

GR-10E003GJ: E-mode GaN Power Transistor

Description

GR-10E003GJ is an enhancement mode GaN on Silicon power transistor. 10E003GJ provides, high current and high operating speed which is suitable for DC to DC power supply applications.

Key Specifications

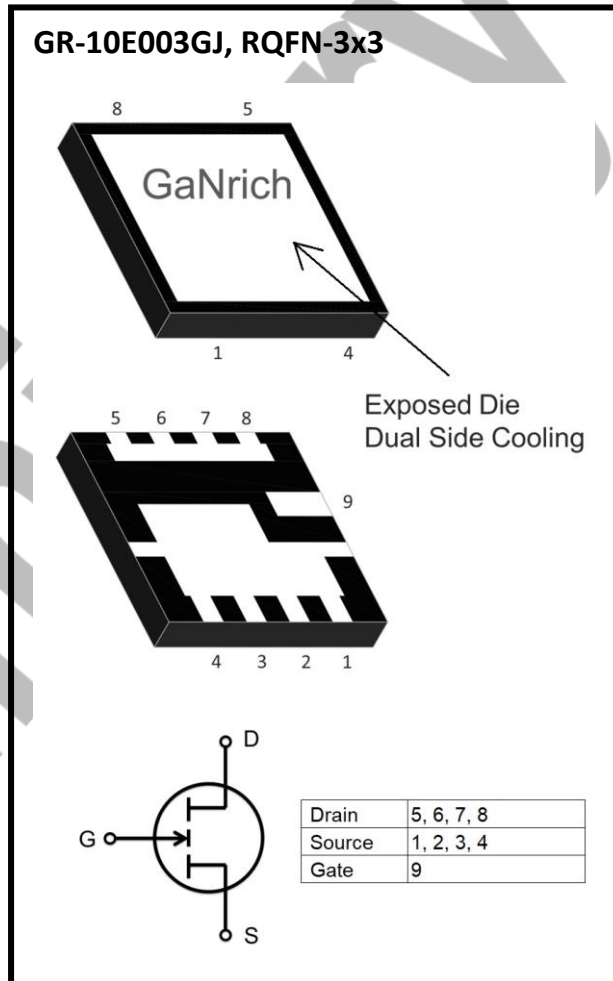
Part Number	GR-10E003GJ
V _{DSS} , min.	100V
I _{DS} , Pulse (25°C, TPULSE = 300 μs)	135A
R _{DS(ON)} , typ. @V _{GS} =5V	3.2mΩ
Q _G , typ.	9.5nC

Features

- 100 V enhancement mode power transistor
- High operating frequency
- R_{DS(on)} = Typ. 3.2 mΩ
- RoHS compliant

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	100	V
V _{(TR)DSS}	Transient drain to source voltage ^a	120	V
V _{GSS}	Gate- source voltage	-6V ~ +6V	V
I _D	Drain current (continuous) at T _C = 25°C operation	49.5	A
	Drain current (continuous) at T _C = 100°C operation	34.1	A
I _{D,Pulse}	Pulsed drain current (pulse width: 300μs, V _{gs} =5V) ^b	135	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**

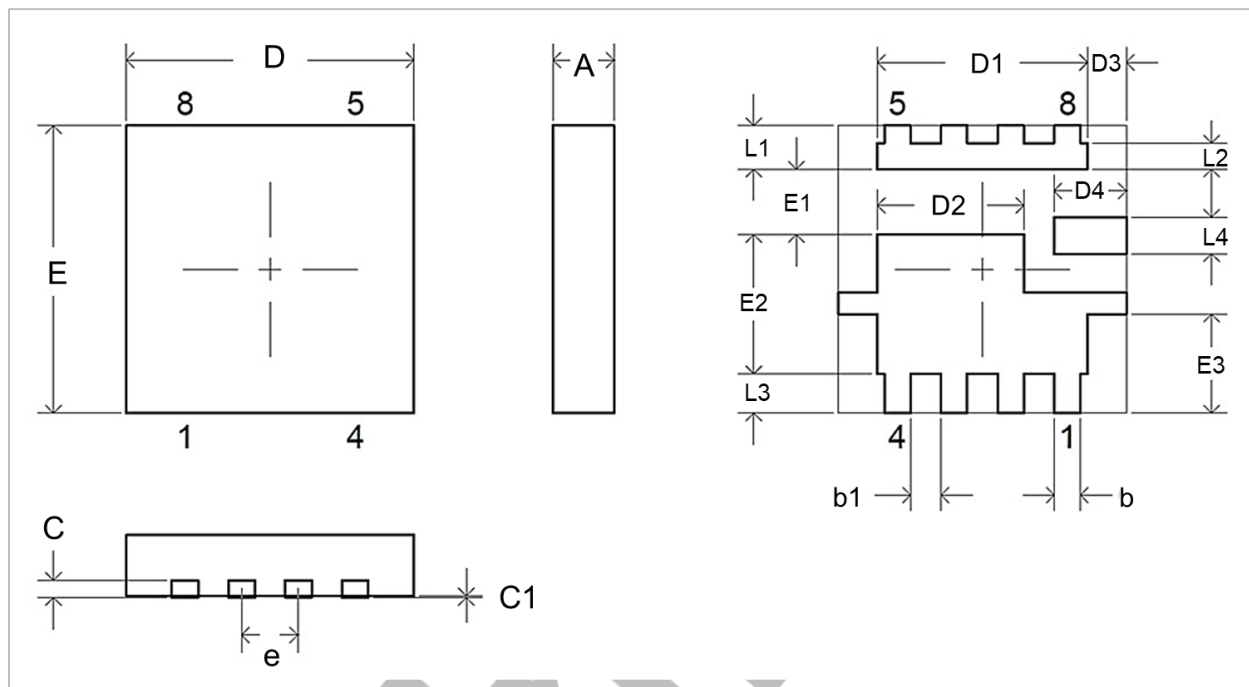
Symbol	Parameter	Value	Unit
R _{θJC_Top}	Thermal resistance junction-case, Top	0.65	°C/W
R _{θJC_Bot}	Thermal resistance junction-case, Bottom	0.80	°C/W
R _{θJA}	Thermal resistance junction-ambient	60	°C/W

- a. Tested in package DFN 3x3.

➤ **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	$V_{GS} = 0V, I_D = 150\mu A$	100	-	-	V
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}, I_D = 15mA$	0.8	1.2	1.8	V
$R_{DS(on)}$	Drain-source on-resistance	$V_{GS} = 5V, I_D = 50A$	-	3.2	4.2	$m\Omega$
I_{DSS}	Drain-source leakage current	$V_{DS} = 80V, V_{GS} = 0V$	-	5.0	400	μA
I_{GSS}	Gate-to-Source Forward Leakage current	$V_{GS} = +5V$	-	0.1	20	mA
	Gate-to-Source Forward Leakage current	$V_{GS} = +5V, T_J = 125^{\circ}\text{C}$	-	0.42	12.6	mA
	Gate-to-Source Reverse Leakage current	$V_{GS} = -4V$	-	0.08	2.4	mA
C_{ISS}	Input capacitance	$V_{DS} = 50V, V_{GS} = 0V$	-	895	-	pF
C_{OSS}	Output capacitance		-	435	-	
C_{RSS}	Reverse transfer capacitance		-	50	-	
Q_G	Gate charge	$V_{DS} = 50V, V_{GS} = 5V, I_D = 50A$	-	9.5	-	nC
Q_{GS}	Gate-source charge	$V_{DS} = 50V, I_D = 50A$	-	2.0	-	
Q_{GD}	Gate-drain charge		-	1.7	-	
Q_{OSS}	Output charge	$V_{DS} = 50V, V_{GS} = 0V$	-	56.3	-	
Q_{RR}	Source-Drain Recovery Charge	-	-	0	-	

2. Package Outline Dimensions



➤ Table 4 Dimension of GR-RQFN-3x3

SYMBOL	DIMENSION (IN MM)			SYMBOL	DIMENSION (IN MM)		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
A	---	---	0.70	D3	0.345	0.445	0.545
C	0.203 REF			D4	0.73	0.83	0.93
C1	---	---	0.05	E1	0.65	0.75	0.85
D	3.20	3.30	3.40	E2	1.50	1.60	1.70
E	3.20	3.30	3.40	E3	1.035	1.135	1.235
e	0.65 BSC			L1	0.40	0.50	0.60
b	0.20	0.30	0.40	L2	0.20	0.30	0.40
b1	0.25	0.35	0.45	L3	0.35	0.45	0.55
D1	2.31	2.41	2.51	L4	0.32	0.42	0.52
D2	1.58	1.68	1.78	---	---	---	---

4. Change Log

Version	Date	Description
0.1	March 28, 2025	Initial version
0.2	April 16, 2026	Electrical characteristics revised

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