

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

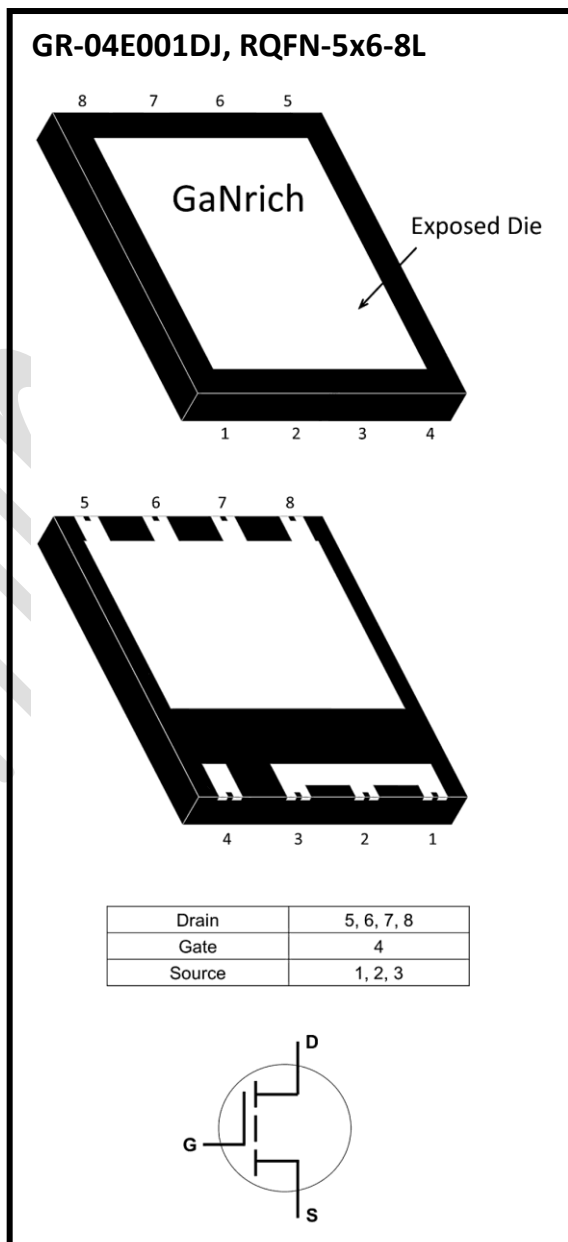
Part Number	GR-04E001DJ
V _{DSS} , min.	40V
I _{DS} , Pulse (25°C, TPULSE = 300 μs)	337A
R _{DS(ON)} , typ. @V _{gs} =6V	1.1mΩ
Q _G , typ.	14.1nC

Features

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

Applications

- Switch Mode Power Supplies (SMPS)
- DC-DC Converters
- Fast Battery Charging
- Appliance Motor Drives



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, V _{gs} =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**

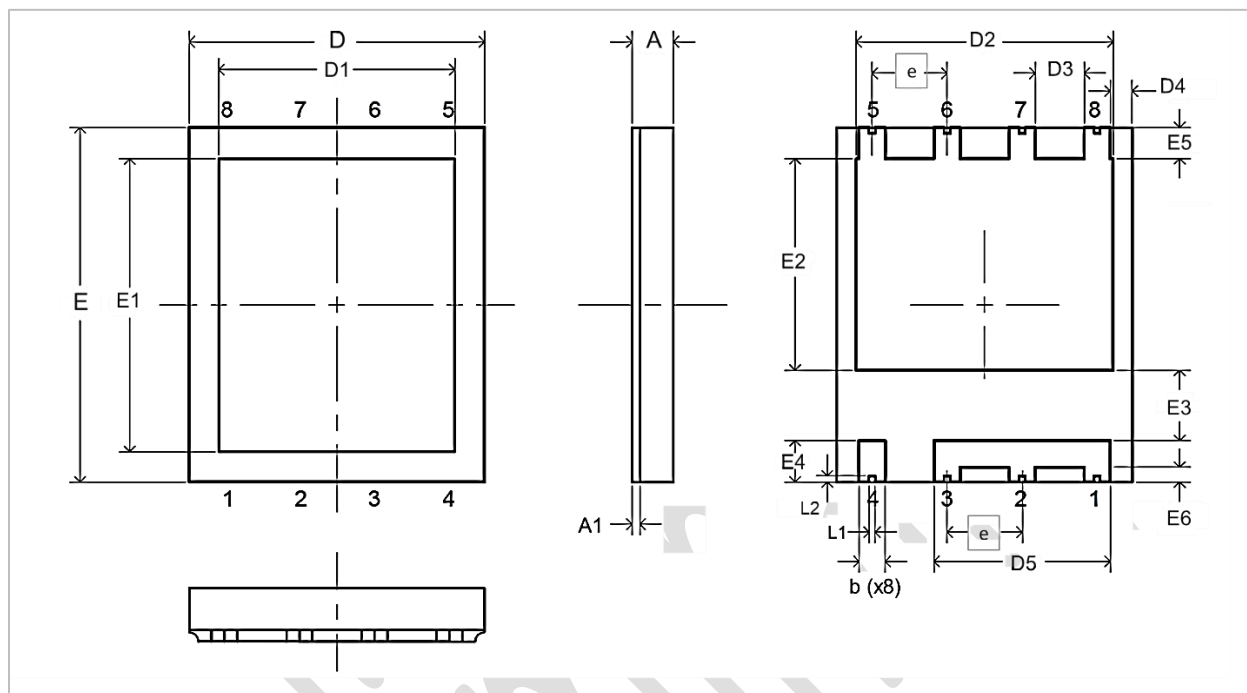
Symbol	Parameter	Value	Unit
R _{θJC_Top}	Thermal resistance junction-case, Top	0.50	°C/W
R _{θJC_Bot}	Thermal resistance junction-case, Bottom	0.50	°C/W
R _{θJA}	Thermal resistance junction-ambient	60	°C/W

- a. Tested in package DFN-5x6.

➤ **Table 3 Electrical Characteristics** ($T_{CASE} = 25\text{ }^{\circ}\text{C}$ unless otherwise stated)

Symbol	Parameter	Conditions	Values			Unit
			min.	typ.	max.	
V_{DSS}	Drain-source voltage	$V_{GS}=0V, I_D=200\mu A$	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	m Ω
I_{DSS}	Drain-source leakage current	$V_{GS} = 0V, V_{DS} = 32V$	-	5	400	μA
I_{GSS}	Gate-to-Source Forward Leakage current	$V_{GS} = 5V, V_{DS} = 0V$	-	0.110	22	mA
	Gate-to-Source Forward Leakage current	$V_{GS} = 5V, V_{DS} = 0V, T_j=125^{\circ}\text{C}$	-	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

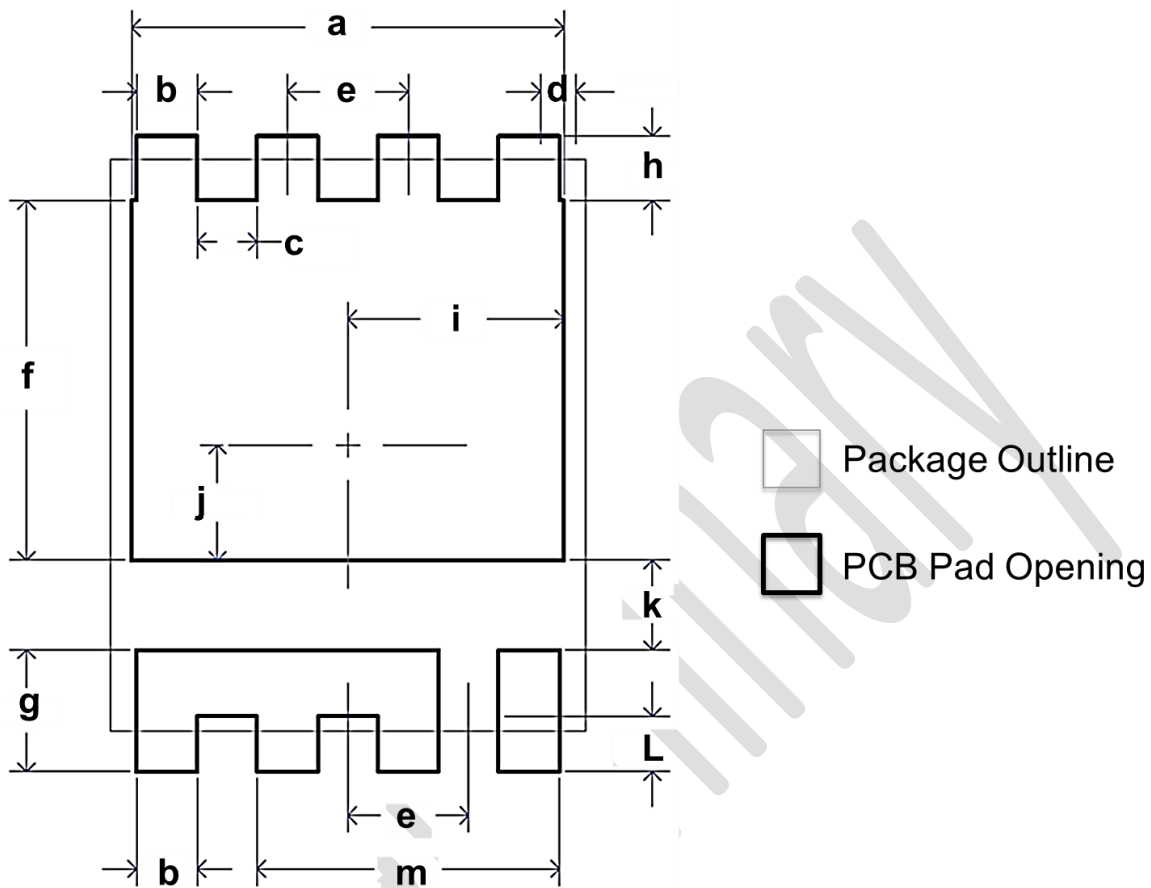
2. Package Outline Dimensions



➤ 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	-	-

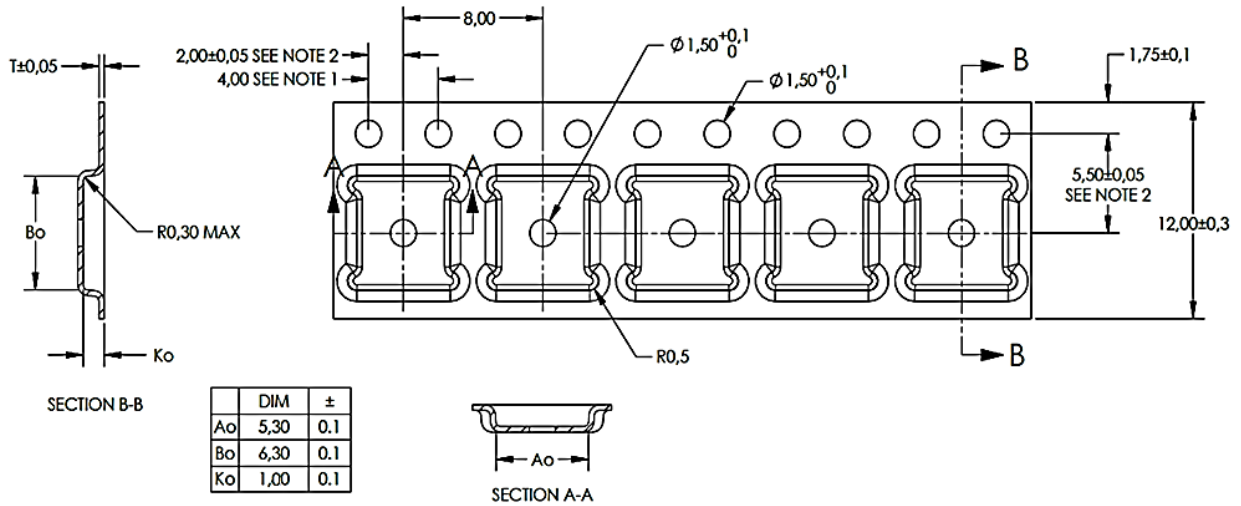
Notes:

(1) All dimensions are in mm.

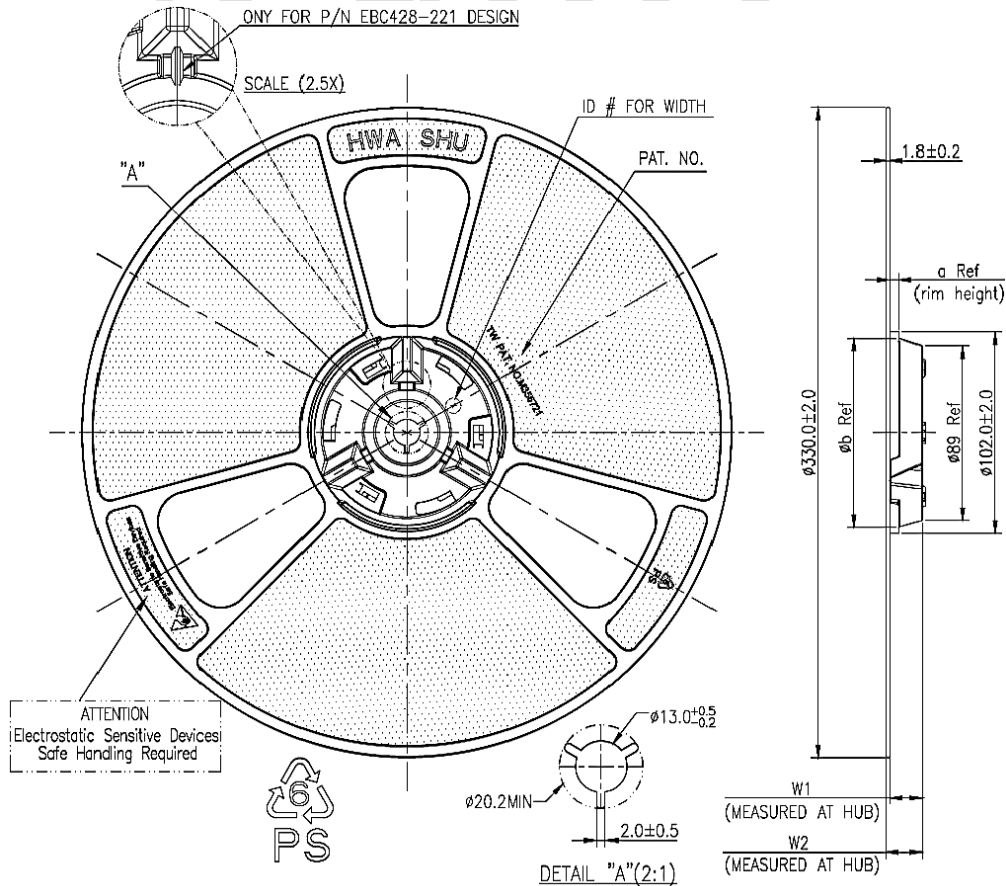
(2) Drawing is not to Scale.

4. Tape & Reel Information

13" Reel, Carrier Tape W=12mm



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.

Preliminary