

GR-15E003UG: E-mode GaN Power Transistor

Description

GR-15E003UG is an enhancement mode GaN on Silicon power transistor. GR-15E003UG provides, high current and high operating speed which is suitable for DC to DC power supply applications.

Key Specifications

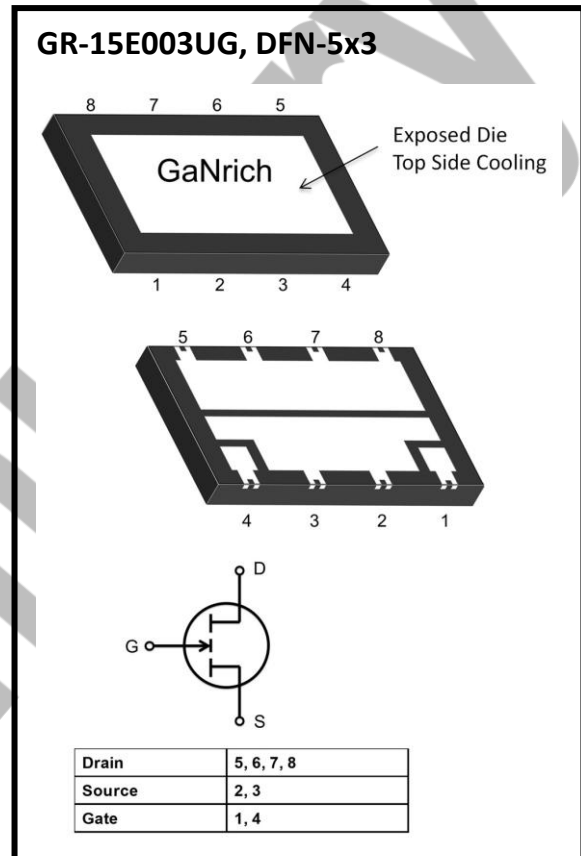
Part Number	GR-15E003UG
$V_{DS, min.}$	150V
$I_{DS, Pulse}$ (25°C, TPULSE = 300 μs)	263A
$R_{DS(ON), typ. @Vgs=5V}$	3.1mΩ
$Q_G, typ.$	13.2nC

Features

- 150V enhancement mode power transistor
- High operating frequency
- $R_{DS(on)} = Typ. 3.1m\Omega$
- Dual-side cooled package
- HS 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	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	85	A
	Drain current (continuous) at $T_C = 100^\circ\text{C}$ operation	58	A
$I_{D,Pulse}$	Pulsed drain current (pulse width: 300 μs , $V_{gs}=5\text{V}$) ^b	263	A
T_J	Operating temperature	-40 to +150	$^\circ\text{C}$
T_S	Storage temperature	-40 to +150	$^\circ\text{C}$

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**

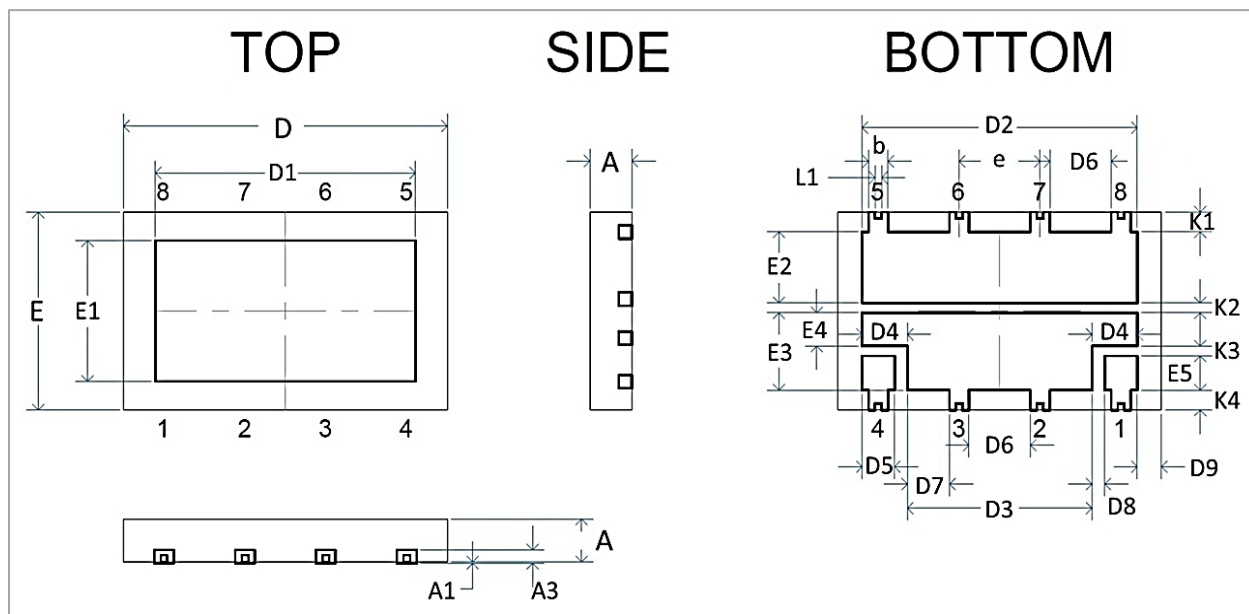
Symbol	Parameter	Value	Unit
$R_{\theta JC_Top}$	Thermal resistance junction-case, Top	0.50	$^\circ\text{C}/\text{W}$
$R_{\theta JC_Bot}$	Thermal resistance junction-case, Bottom	0.50	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal resistance junction-ambient	60	$^\circ\text{C}/\text{W}$

a. Tested in package DFN 5x3.

➤ **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	$V_{GS}=0V, I_D=200\mu A$	150	-	-	V
$V_{GS(th)}$	Gate threshold voltage	$V_G = V_D, I_D=7mA$	0.8	1.1	1.6	V
$R_{DS(on)}$	Static drain-source on-resistance	$V_{GS}=5V, I_D=30A$	-	3.1	4.0	m Ω
I_{DSS}	Drain-source leakage current	$V_{GS} = 0V, V_{DS} = 120V$	-	5.0	400	μA
I_{GSS}	Gate-to-Source Forward Leakage current	$V_{GS} = 5V, V_{DS} = 0V$	-	0.07	14	mA
	Gate-to-Source Forward Leakage current	$V_{GS} = 5V, V_{DS} = 0V, T_j=125^{\circ}\text{C}$	-	0.6	18	mA
	Gate-to-Source Reverse Leakage current	$V_{GS} = -4V, V_{DS} = 0V$	-	1.5	45	mA
C_{ISS}	Input capacitance	$V_{GS}= 0V, V_{DS}= 75V$	-	1324	-	pF
C_{OSS}	Output capacitance		-	578	-	
C_{RSS}	Reverse transfer capacitance		-	21.9	-	
Q_G	Gate charge	$V_{GS}=5V, V_{DS}=75V, I_D = 30A$	-	13.2	-	nC
Q_{GS}	Gate-source charge	$V_{DS}= 75V, I_D = 30A$	-	5.2	-	
Q_{GD}	Gate-drain charge		-	2.3	-	
Q_{OSS}	Output charge	$V_{GS}= 0V, V_{DS}= 75V$	-	53.2	-	
Q_{RR}	Reverse recovery charge	-	-	0	-	

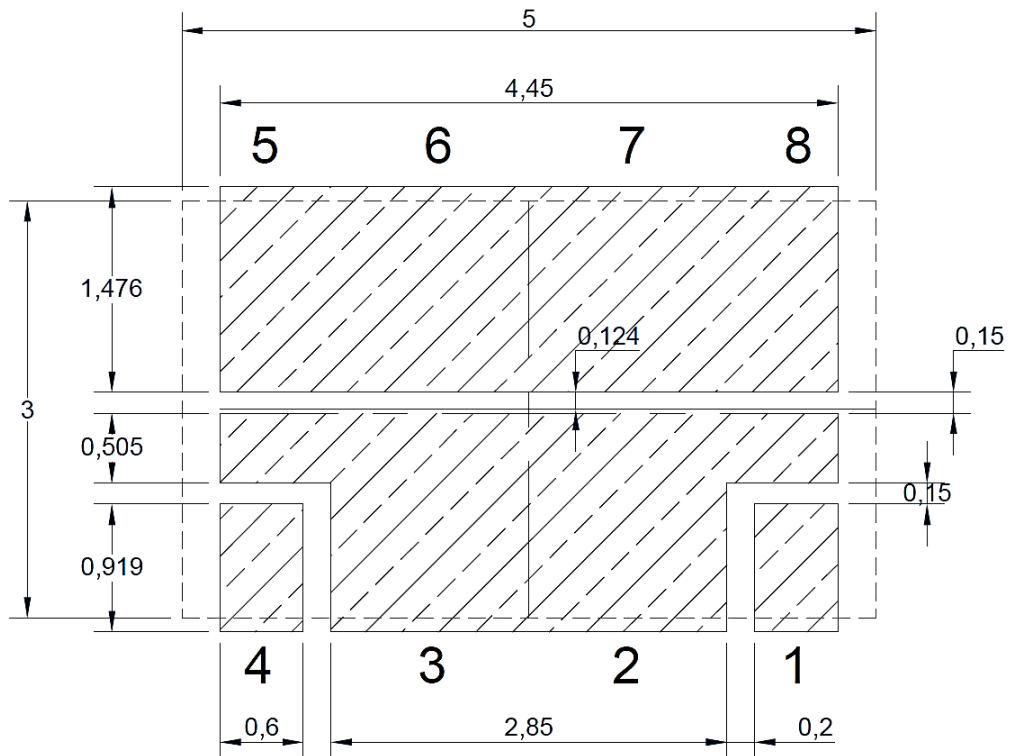
2. Package Outline Dimensions



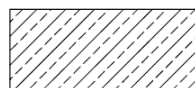
➤ Table 4 Dimension of GR-DFN-5x3-

SYMBOL	DIMENSION (MM)			SYMBOL	DIMENSION (IN MM)		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
A	0.60	0.65	0.70	D7	0.55	0.65	0.75
A2	--	0.02	0.05	D8	0.10	0.20	0.30
A3	0.203 REF			D9	0.365	0.375	0.385
D	4.90	5.00	5.10	E1	2.132 REF		
E	2.90	3.00	3.10	E2	0.976	1.076	1.176
e	1.25 BSC			E3	1.074	1.174	1.274
b	0.20	0.30	0.40	E4	0.405	0.505	0.605
D1	4.018 REF			E5	0.419	0.519	0.619
D2	4.15	4.25	4.35	K1	0.20	0.30	0.40
D3	2.75	2.85	2.95	K2	0.05	0.15	0.25
D4	0.60	0.70	0.80	K3	0.05	0.15	0.25
D5	0.40	0.50	0.60	K4	0.20	0.30	0.40
D6	0.85	0.95	1.05				

3. Recommended PCB Soldering footprint



Package outlines



PCB pad openings

4. Change Log

Version	Date	Description
0.1	January 12, 2026	Initial version
0.2	April 16, 2026	Electrical characteristics revised

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