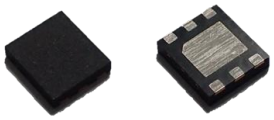
■ Features



- High Voltage Operation : VDS=50V
- Frequency Range : DC to 3.5GHz
- High Power : 43.2dBm (typ.) @ Pout, f=2.45GHz
- High Efficiency : 70% (typ.) @ f=2.45GHz

■ Description

Sumitomo Electric's GaN-HEMT SGNP020Z2K offers high power, high efficiency, ease of matching and greater consistency for DC to 3.5GHz applications with 50V operation.

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	44.1	W
Storage Temperature	T_{stg}	-50 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=100ohm	≤19.64	mA
Reverse Gate Current	I_{GR}	Rg=100ohm	≥-0.32	mA
Output Power	P_{OUT}		≤P4dB	dBm
Channel Temperature	T_{ch}		≤200	deg.C

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

Item	Symbol	Condition		Limit			Unit
				Min.	Typ.	Max.	
Pinch-off Voltage	V_P	V_{DS}=50V, I_{DS}=2.88mA		-3.30	-2.80	-2.30	V
Output Power	P_{out} *1	V_{DS}=50V, $I_{DS(DC)}$=80mA f=2.45GHz	Pin=25.5dBm	42.2	43.2	-	dBm
Drain Efficiency	DE *1			-	70	-	%
Linear Gain	GL *1		Pin=15.5dBm	20.0	21.0	-	dB
Thermal Resistance	R_{th} *2	Channel to Case at 24W PDC		-	4.4	5.1	deg.C/W

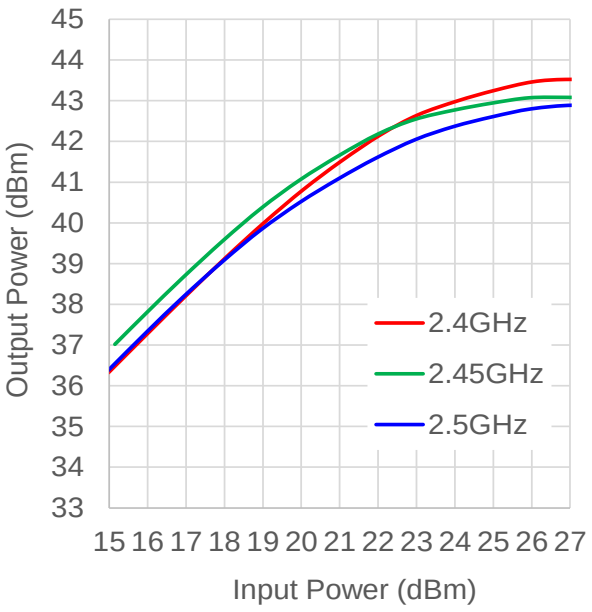
CASE STYLE	Z2K
RoHS Compliance	YES

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

■ RF Characteristics

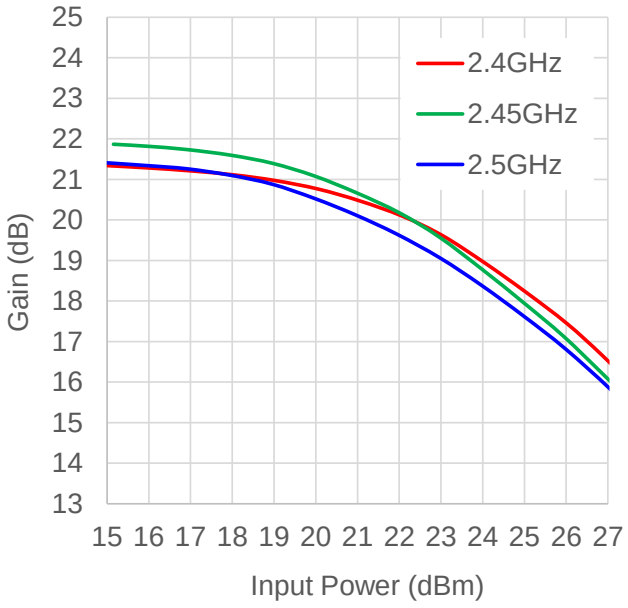
Output Power vs. Input Power

V_{DS}=50V, $I_{DS(DC)}$=80mA, CW



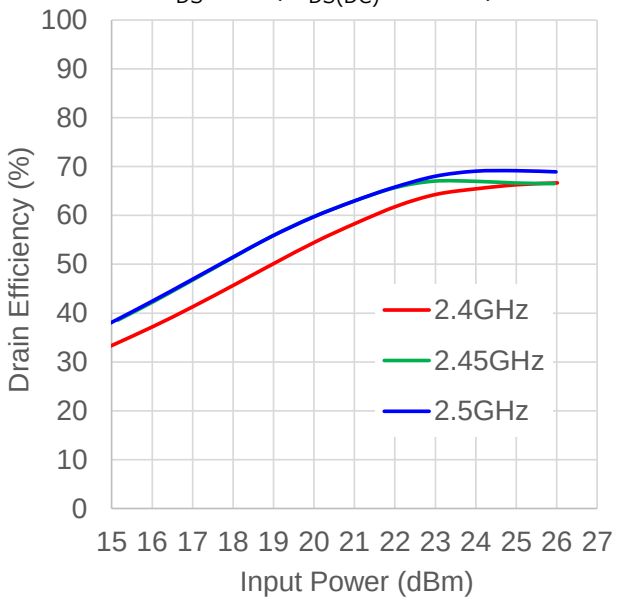
Gain vs. Input Power

V_{DS}=50V, $I_{DS(DC)}$=80mA, CW



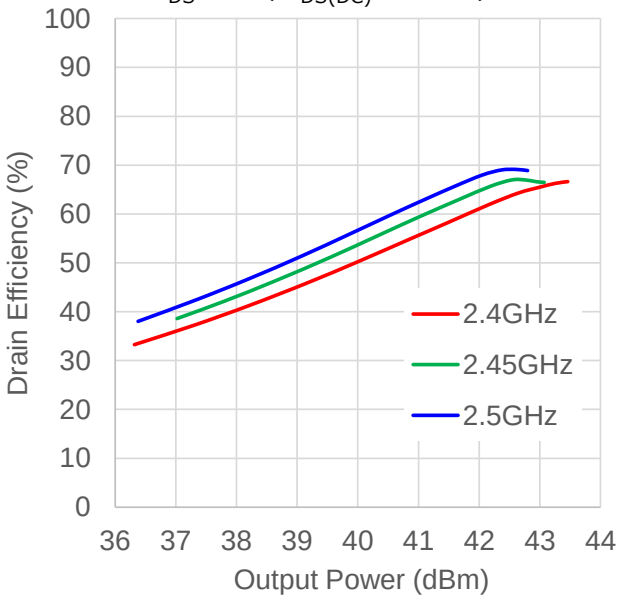
Drain Efficiency vs. Input Power

V_{DS}=50V, $I_{DS(DC)}$=80mA, CW

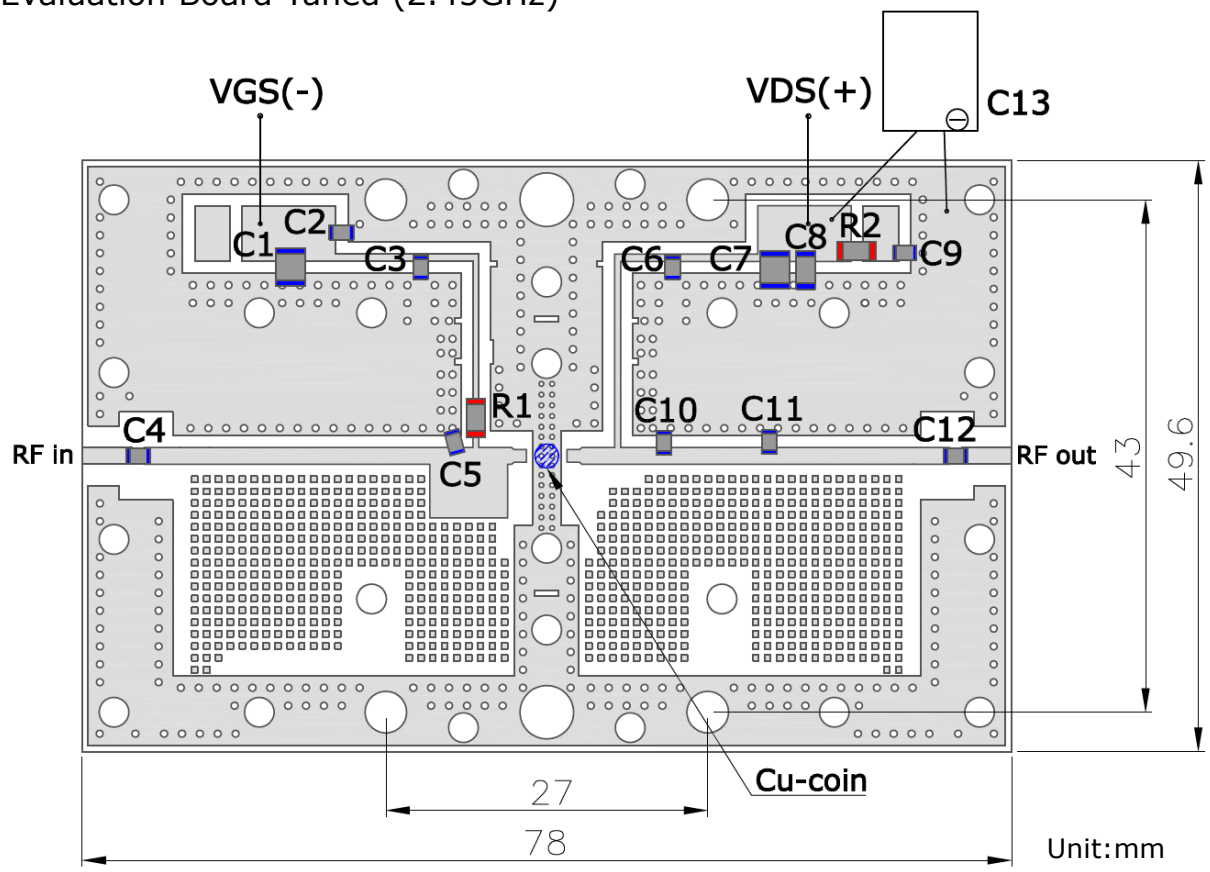


Drain Efficiency vs. Output Power

V_{DS}=50V, $I_{DS(DC)}$=80mA, CW



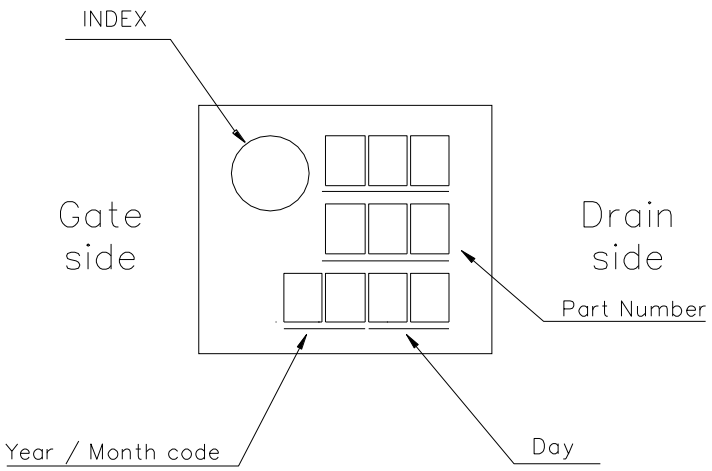
■ Evaluation Board Tuned (2.45GHz)



■ Evaluation Board Bill of Materials

Part Index	Description	Size	Manufacturer	Part Number
C1, C7	0.22μF	3225M	Murata	GRM21AR72A224KAC5
C8	4.7μF	3216M	Murata	GRM31CC72A475KE11L
R2	51ohm	3216M	Rohm	MCR18EZPJ510
C3, C4, C6, C12	10pF	2012M	Murata	GQM2195C2E100FB12
C2, C9	1000pF	2012M	Murata	GRM21AR72E102KW01
C5	2.0pF	2012M	Murata	GRM2195C2E2R0WB12
C10	2.2pF	2012M	Murata	GRM2195C2E2R2WB12
C11	0.8pF	2012M	Murata	GRM2195C2ER80WB12
C13	39μF	-	Nippon Chemi-Con	EKZE101ETD390MH15D
R1	100ohm	3216M	Rohm	MCR18SEQPJ101
PCB	t=0.6mm, er=3.3, Cu thickness=18 μm	-	RISHO KOGYO	CS-3376C

■ Package Markings



■ Year code

Year	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	I	J	K	L	M	N	O	P	R

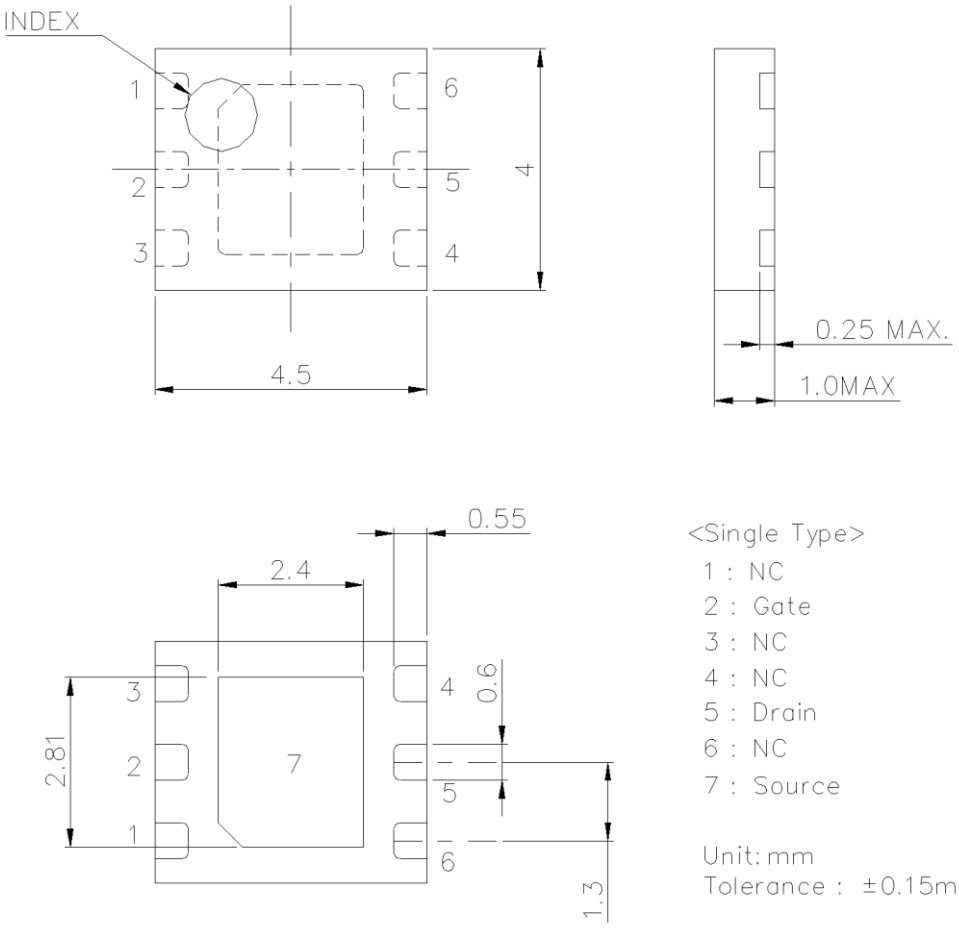
Note: Code letter is cycling 25 alphabet without Q.

■ 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

■ Package Outline

Z2K Package Outline
Full Mold Plastic Package



<Single Type>
1 : NC
2 : Gate
3 : NC
4 : NC
5 : Drain
6 : NC
7 : Source

Unit: mm
Tolerance : ±0.15mm

■ ESD characteristic

Test Methodology	Class
Human Body Model (per ANSI/ESDA/JEDEC JS-001)	0B
Charged-Device Model (per ANSI/ESDA/JEDEC JS-002)	C3

■ Ordering Information

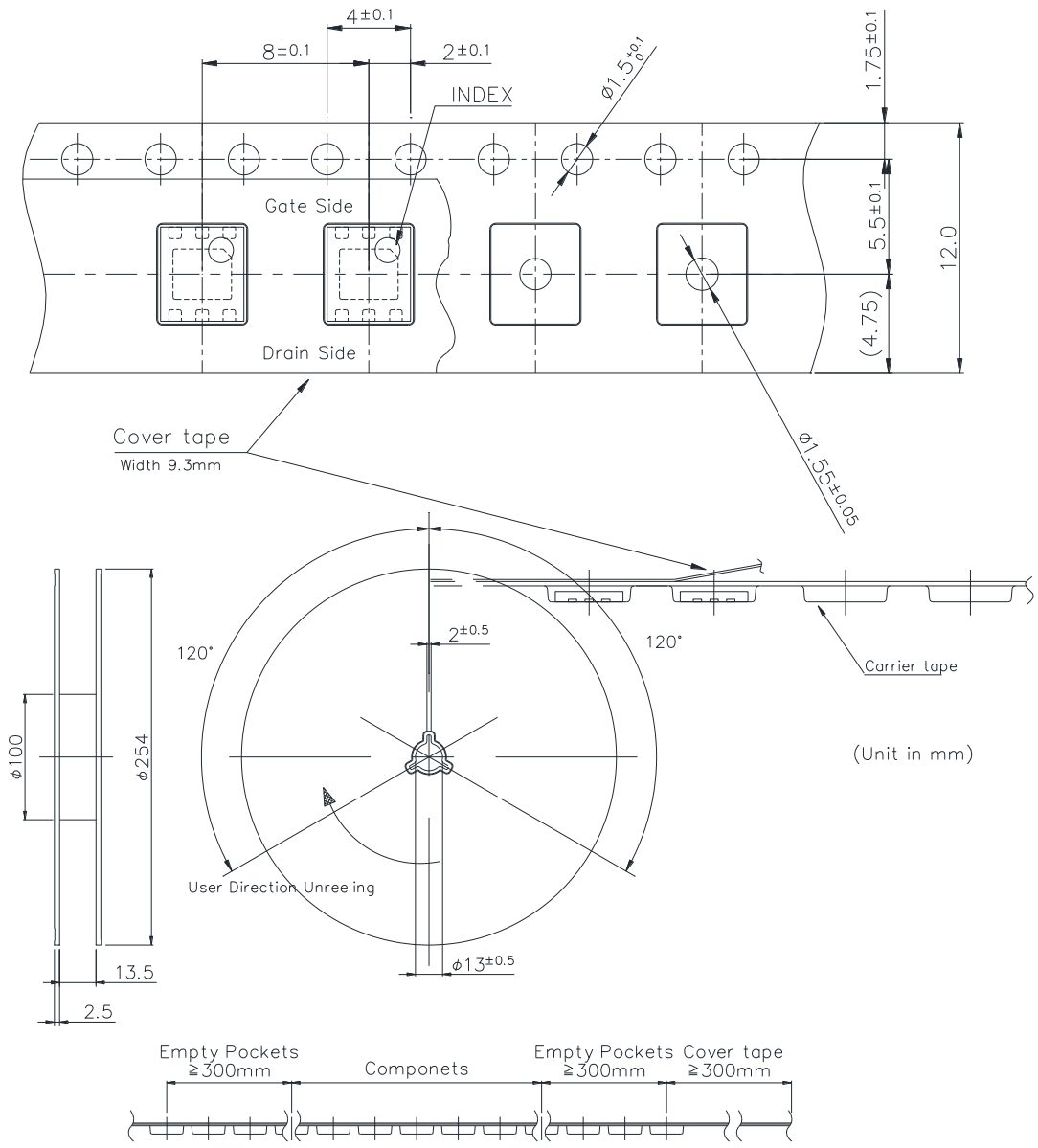
Part Number	MOQ	MOU	Packing Style
SGNP020Z2KT	2500pcs.	2500pcs.	Tape and Reel (12mm width Tape)
SGNP020Z2KT1	500pcs.	500pcs.	Tape and Reel (12mm width Tape)
SGNP020Z2K	20pcs.	20pcs.	Tray (4-inch)

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 : SGNP020Z2KT, SGNP020Z2KT1)



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

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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