

## GPIHV5DK

### N-channel 1200V 5A GaNPower HEMT in TO252 Package

Datasheet version 1.4: Preliminary

### Features

$BV_{dss}$	$R_{dson}$	$I_{ds}$	$Q_g$
1200 V	260 m $\Omega$	5 A	1.9 nC

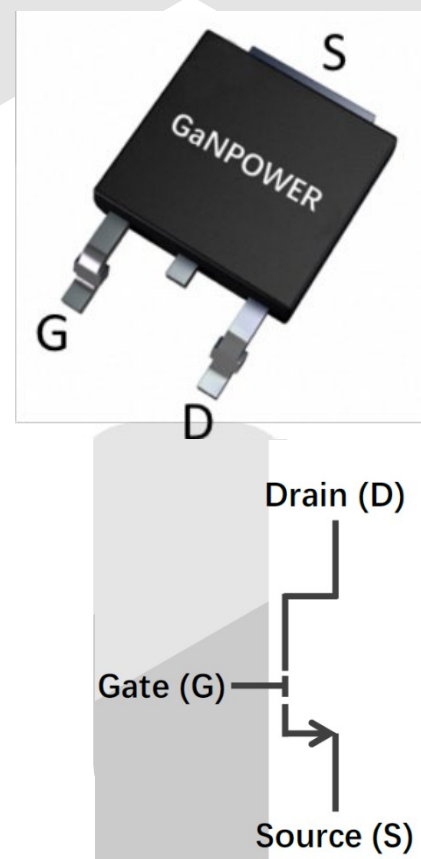
- Ultra-low  $R_{DS(on)}$
- High  $dv/dt$  capability
- Extremely low input capacitance
- Zero  $Q_{rr}$
- Outstanding switching performance
- Low Profile

### Applications

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

### Description

These devices are N-channel 1200V 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.



## Device Characteristics

Static Parameters				Test data			
	Parameters		Conditions	Min	Typical	Max	Unit
1	$V_{GS(TH)}$	Gate threshold voltage	$V_{DS}=V_{GS}$ $I_D=3.5mA$	0.9	1.7	2.9	V
2	$BV_{DSS}$	Drain-Source breakdown voltage	$V_{GS}=0V$ $I_D < 20 \mu A$ ( $T=25^\circ C$ )		1200		V
3	$I_{DSS}$	Zero gate voltage drain current, $T_C = 25^\circ C$	$V_{GS}=0V$ $V_{DS}=1200V$		0.1	18	$\mu A$
4	$I_{GSS}$	Gate-Source Leakage	$V_{GS} = 6V$ $V_{DS} = 0V$		13	500	$\mu A$
5	$R_{DSON}$	Static drain-source on resistance, $T_C = 25^\circ C$	$V_{GS}=6V$ $I_D=1A$		260	320	m $\Omega$
6	$V_{SD}$	Reverse conduction voltage	$I_{SD}=0.1A$ $V_{GS}=0V$	1.2	1.7	3.0	V
7	$R_g$	Gate resistance	$f=25MHz$ Open drain		2.6		$\Omega$
Dynamic Parameters				Test data			
	Parameters		Conditions	Min	Typical	Max	Unit
1	$C_{ISS}$	Input capacitance	$V_{GS}=0V$ $V_{DS}=700V$ $f=1MHz$		64		pf
	$C_{OSS}$	Output capacitance			19		pf
	$C_{RSS}$	Reverse transfer capacitance			3.5		pf
	$C_{O(er)}$	Effective output capacitance, energy related	$V_{DS} = 0 - 500V$		15		pf
2	$Q_g$	Gate charge	$V_{DS}=400V$ $I_D=9A$ $V_{GS}=6V$		1.9		nC
	$Q_{GS}$	Gate to source charge			0.3		nC
	$Q_{GD}$	Gate to drain charge			0.4		nC
3	$Q_{RR}$	Reverse recovery charge			0		nC
Switching Performance				Test data			
	Parameters		Conditions	Min	Typical	Max	Unit
1	$t_{d(on)}$	Turn-on delay time	$V_{DS}=800V$ $R_L=500\Omega, I_D=1.6A$ $R_g=22/2\Omega$ $V_{GS}=-1.5/6.5V$		6		ns
2	$t_r$	Rise time			24		ns
3	$t_{d(off)}$	Turn-off delay time			5		ns
4	$t_f$	Fall time			27		ns



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## Absolute Max. Ratings

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

## Thermal and Soldering Characteristics (Typical)

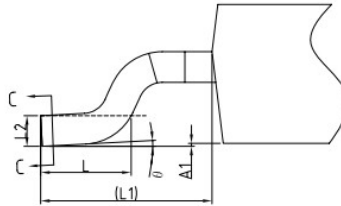
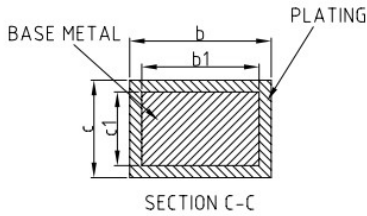
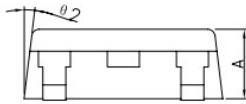
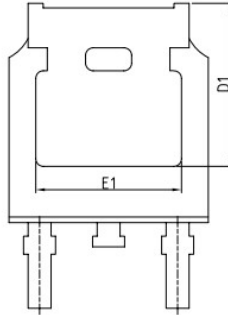
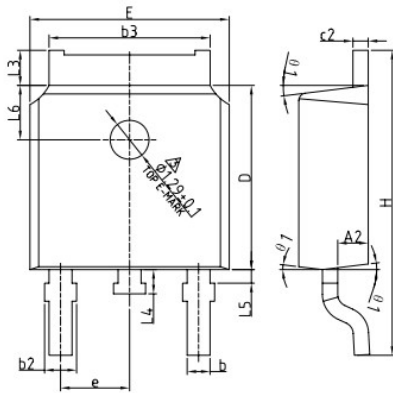
	Symbols	Parameters	Value	Unit
1	$R_{thJC}$	Thermal resistance (junction to case)	1.25	$^{\circ}C/W$
2	$R_{thJA}$	Thermal resistance (junction to ambient)	60	$^{\circ}C/W$
2	$T_{solder}$	Reflow soldering temperature	260	$^{\circ}C$

## Ordering

Order Code	Package Type	Packaging Method	Qty
GPIHV5DK	TO-252		

For more information, visit us at: [www.iganpower.com](http://www.iganpower.com), or contact us at [information@iganpower.com](mailto:information@iganpower.com)

## 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		
①	0°	-	8°
②	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

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**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.