

GR-04E001UG: E-mode GaN Power Transistor

Description

GR-04E001UG is an enhancement mode GaN on Silicon power transistor. GR-04E001UG provides, high current and high operating speed which is suitable for DC to DC power supply applications.

Key Specifications

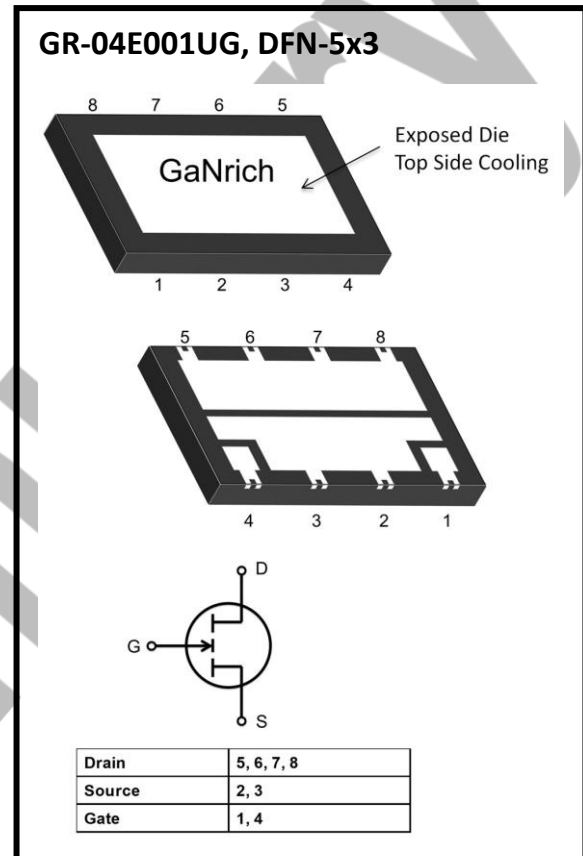
Part Number	GR-04E001UG
V_{DS} , min.	40V
I_{DS} , Pulse (25°C, TPULSE = 10μs)	304A
$R_{DS(ON)}$, typ. @Vgs=5V	1.2mΩ
Q_G , typ.	17.1nC

Features

- 40V enhancement mode power transistor
- High operating frequency
- $R_{DS(on)}$ = Typ. 1.2 mΩ
- Dual-side cooled package
- HS 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_{DS}	Drain-source voltage	40	V
$V_{(TR)DS}$	Transient drain to source voltage ^a	48	V
V_{GS}	Gate- source voltage	-6V ~ +6V	V
I_D	Drain current (continuous) at $T_C = 25^{\circ}\text{C}$ operation	97	A
	Drain current (continuous) at $T_C = 100^{\circ}\text{C}$ operation	66	A
$I_{D,Pulse}$	Pulsed drain current (pulse width: 300 μs , $V_{GS}=5\text{V}$) ^b	304	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**

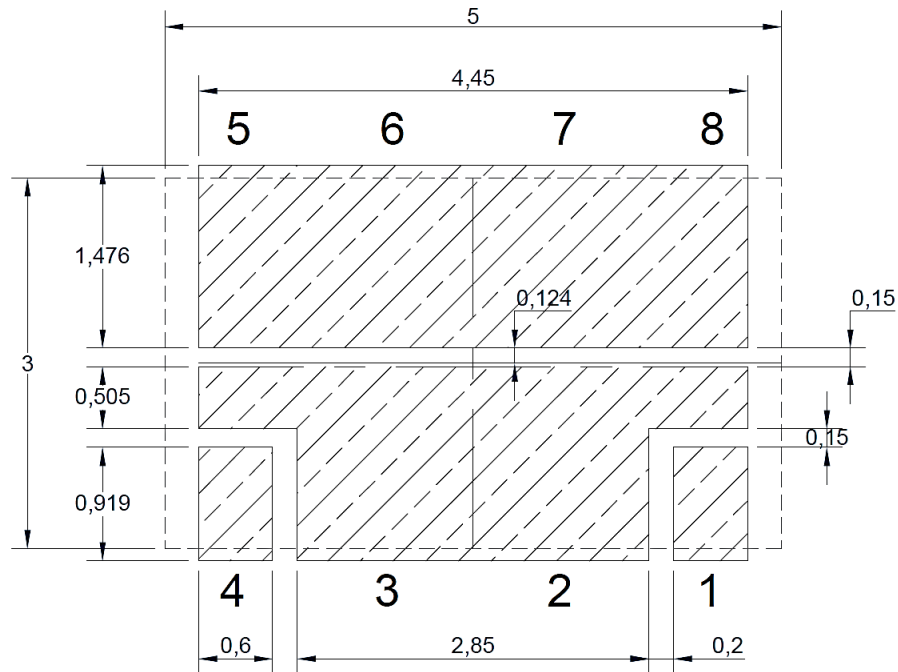
Symbol	Parameter	Value	Unit
$R_{\theta JC_Top}$	Thermal resistance junction-case, Top	0.50	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC_Bot}$	Thermal resistance junction-case, Bottom	0.50	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal resistance junction-ambient	60	$^{\circ}\text{C}/\text{W}$

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	$V_{GS} = 0V, I_D = 250\mu A$	40	-	-	V
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}, I_D = 1mA$	0.8	1.1	1.6	V
$R_{DS(on)}$	Static drain-source on-resistance	$V_{GS} = 5V, I_D = 20A$	-	1.2	1.6	$m\Omega$
I_{DSS}	Drain-source leakage current	$V_{DS} = 32V, V_{GS} = 0V$	-	5.0	400	μA
I_{GSS}	Gate-to-Source Forward Leakage current	$V_{GS} = +5V, T_J = 25^{\circ}\text{C}$	-	0.1	20	mA
	Gate-to-Source Forward Leakage current	$V_{GS} = +5V, T_J = 125^{\circ}\text{C}$	-	0.95	28.4	mA
	Gate-to-Source Reverse Leakage current	$V_{GS} = -4V, T_J = 25^{\circ}\text{C}$	-	0.09	2.8	mA
C_{ISS}	Input capacitance	$V_{DS} = 20V, V_{GS} = 0V$	-	1392	-	pF
C_{OSS}	Output capacitance		-	578	-	
C_{RSS}	Reverse transfer capacitance		-	50	-	
Q_G	Gate charge	$V_{DS} = 20V, V_{GS} = 5V, I_D = 20A$	-	17.1	-	nC
Q_{GS}	Gate-source charge	$V_{DS} = 20V, I_D = 20A$	-	6.4	-	
Q_{GD}	Gate-drain charge		-	2.9	-	
Q_{OSS}	Output charge	$V_{DS} = 20V, V_{GS} = 0V$	-	39.5	-	
Q_{RR}	Reverse recovery charge	-	-	0	-	

4. Recommended PCB Soldering footprint



Package outlines



PCB pad openings

5. 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.