

GR-15E005GJ: E-mode GaN Power Transistor

Description

GR-15E005GJ is an enhancement mode GaN on Silicon power transistor. 15E005GJ provides, high current and high operating speed which is suitable for DC to DC power supply applications.

Key Specifications

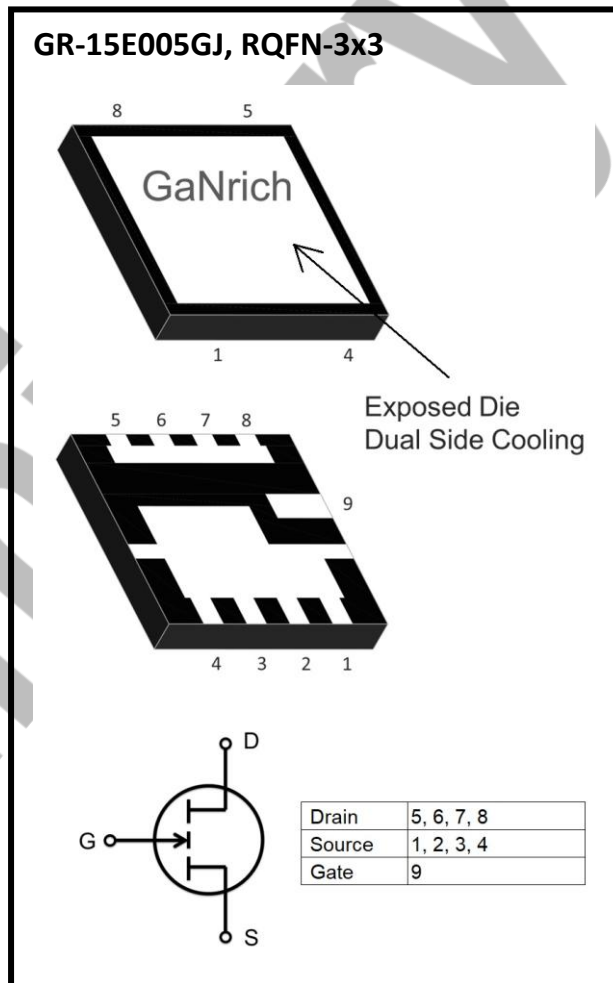
Part Number	GR-15E005GJ
V_{DS} , min.	150V
I_{DS} , Pulse (25°C, TPULSE = 300 μ s)	142A
$R_{DS(ON)}$, typ. @ $V_{GS}=5V$	5.3m Ω
Q_G , typ.	13.0nC

Features

- 150V enhancement mode power transistor
- High operating frequency
- $R_{DS(on)}$ = Typ. 5.3 m Ω
- RoHS compliant

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



1. Electrical Characteristics

➤ **Table 1 Absolute maximum ratings**

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-source voltage	150	V
$V_{(TR)DSS}$	Transient drain to source voltage ^a	180	V
V_{GSS}	Gate- source voltage	-6V ~ +6V	V
I_D	Drain current (continuous) at $T_C = 25^\circ\text{C}$ operation	45.9	A
	Drain current (continuous) at $T_C = 100^\circ\text{C}$ operation	31.7	A
$I_{D,Pulse}$	Pulsed drain current (pulse width: 300 μs , $V_{GS}=5\text{V}$) ^b	142.3	A
T_J	Operating temperature	-40 to +150	$^\circ\text{C}$
T_S	Storage temperature	-40 to +150	$^\circ\text{C}$
MSL	Moisture sensitivity level	MSL3	-

a. In off-state, spike duty cycle $D < 0.01$, spike duration $< 1\mu\text{s}$

b. Defined by product design and characterization. Value is not tested to full current in production

➤ **Table 2 Thermal Characteristics**

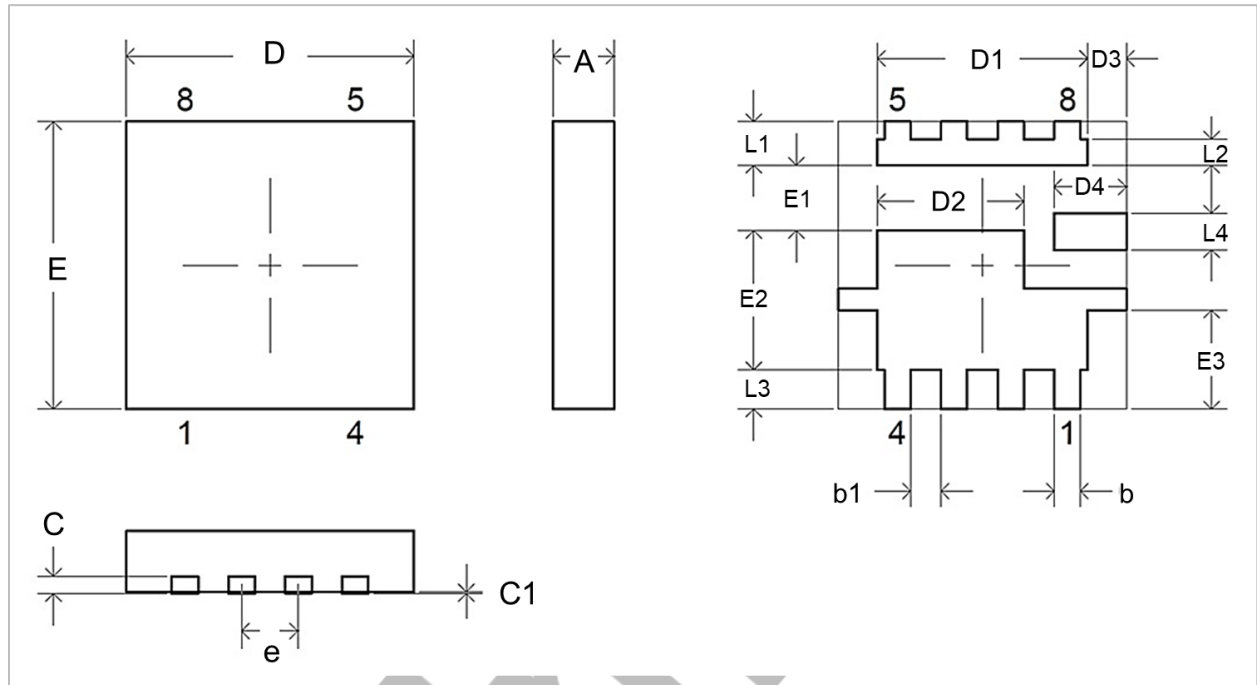
Symbol	Parameter	Value	Unit
$R_{\theta JC_Top}$	Thermal resistance junction-case, Top	0.65	$^\circ\text{C}/\text{W}$
$R_{\theta JC_Bot}$	Thermal resistance junction-case, Bottom	0.80	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal resistance junction-ambient	60	$^\circ\text{C}/\text{W}$

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	$V_{GS} = 0V, I_D = 150\mu A$	150	-	-	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	$V_{GS} = 5V, I_D = 50A$	-	5.3	6.9	$m\Omega$
I_{DSS}	Drain-source leakage current	$V_{DS} = 120V, V_{GS} = 0V$	-	5.0	400	μA
I_{GSS}	Gate-to-Source Forward Leakage current	$V_{GS} = +5V$	-	0.042	8.4	mA
	Gate-to-Source Forward Leakage current	$V_{GS} = +5V, T_J = 125^{\circ}\text{C}$	-	0.35	10.5	mA
	Gate-to-Source Reverse Leakage current	$V_{GS} = -4V$	-	0.034	1.02	mA
C_{ISS}	Input capacitance	$V_{DS} = 75V, V_{GS} = 0V$	-	565	-	pF
C_{OSS}	Output capacitance		-	275	-	
C_{RSS}	Reverse transfer capacitance		-	31.5	-	
Q_G	Gate charge	$V_{DS} = 75V, V_{GS} = 5V, I_D = 50A$	-	13.0	-	nC
Q_{GS}	Gate-source charge	$V_{DS} = 75V, I_D = 50A$	-	3.0	-	
Q_{GD}	Gate-drain charge		-	2.0	-	
Q_{OSS}	Output charge	$V_{DS} = 75V, V_{GS} = 0V$	-	34	-	
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	0.730	0.830	0.930
C1	---	---	0.05	E1	0.650	0.750	0.850
D	3.20	3.30	3.40	E2	1.500	1.600	1.700
E	3.20	3.30	3.40	E3	1.035	1.135	1.235
e	0.65 BSC			L1	0.400	0.500	0.600
b	0.20	0.30	0.40	L2	0.200	0.300	0.400
b1	0.25	0.35	0.45	L3	0.350	0.450	0.550
D1	2.31	2.41	2.51	L4	0.320	0.420	0.520
D2	1.58	1.68	1.78	---	---	---	---

Technical drawing of a mechanical part with dimensions and labels 1 through 8. The drawing shows a cross-section of a part with a base and a top flange. The dimensions are as follows:

- Overall width: 2.460
- Overall height: 0.985
- Top flange width: 2.300
- Top flange height: 0.300
- Base width: 0.650
- Base height: 0.675
- Internal width: 1.100
- Internal height: 0.425
- Internal width (right): 0.150
- Internal height (right): 0.470
- Internal width (left): 0.395
- Internal height (left): 0.350

Labels 1 through 8 are placed on the drawing to identify specific features:

- 1: Bottom left corner
- 2: Bottom right corner
- 3: Top left corner
- 4: Top right corner
- 5: Internal width (right)
- 6: Internal height (right)
- 7: Internal width (left)
- 8: Internal height (left)

*Not to Scale

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.