GR-04E001DJ: E-mode GaN Power Transistor (Preliminary)

Description

GR-04E001DJ is an enhancement mode GaN on Silicon power transistor. 04E001DJ provides high current and high operating speed which is suitable for DC to DC power supply applications.

Key Specifications

Part Number	GR-04E001DJ
V_{DSS}, min.	40V
$I_{DS,\ Pulse\ (25°C,\ TPULSE\ =\ 300\ \mu s)}$	337A
$R_{DS(ON)}$, typ. @Vgs=6V	1.1mΩ
Q_G, typ.	14.1nC

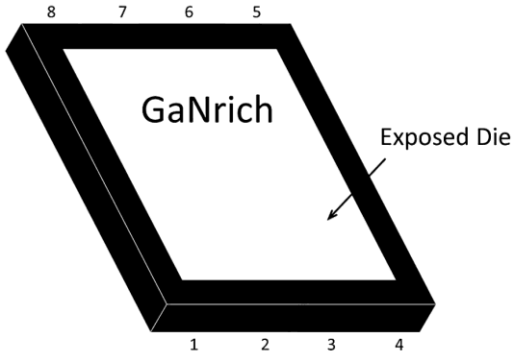
Features

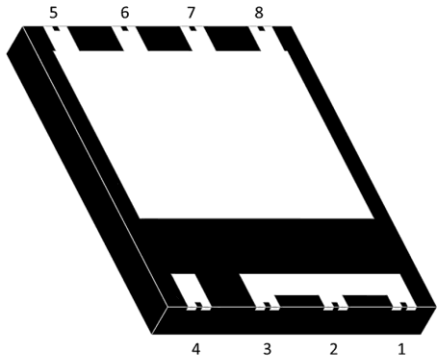
- 40V enhancement mode power transistor
- High operating frequency
- RDS(on) = Typ. 1.1 mΩ
- RoHS compliant
- Zero QRR.

Applications

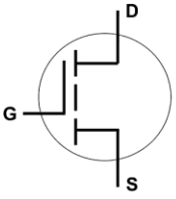
- High-Efficiency Synchronous Rectification (AC-DC/DC-DC)
- High-Frequency Multi-Topology DC-DC Converters
- High-Power Density DC-DC Power Modules
- Industrial & Automotive Motor Drives

GR-04E001DJ, RQFN-5x6-8L





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



1. Electrical Characteristics

➢ Table 1 Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-source voltage	40	V
$V_{(TR)DSS}$	Transient drain to source voltage[a]	48	V
V_{GSS}	Gate- source voltage	-6V ~ +6V	V
I_D	Drain current (continuous) at T_C = 25°C operation	108	A
	Drain current (continuous) at T_C = 100°C operation	73	A
$I_{D,Pulse}$	Pulsed drain current (pulse width: 300μs, Vgs=5V)[b]	337	A
T_J	Operating temperature	-40 to +150	°C
T_S	Storage temperature	-40 to +150	°C
MSL	Moisture sensitivity level	MSL3	

a. In off-state, spike duty cycle D<0.01, spike duration <1μs
b. Defined by product design and characterization. Value is not tested to full current in production

➢ Table 2 Thermal Characteristics

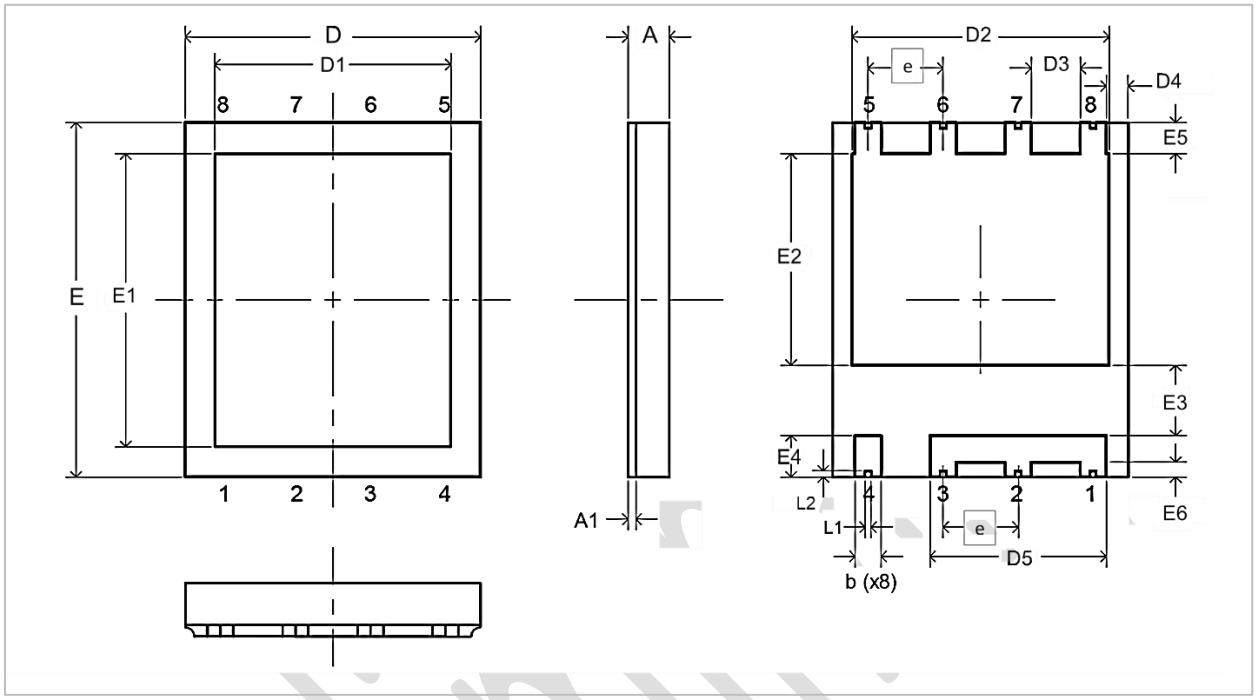
Symbol	Parameter	Value	Unit
$R_{\Theta JC\_Top}$	Thermal resistance junction-case, Top	0.50	°C/W
$R_{\Theta JC\_Bot}$	Thermal resistance junction-case, Bottom	0.50	°C/W
$R_{\Theta JA}$	Thermal resistance junction-ambient	60	°C/W

a. Tested in package DFN-5x6.

➢ **Table 3 Electrical Characteristics** (T_{CASE} = 25 °C unless otherwise stated)

Symbol	Parameter	Conditions	Values			Unit
			min.	typ.	max.	
V_{DSS}	Drain-source voltage	V_{GS}=0V, I_D=200uA	40	-	-	V
$V_{GS(th)}$	Gate threshold voltage	V_G =V_D , I_D=1mA	0.8	1.1	1.6	V
$R_{DS(on)}$	Drain-source on-resistance	V_{GS}=6V, I_D=20A	-	1.1	1.4	mΩ
I_{DSS}	Drain-source leakage current	V_{GS} =0V, V_{DS} =32V	-	5	400	uA
I_{GSS}	Gate-to-Source Forward Leakage current	V_{GS} = 5V, V_{DS} =0V	-	0.110	22	mA
	Gate-to-Source Forward Leakage current	V_{GS} = 5V, V_{DS} =0V, T_j=125°C	-	1.05	31.5	mA
	Gate-to-Source Reverse Leakage current	V_{GS} = -4V, V_{DS} =0V	-	0.105	3.15	mA
C_{ISS}	Input capacitance	V_{GS}= 0V, V_{DS}= 20V	-	2400	-	pF
C_{OSS}	Output capacitance		-	1150	-	
C_{RSS}	Reverse transfer capacitance		-	55	-	
Q_G	Gate charge	V_{GS}=5V, V_{DS}=20V, I_D =20A	-	14.1	-	nC
Q_{GS}	Gate-source charge	V_{DS}= 20V, I_D =20A	-	5.0	-	
Q_{GD}	Gate-drain charge		-	2.9	-	
Q_{OSS}	Output charge	V_{GS}= 0V, V_{DS}= 20V	-	90	-	nC
Q_{RR}	Source-Drain Recovery Charge	-	-	0	-	nC

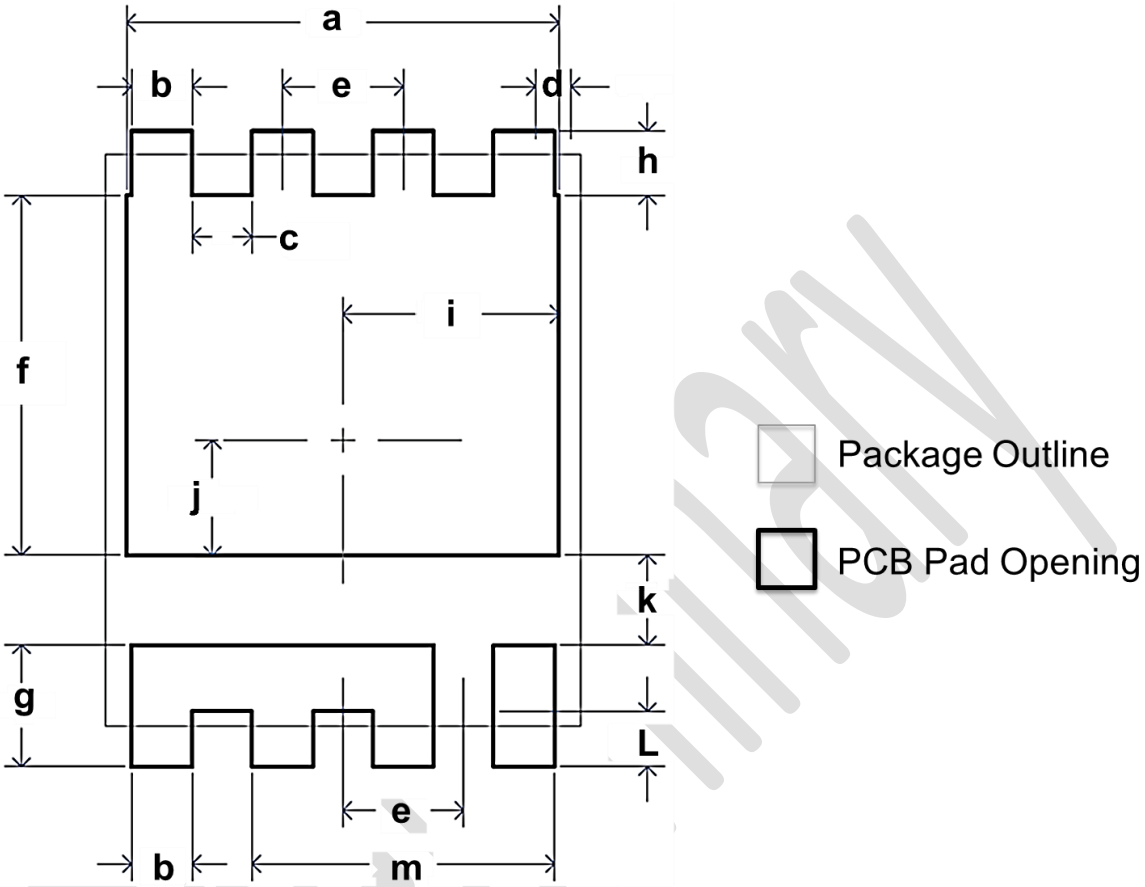
2. Package Outline Dimensions



➢ **Table 4 Dimension of GR-RQFN-5x6-8L**

SYMBOL	DIMENSION (IN MM)			SYMBOL	DIMENSION (IN MM)		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
A	---	---	0.70	**D5**	2.88	2.98	3.08
A1		0.13		**E1**		4.957 REF	
A2	0.42	0.45	0.48	**E2**	3.48	3.58	3.68
D	4.90	5.00	5.10	**E3**	1.09	1.19	1.29
E	2.90	6.00	3.10	**E4**	0.60	0.70	0.80
e		1.27 BSC		**E5**	0.43	0.53	0.63
b	0.34	0.44	0.54	**E6**	0.15	0.25	0.35
D1		3.994 REF		**L1**	0.05	0.10	0.20
D2	4.25	4.35	4.45	**L2**	0.05	0.10	0.20
D3	0.73	0.83	0.93				
D4	0.275	0.375	0.475				

3. Recommended PCB footprint



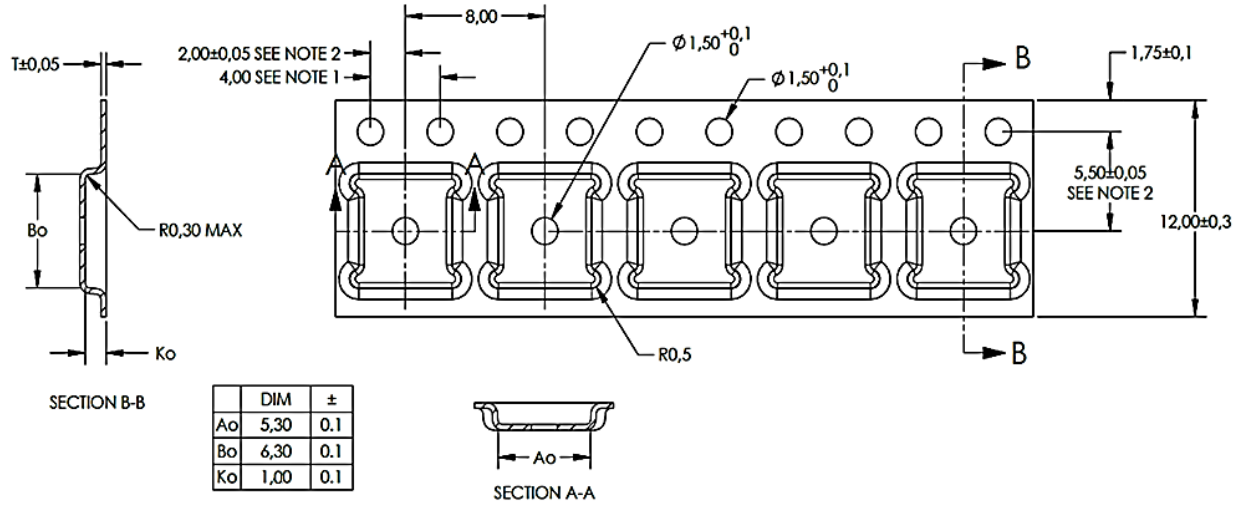
➢ **Table 5 PCB Footprint Dimension**

SYMBOL	DIMENSION	SYMBOL	DIMENSION
a	4.550	**h**	0.680
b	0.640	**i**	2.275
c	0.630	**j**	1.210
d	0.375	**k**	0.940
e	1.270	**L**	0.580
f	3.780	**m**	3.180
g	1.280	**-**	**-**

Notes:
(1) All dimensions are in mm.
(2) Drawing is not to Scale.

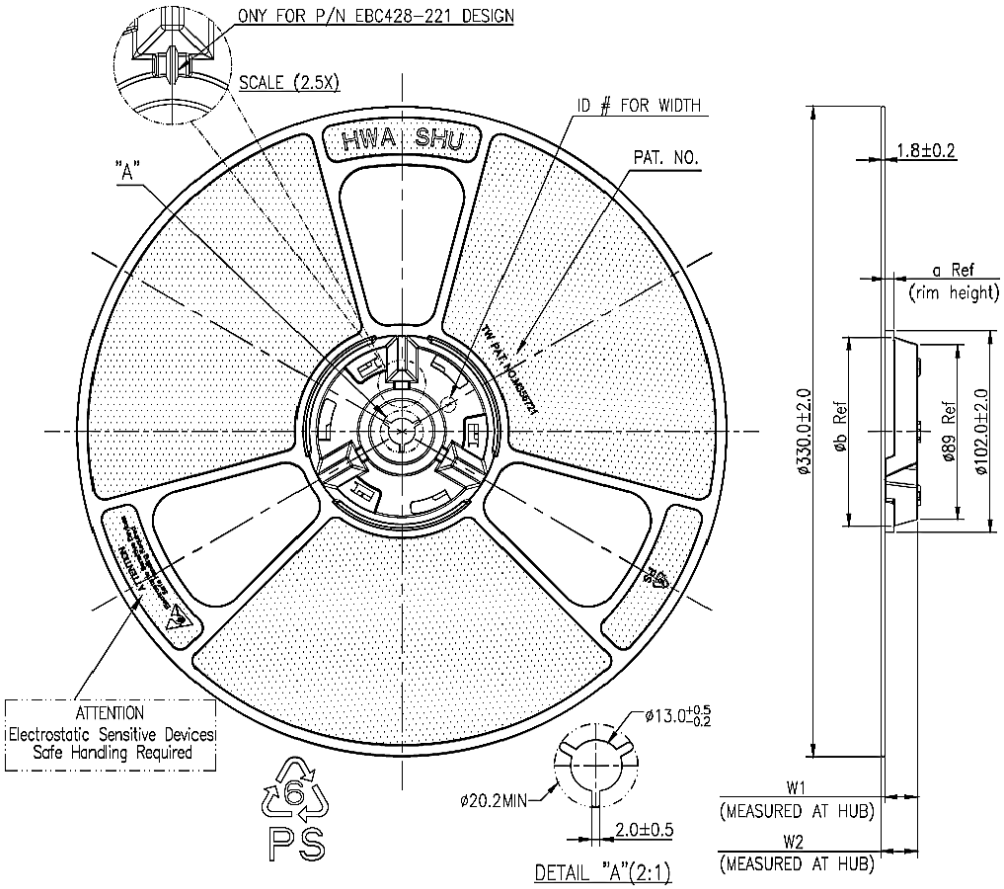
4. Tape & Reel Information

13” Reel, Carrier Tape W=12mm



	DIM	±
Ao	5,30	0.1
Bo	6,30	0.1
Ko	1,00	0.1

Unit: mm



5. Change Log

Version	Date	Description
0.1	April 16, 2026	Initial version

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