mm width Tape)
SGNL015Z2K-R	20pcs.	20pcs.	Tray (4-inch)

Note : *MOQ stands for Minimum Order Quantity.
*MOU stands for Minimum Order Unit size.

Moisture Sensitivity Level

Level	Floor Life	
	Time	Condition
2	1year after open the package	≤30deg.C/60%RH

- **Index and Tape / Reel Configuration**
  (Part Number : SGNL015Z2K-RT, SGNL015Z2K-RT1)



Note : Baking of Tape & Reel material can not baked at 125deg.C.

● Mounting Method of SMD(Surface Mount Devices) for Lead-free solder

Mounting Condition

(1) For soldering, Lead-free solder (Sn-3.0Ag-0.5Cu)*1 or equivalent shall be used.
(*1: The figure displays with weight %. A predominantly tin-rich alloy with 3.0% silver and 0.5% copper.)

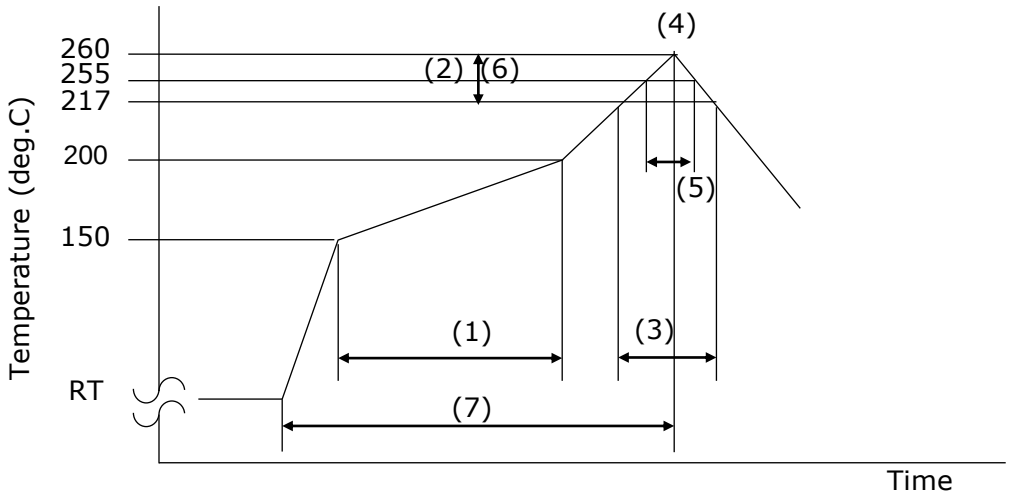
(2) A rosin type flux with a chlorine content of 0.2% or less shall be used. The rosin flux with low halogen content is recommended.

(3) When soldering, use one of the following time / temperature methods for acceptable solder joints. Make sure the devices have been properly prepared with flux prior soldering.

*** Reflow soldering method (Infrared reflow / Heat circulation reflow / Hot plate reflow):**

Limit solder to 3 reflow cycles because resin is used in the modules manufacturing process. Excessive reflow cycles will effect the resin resulting in a potential failure or latent defect. The recommended reflow temperature profile is shown below. The temperature of the reflow profile must be measured at the device body surface.

Reflow temperature profile and condition:



(1) Preheating:	150 to 200 deg.C, 60 to 120 seconds
(2) Ramp-up Rate:	3 deg.C /seconds max
(3) Liquidus temperature and time:	217 deg.C, 60 to 150 seconds
(4) Peak Temperature:	260 deg.C
(5) Time Peak Temperature:	255deg.C, 30seconds max
(6) Ramp-down Rate:	6 deg.C /seconds max
(7) Time RT to peak temperature:	8 minutes max

* Measurement point: Center of the package body surface

(4) The above-recommended conditions were confirmed using the manufacture's equipment and materials. However, when soldering these products, the soldering condition should be verified by customer using their equipment and materials.

For Safety, Observe the Following Procedures Environmental Management

- 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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