

GPI65030DFN

N-channel 650V 30A GaN Power HEMT in 8X8 DFN package

Datasheet version: 2.9

Features

BV_{dss}	R_{dson}	I_{ds}	Q_g
650 V	55 m Ω	30 A	5.8 nC

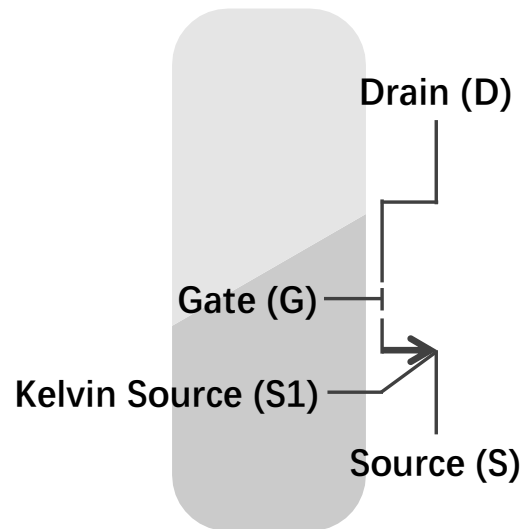
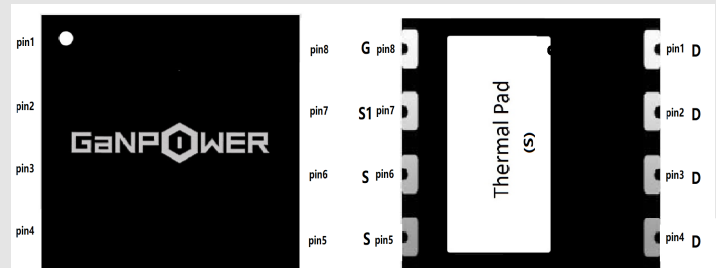
- Ultra-low $R_{DS(on)}$
- High dv/dt capability
- Extremely low input capacitance
- Zero Q_{rr}
- Outstanding switching performance
- Low Profile

Applications

- Switching Power Applications
- Adapters, Quick Chargers

Description

These devices are N-channel 650 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	$V_{ds}=V_{gs}$ $I_d=21mA$	0.9	1.2	2.9	V
2	BV_{dss}	Drain-Source breakdown voltage	$V_{gs}=0V$ $I_d<50\ \mu A$		650		V
3	I_{dss}	Zero gate voltage drain current, $T_c = 25\ ^\circ C$	$V_{gs}=0V$ $V_{ds}=650V$		0.13	50	μA
4	I_{gss}	Gate-Source Leakage	$V_{gs} = 6V$ $V_{ds} = 0V$		0.05	3	mA
5	R_{dson}	Static drain-source on resistance, $T_c = 25\ ^\circ C$	$V_{gs}=6V$ $I_d=6A$	29	55	70	m Ω
6	V_{sd}	Reverse conduction voltage	$I_{sd}=0.8A$ $V_{gs}=0V$	1.5	1.85	3.0	V
7	R_g	Gate resistance	$F=25MHz$		1.2		Ω
Dynamic Parameters				Test data			
	Parameters		Conditions	Min	Typical	Max	Unit
1	C_{iss}	Input capacitance	$V_{gs}=0V$		241		pf
	C_{oss}	Output capacitance	$V_{ds}=400V$		61		pf
	C_{rss}	Reverse transfer capacitance	$f=1MHz$		8.4		pf
3	Q_g	Gate charge	$V_{ds}=400V$		5.8		nC
	Q_{gs}	Gate to source charge	$I_d=7.5A$		1.2		nC
	Q_{gd}	Gate to drain charge	$V_{gs}=6V$		1.5		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	$V_{ds}=400V$		6		ns
2	t_r	Rise time	$I_d=2.5A$		12		ns
3	$t_{d(off)}$	Turn-off delay time	$R_g=10\Omega$		15		ns
4	t_f	Fall time	$V_{gs}=6V$		13		ns



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Absolute Max. Ratings

	Symbols	Parameters	Value	Unit
1	V_{DS-max}	Breakdown voltage transient @ $T_{case}=25^{\circ}C$	800	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 @ $T_{case}=25^{\circ}C$	30	A
4	I_{ds-max}	Drain to source DC current @ $T_{case}=100^{\circ}C$	24	A
5	dv/dt_{max}	Drain to source voltage slew rate	200	V/nS
6	T_{J-max}	Max junction temperature	150	$^{\circ}C$
7	$T_{S-storage}$	Storage temperature	-55 to 150	$^{\circ}C$

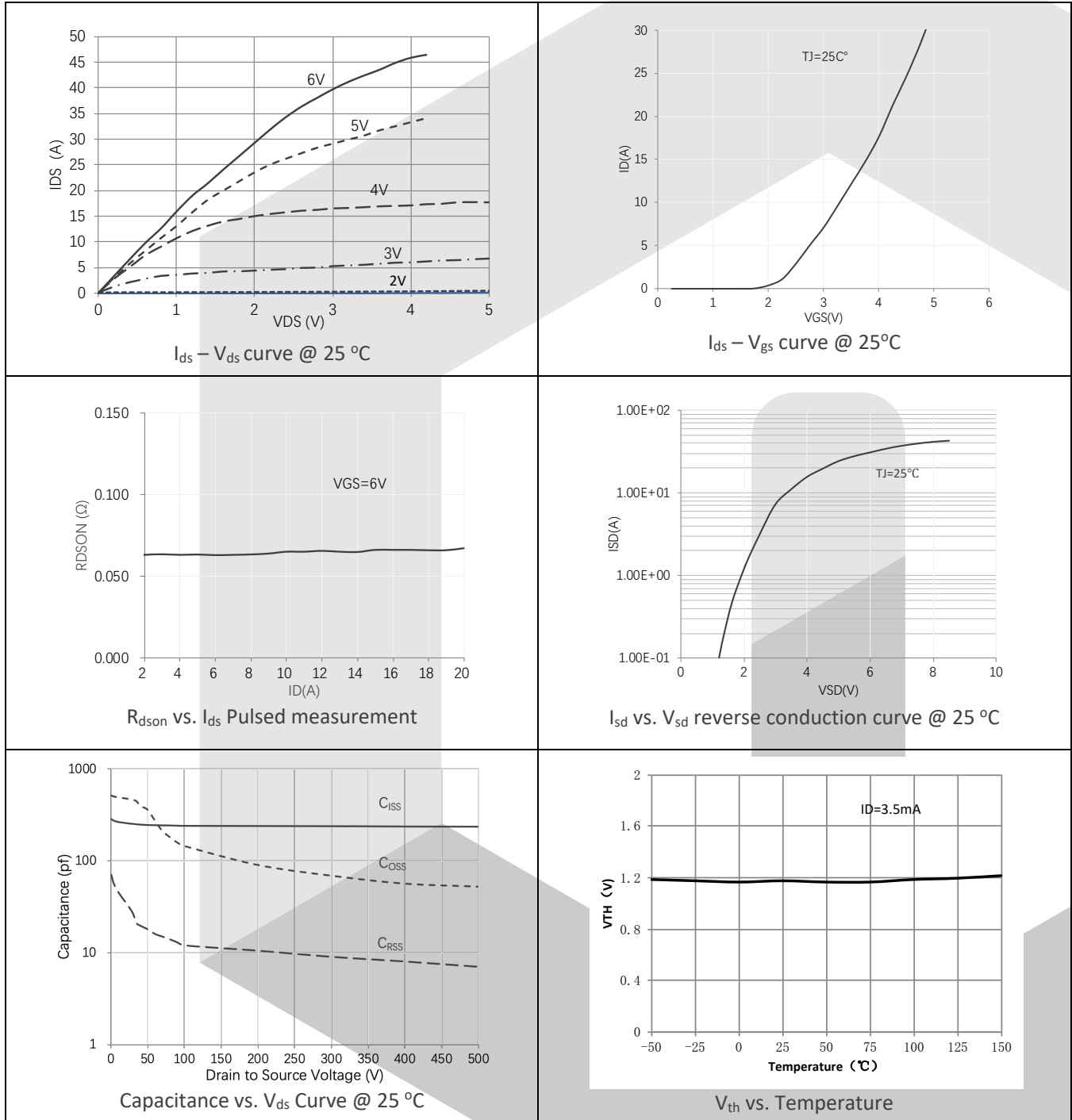
Thermal and Soldering Characteristics (Typical)

	Symbols	Parameters	Value	Unit
1	R_{thJC}	Thermal resistance (junction to case)	0.95	$^{\circ}C /W$
2	T_{solder}	Reflow soldering temperature	250	$^{\circ}C$

Ordering

Order Code	Package Type	Packaging Method	Qty
GPI65030DFO	DFN surface mount, bottom cooled, 8X8 mm	Tape and Reel	3500

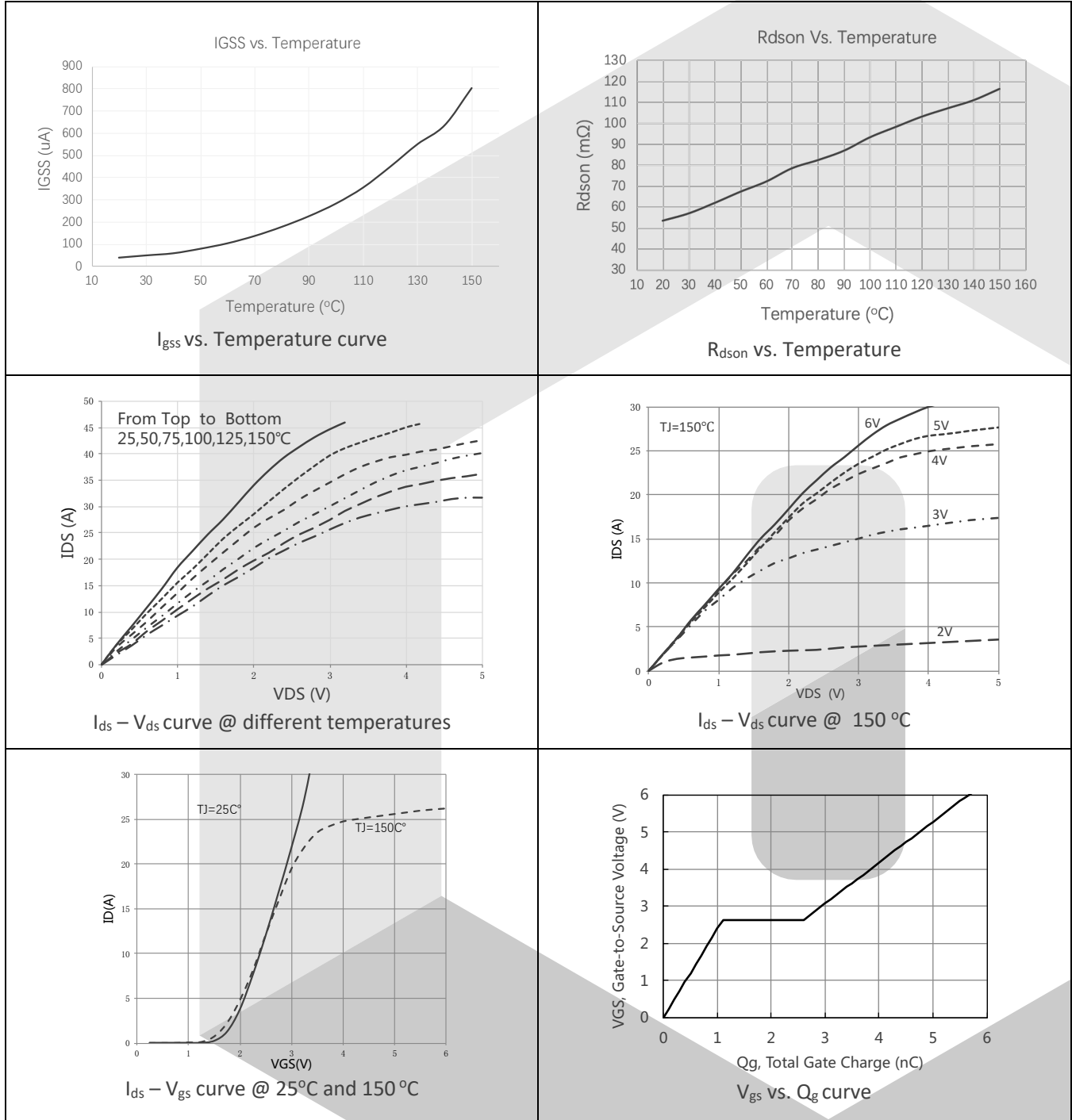
Electrical Performance





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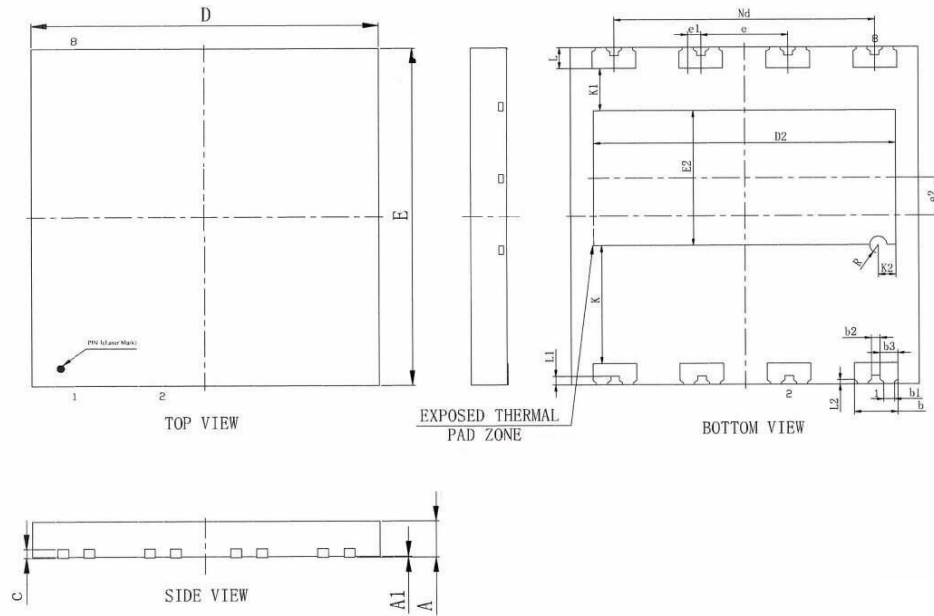




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Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.80	0.85	0.90
A1	0	0.02	0.05
b	0.95	1.00	1.05
b1	0.25REF		
b2	0.20REF		
b3	0.35	0.40	0.45
c	0.203REF		
D	7.90	8.00	8.10
D2	6.84	6.94	7.04
Nd	6.00RSC		
e	2.00HSC		
e1	0.30HSC		
e2	0.90HSC		
E	7.90	8.00	8.10
E2	3.10	3.20	3.30
L	0.45	0.50	0.55
L1	0.20REF		
L2	0.10REF		
K	2.80REF		
K1	1.00REF		
K2	0.40REF		
R	0.15	0.20	0.25



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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.