GaNPower International Inc.

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230 -3410 LOUGHEED HWY
VANCOUVER, BC, V5M 2A4 CANADA

GPIHV7DK

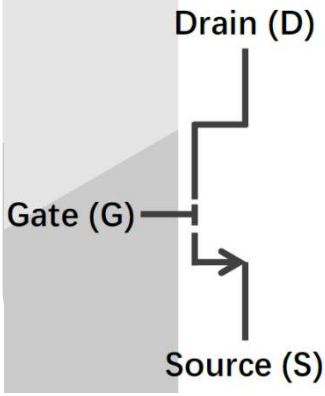
N-channel 1200V 7A GaN Power HEMT in TO252 Package

Datasheet version 1.1: Preliminary

Features

BV_{dss}	R_{dson}	I_{ds}	Q_g
1200 V	158 mΩ	7 A	3.1 nC

- Ultra-low R_{DS}(on)
- High dv/dt capability
- Extremely low input capacitance
- Zero Qrr
- Outstanding switching performance
- Low Profile



Applications

- Switching Power Applications
- Server and Telecom Power Application
- EV OBC and DC-DC Converters
- UPS, Inverters, PV

Description

These devices are N-channel 1200 V Power GaN HEMTs based on proprietary E-mode GaN on silicon technology. The resulting product has extremely low on state resistance, very low input capacitance and zero reverse recovery charge making it especially suitable for applications which require superior power density, ultra-high switching frequency and outstanding efficiency.

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Device Characteristics

Static Parameters				Test data			
	Parameters		**Conditions**	**Min**	**Typical**	**Max**	**Unit**
1	$V_{gs(TH)}$	Gate threshold voltage	V_{ds}=V_{gs} Id=2.5mA	1.2	1.4	1.7	V
2	BV_{dss}	Drain-Source breakdown voltage	V_{gs}=0V I_d < 14 μA (T=25 °C)		1200		V
3	I_{dss}	Zero gate voltage drain current, T_C = 25℃	V_{gs}=0V V_{ds}=1200V		1.4	14	μA
4	I_{gss}	Gate-Source Leakage	V_{gs} = 6V V_{ds} = 0V		15	700	μA
5	R_{dson}	Static drain-source on resistance, T_C = 25℃	V_{gs}=6V I_d=2.5A		158	250	mΩ
6	V_{sd}	Reverse conduction voltage	I_{sd}=1A V_{gs}=0V	1.50	2.50	3.0	V
7	R_g	Gate resistance	f=25Mhz Open drain		2.6		Ω
Dynamic Parameters				**Test data**			
	Parameters		**Conditions**	**Min**	**Typical**	**Max**	**Unit**
1	C_{iss}	Input capacitance	V_{gs}=0V V_{ds}=700V f=1MHz		90		pf
	C_{oss}	Output capacitance			27.2		pf
	C_{rss}	Reverse transfer capacitance			4.9		pf
3	Q_g	Gate charge	V_{ds}=400V I_d=9A V_{gs}=6V		3.1		nC
	Q_{gs}	Gate to source charge			0.5		nC
	Q_{gd}	Gate to drain charge			0.7		nC
2	Q_{rr}	Reverse recovery charge			0		nC
Switching Performance				**Test data**			
	Parameters		**Conditions**	**Min**	**Typical**	**Max**	**Unit**
1	$t_{d(on)}$	Turn-on delay time	V_{ds}=800V I_d=2A R_g=22/2Ω V_{gs}=-3/6V		6		ns
2	t_r	Rise time			12		ns
3	$t_{d(off)}$	Turn-off delay time			16		ns
4	t_f	Fall time			12		ns

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Absolute Max. Ratings

	Symbols	Parameters	Value	Unit
1	$V_{DS\text{-}max}$	Breakdown voltage transient @ T_{case}=25°C	1500	V
	$V_{DS\text{-}max}$	Breakdown voltage transient @ T_{case}=125°C	1250	V
2	$V_{GS\text{-}max}$	Gate to source max. voltage @ T_{case}=25°C	-12 to +7.5	V
3	$I_{ds\text{-}max}$	Drain to source DC current @ T_{case}=25°C	7	A
4	$I_{ds\text{-}max}$	Drain to source DC current @ T_{case}=100°C	5	A
5	$dv/dt_{\text{-}max}$	Drain to source voltage slew rate	150	V/ns
6	$T_{J\text{-}max}$	Max junction temperature	150	°C
7	$T_{S\text{-}storage}$	Storage temperature	-55 to 150	°C

Thermal and Soldering Characteristics (Typical)

	Symbols	Parameters	Value	Unit
1	R_{thJC}	Thermal resistance (junction to case)	1.25	°C /W
2	R_{thJA}	Thermal resistance (junction to ambient)	60	°C /W
2	T_{solder}	Reflow soldering temperature	260	°C

Ordering

Order Code	Package Type	Packaging Method	Qty
GPIHV7DK	TO-252		

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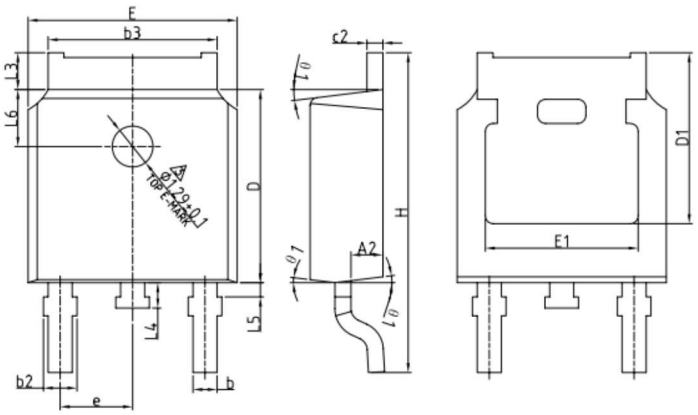
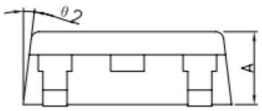
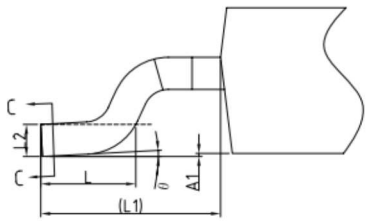
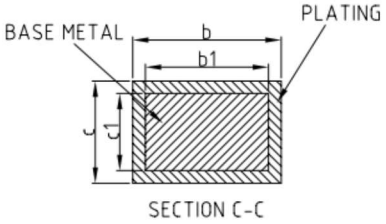
Package Information









COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

	SYMBOL	MIN	NOM	MAX
	A	2.20	2.30	2.38
	A1	0	–	0.10
⚠	A2	0.90	1.01	1.10
	b	0.72	–	0.85
	b1	0.71	0.76	0.81
	b2	0.72	–	0.90
	b3	5.13	5.33	5.46
	c	0.47	–	0.60
	c1	0.46	0.51	0.56
	c2	0.47	–	0.60
	D	6.00	6.10	6.20
	D1	5.25	–	–
	E	6.50	6.60	6.70
	E1	4.70	–	–
	e	2.186	2.286	2.386
	H	9.80	10.10	10.40
	L	1.40	1.50	1.70
	L1	2.90REF		
	L2	0.51BSC		
	L3	0.90	–	1.25
	L4	0.60	0.80	1.00
	L5	0.15	–	0.75
	L6	1.80REF		
	θ	0°	–	8°
⚠	θ1	5°	7°	9°
⚠	θ2	5°	7°	9°

NOTES:
ALL DIMENSIONS REFER TO JEDEC STANDARD TO-252 AA DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

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Further Information

Important Notice-Unless expressly approved in writing by an authorized representative of GaNPower, GaNPopwer components are not designed, authorized or warranted for use in lifesaving, life sustaining, military, aircraft, or space applications, nor in products or systems where failure or malfunction may result in personal injury, death, or property or environmental damage. The information given in this document shall not in any event be regarded as a guarantee of performance. GaNPower hereby disclaims any or all warranties and liabilities of any kind, including but not limited to warranties of non-infringement of intellectual property rights. All other brand and product names are trademarks or registered trademarks of their respective owners. Information provided herein is intended as a guide only and is subject to change without notice. The information contained herein or any use of such information does not grant, explicitly, or implicitly, to any party any patent rights, licenses, or any other intellectual property rights. All rights reserved.

Data Source– Data here are based on recent tests but all parameters may not be up to date. Actual final test data from packaging production are available for selected customers upon request.