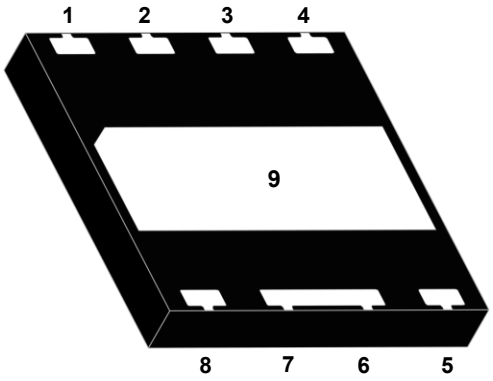
GR-65J150AM: DFN 8x8 Cascode GaN HEMT

Description

GR-65J150AM is a normally-off GaN High electron mobility transistor (HEMT) device using the cascode configuration, which provides high breakdown voltage, high current and high operating speed which is suitable for high power applications.

GR-65J150AM (DFN-8x8-8L)



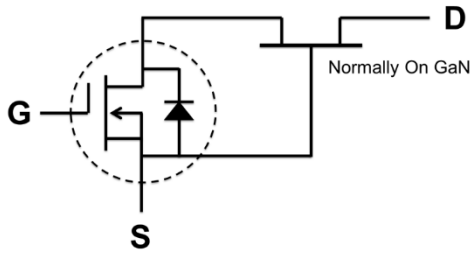
Drain: 1, 2, 3, 4
Source: 5, 6, 7
Gate: 8
Source, Floating: 9

Key Specifications

Part Number	GR-65J150AM
V_{DSS}	650V
$V_{(TR)DSS}$	800V
$R_{DS(ON)}$, typ.	148mΩ
Q_G, typ.	11.8nC
Package	DFN 8 x 8 mm

Features

- Gate drive voltage compatibility (-20V to +20V)
- High operating frequency
- Low Qrr
- ESD-resistant
- Comply with JEDEC standards



Cascode Device Structure

Applications

- Switch Mode Power Supplies (SMPS)
- AC-DC/DC-DC Converters: Boost, Buck, QR Flyback, ACF, AHB, LLC, Half/Full Bridge Application
- Motor Drives, Lighting, Server

1- Electrical Characteristics

➢ Table 1 Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain-source voltage		650	V
$V_{(TR)DSS}$	Transient drain to source voltage[a]		800	V
V_{GSS}	Gate- source voltage		-20 ~ +20	V
I_D	Drain current (continuous) at T_C = 25°C operation		14.1	A
	Drain current (continuous) at T_C = 100°C operation		8.9	A
$I_{D,Pulse}$	Pulsed drain current (pulse width: 10μs)		52.9	A
P_D	Maximum power dissipation at T_C = 25°C		63	W
T_c	Operating temperature	Case	-55 to +150	°C
T_J		Junction	-55 to +150	°C
T_S	Storage temperature		-55 to +150	°C
T_{SOLD}	Soldering peak temperature[b]		260	°C
MSL	Moisture sensitivity level		MSL3	-

a. In off-state, spike duty cycle D<0.01, spike duration <1μs
b. For 10 sec., 1.6mm from the case

➢ Table 2 Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\Theta JA}$	Thermal resistance junction-ambient	65	°C/W
$R_{\Theta JC}$	Thermal resistance junction-case	2.0	°C/W

➢ Table 3 ESD Rating

Symbol	Reference	Value	Unit
HBM (G-S) (G-D)	ANSI/ESDA/JEDEC JS-001-2024	2000	V
HBM (D-S)	ANSI/ESDA/JEDEC JS-001-2024	8000	V

➢ **Table 4 Electrical Characteristics** (T_{CASE} = 25 °C unless otherwise stated)

Symbol	Parameter	Conditions	Values			Unit
			min.	typ.	max.	
$V_{(BL)DSS}$	Drain-source voltage	V_{GS}=0V	650	-	-	V
$V_{GS(th)}$	Gate threshold voltage	V_{GS}=V_{DS} ,I_D=1mA	2.0	3.0	4.0	V
$R_{DS(on)}$	Static drain-source on-resistance	V_{GS}=10V, I_D=5A, T_J=25 °C	-	148	182	mΩ
		V_{GS}=10V, I_D=5A, T_J=150 °C	-	266	-	
I_{DSS}	Drain-source leakage current	V_{GS} =0V, V_{DS} =650V, T_J=25°C	-	2.5	50	μA
		V_{GS} =0V, V_{DS} =650V, T_J=150°C	-	10.0	-	
I_{GSS}	Gate-to-source forward leakage current	V_{GS}=20V	-	-	100	nA
	Gate-to-source reverse leakage current	V_{GS}=-20V	-	-	-100	
C_{ISS}	Input capacitance	V_{GS}=0V, V_{DS}=400V, f=1MHz	-	743	-	pF
C_{OSS}	Output capacitance		-	22.8	-	
C_{RSS}	Reverse transfer capacitance		-	2.35	-	
Q_G	Gate charge	V_{GS}=0~10V, V_{DS}=400V, I_{DS} =5A	-	11.8	-	nC
Q_{GS}	Gate-source charge		-	3.00	-	
Q_{GD}	Gate-drain charge		-	2.15	-	
Q_{OSS}	Output charge	V_{GS}=0V, V_{DS}=0~400V	-	37.6	-	nC
$t_{D(on)}$	Turn-on delay time	V_{DS}=400V, V_{GS}=0 to 10V, I_{DS}=2A ,R_G=25Ω	-	8.0	-	ns
$t_{D(off)}$	Turn-off delay time		-	13	-	
Q_{RR}	Reverse recovery charge	Is=5A, V_{DS} =400V	-	6.0	-	nC

2- Typical Characteristic Curves

Fig 1. On-Region Characteristics

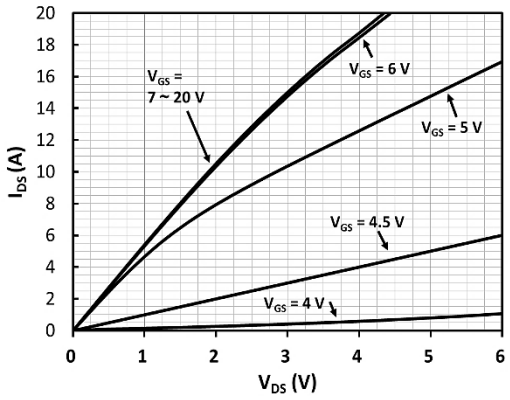


Fig 2. On-Resistance vs Drain Current and Temperature

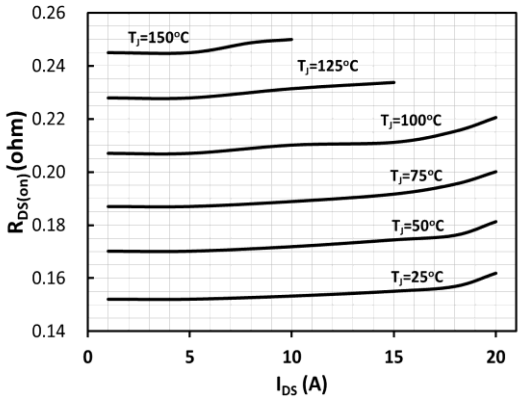


Fig 3. On-Resistance with Drain Current

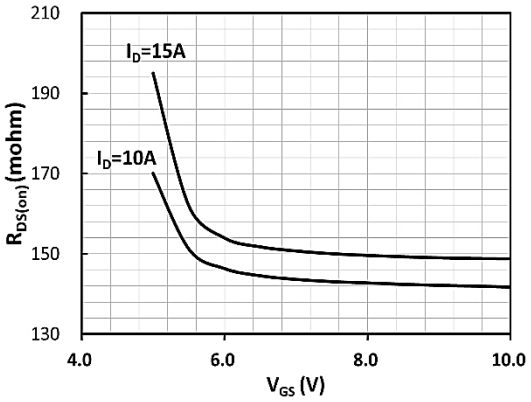


Fig 4. On-Resistance Variation with Temperature

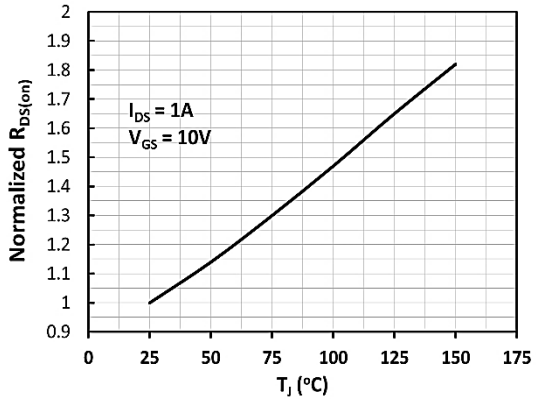


Fig 5. Threshold Voltage with Temperature

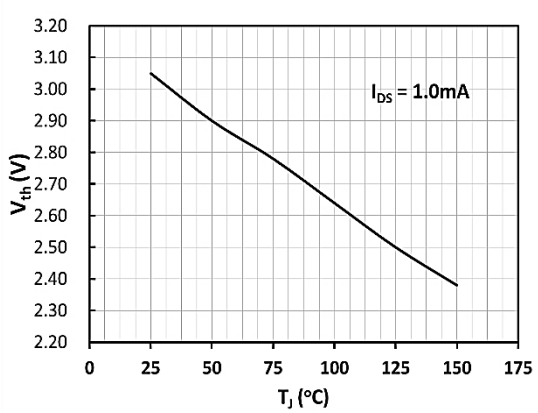


Fig 6. Capacitance Characteristics

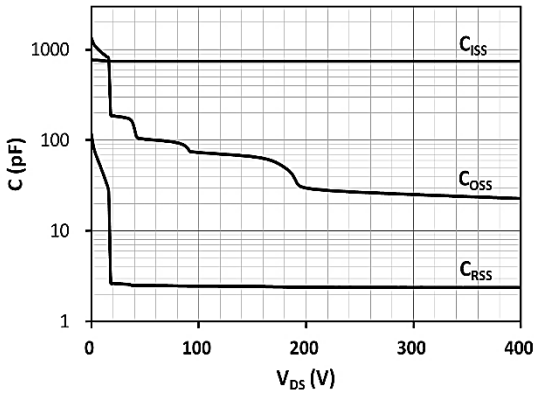


Fig 7. Gate Charge Characteristics, Qg

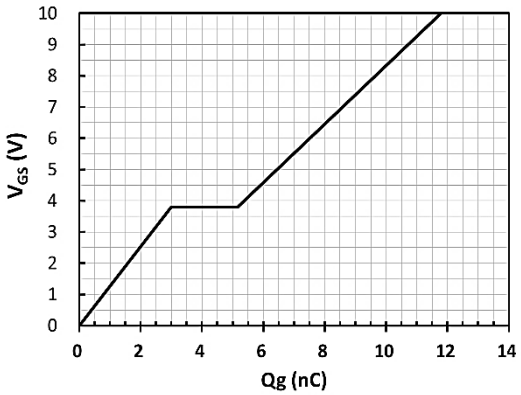


Fig 8. Capacitance Characteristics, Qoss

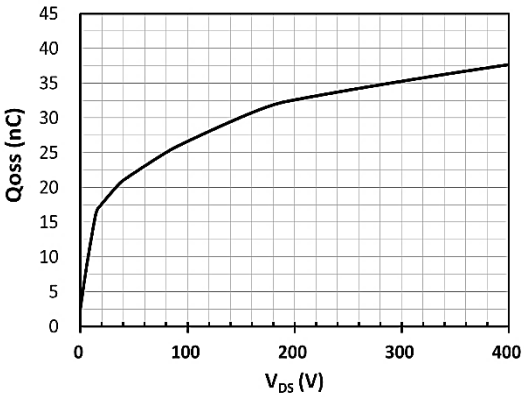
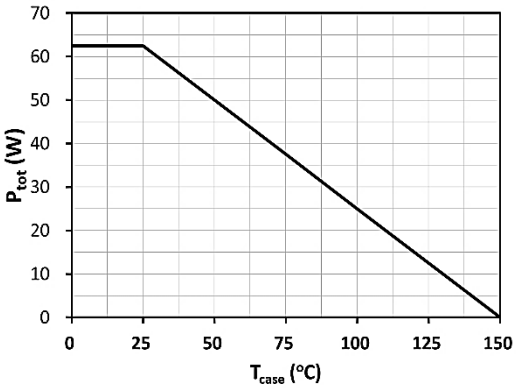
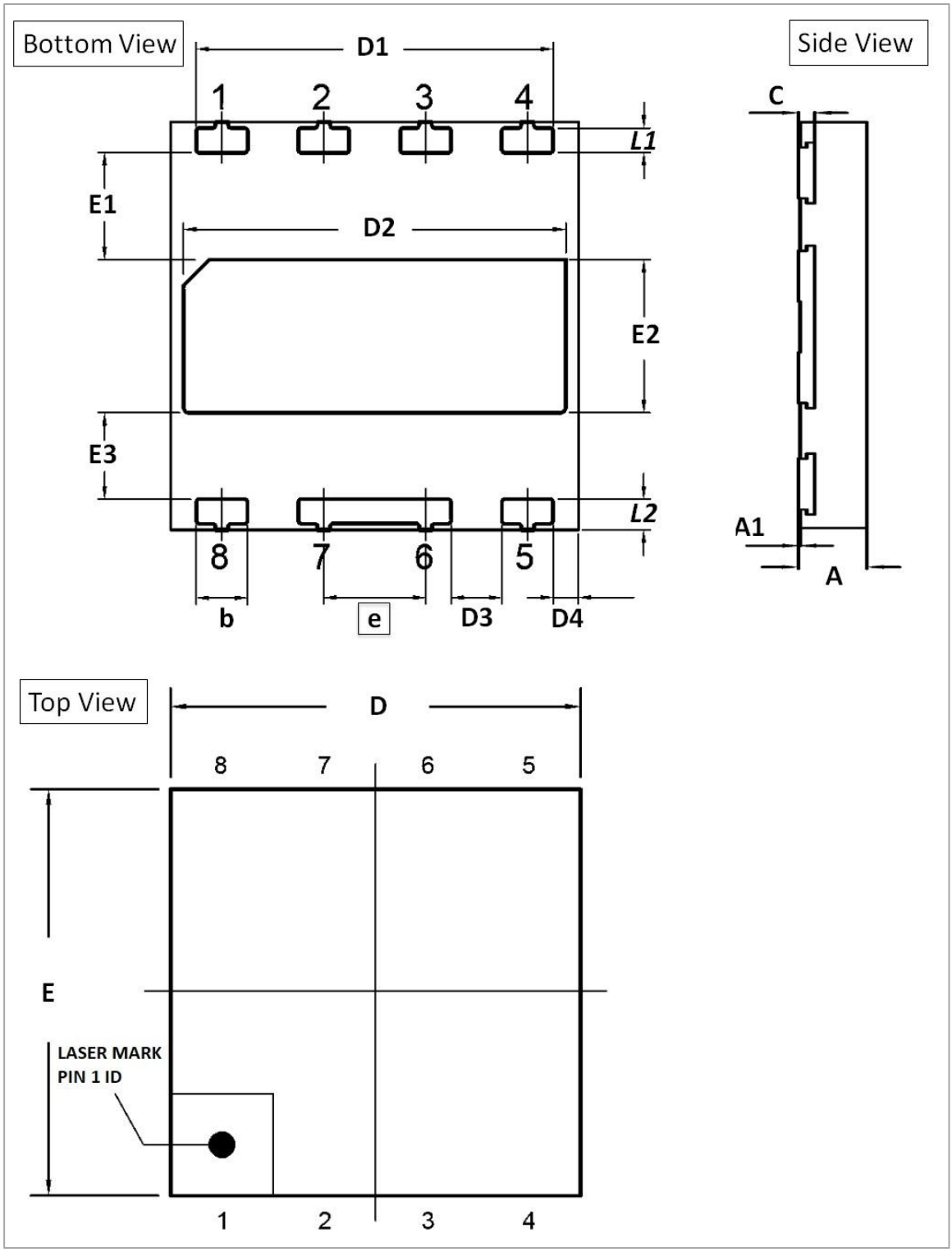


Fig 9. Power Dissipation Derating, Ptot



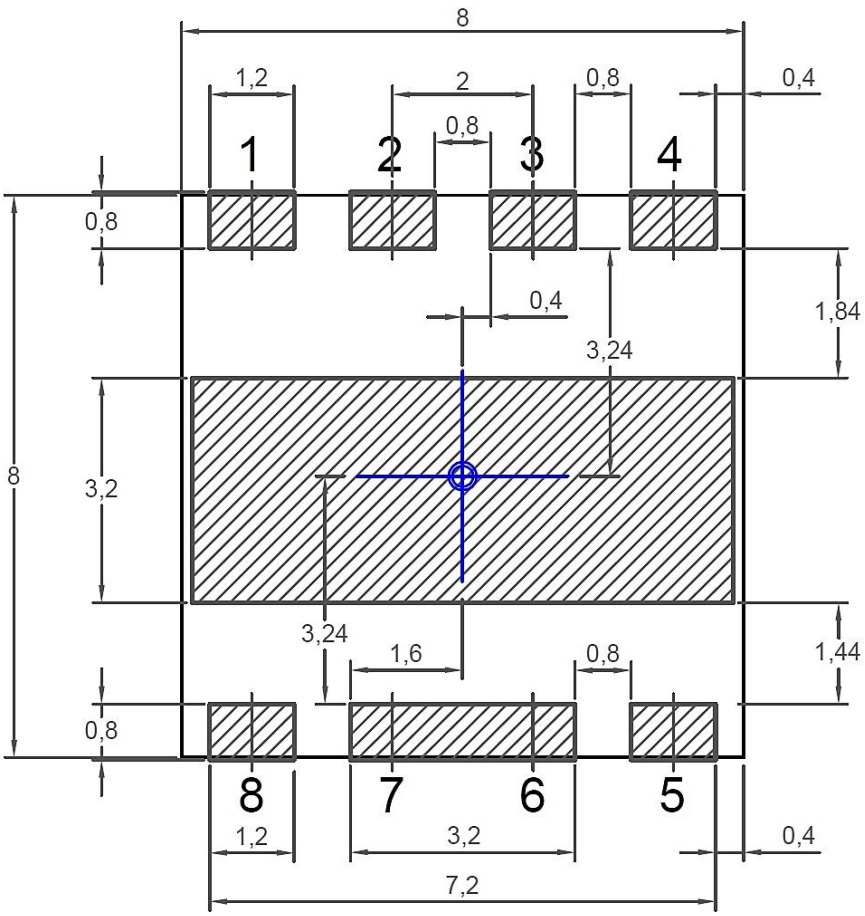
3- Package Outline Dimensions, DFN-8X8-8L (GR-8080-M)



➢ **Table 5 Dimension of DFN-8X8-8L (GR-8080-M)**

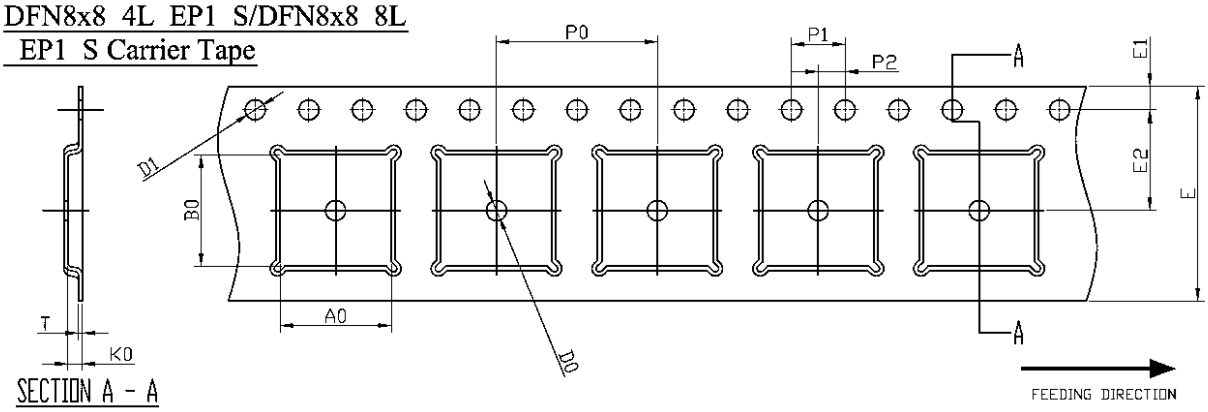
SYMBOL	DIMENSION (IN MM)			SYMBOL	DIMENSION (IN MM)		
	MINIMUM	NOMINAL	MAXIMUM		MINIMUM	NOMINAL	MAXIMUM
A	1.20	1.25	1.30	e	2.00 BSC		
A1	--	0.02	0.05	E	7.90	8.00	8.10
A2	0.203 REF			E1	2.00	2.10	2.20
b	0.95	1.00	1.05	E2	2.90	3.00	3.10
D	7.90	8.00	8.10	E3	1.60	1.70	1.80
D1	6.90	7.00	7.10	L1	0.38	0.48	0.58
D2	7.40	7.50	7.60	L2	0.50	0.60	0.70
D3	0.90	1.00	1.10				
D4	0.40	0.50	0.60				

DFN-8X8-8L (GR-8080-M) Recommended PCB Soldering Footprint



4- Tape and Reel Information

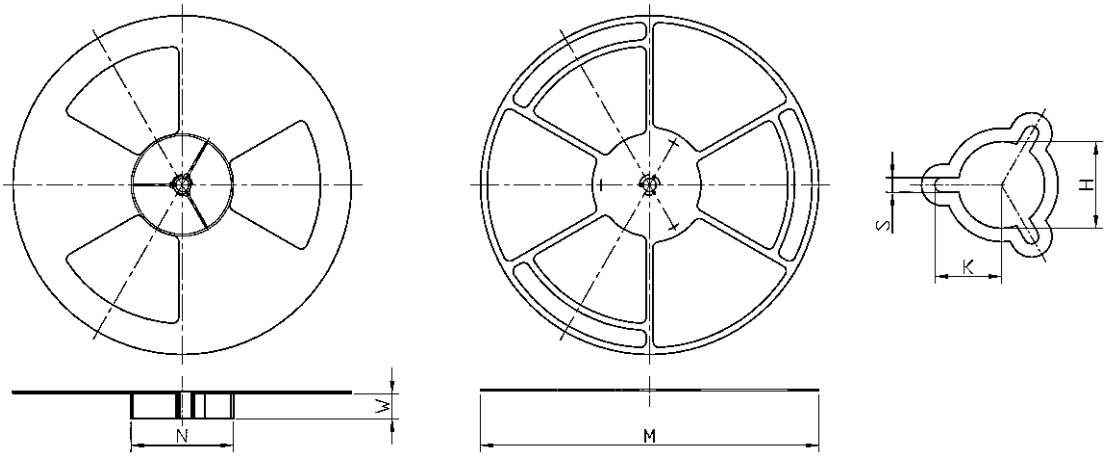
DFN8x8 4L EP1 S/DFN8x8 8L EP1 S Carrier Tape



UNIT: MM

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
DFN8x8 (16 mm)	8.30 ±0.10	8.30 ±0.10	1.10 ±0.10	1.50 MIN.	1.50 +0.10 0.00	16.00 ±0.30	1.75 ±0.10	7.50 ±0.10	12.00 ±0.10	4.00 ±0.10	2.00 ±0.10	0.30 ±0.10

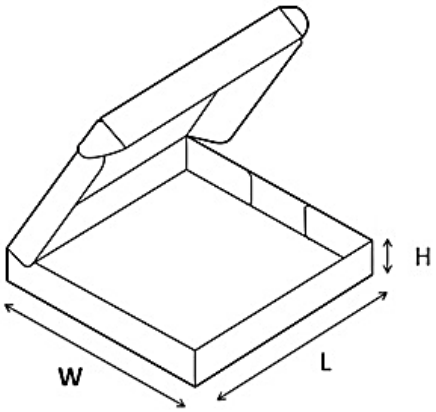
DFN8x8 4L EP1 S/DFN8x8 8L EP1 S Reel



UNIT: MM

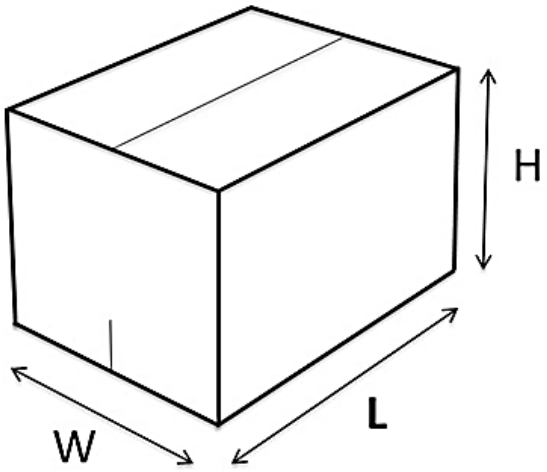
TAPE SIZE	REEL SIZE	M	N	W	H	K	S
16 mm	ø330	ø330.00 MAX.	ø100.00 MIN.	16.4 +2.0 −0.0	ø13.0 +0.5 −0.2	10.1 MIN.	1.5 MIN.

5- Box Dimensions



	Inner BOX, mm
W	340
L	360
H	50

1 Inner box contains 2500 components



	Outer Carton, mm
W	360
L	380
H	290

Each Carton contains 5 boxes,
Total of 12500 components

6- Change Log

Version	Date	Description
01	Nov 28, 2023	Initial version
02	Jan 22, 2026	Electrical characteristics revised.
03	April 16, 2026	Electrical characteristics revised

- ***Note:*** GaNrich semiconductor reserves the right to revise products and/or specifications without notice.