

GP120R45T4

N-channel 1200V 30A GaN Power HEMT in TO247-4 Package

Preliminary Datasheet version: 1.0

Features

V_{DSS}	$R_{DS(on)}$	I_{DS}	V_{GS}	$V_{GS(TH)}$
1200V	45mΩ	30A	-1V to +12V	2.5V

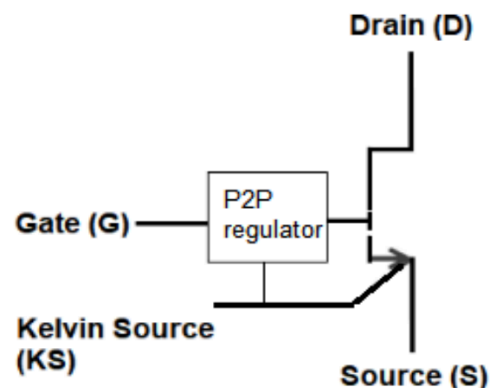
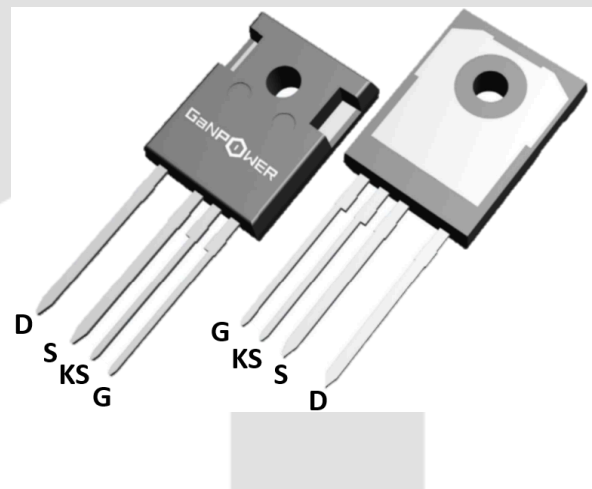
- Ultra-low $R_{DS(on)}$
- High dv/dt capability
- Extremely low input capacitance
- Zero Qrr
- Outstanding switching performance
- Low Profile
- **Upgraded P2P GaN with input regulator IC to match input lead and voltage of existing SiC MOSFET**

Applications

- Switching Power Applications
- Server and Telecom Power Application
- EV OBC 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, integrating an input regulator circuit to match input lead and voltage of existing SiC MOSFET in a pin-to-pin (P2P) fashion. 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

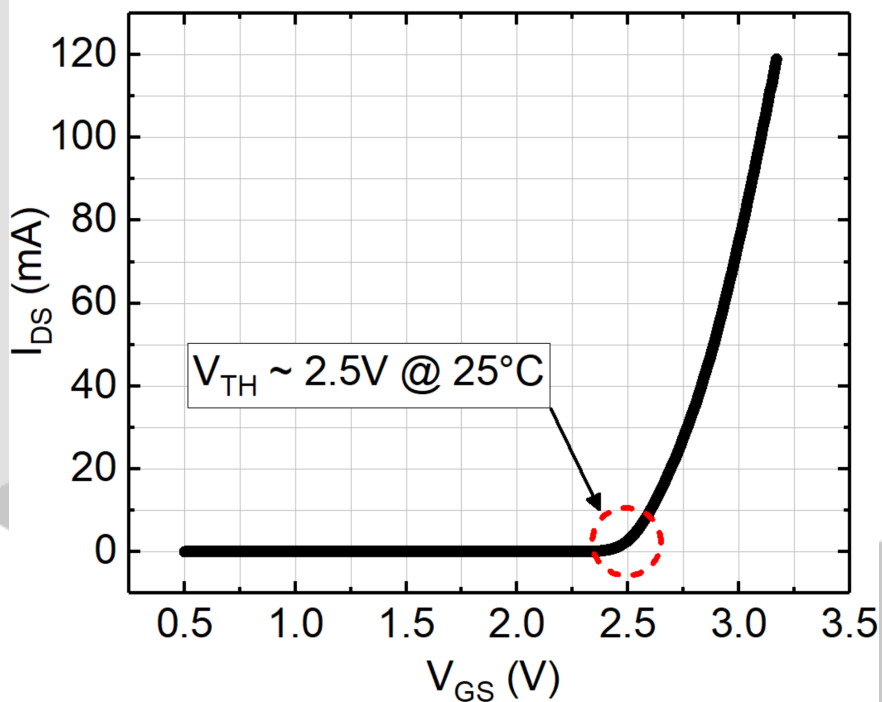
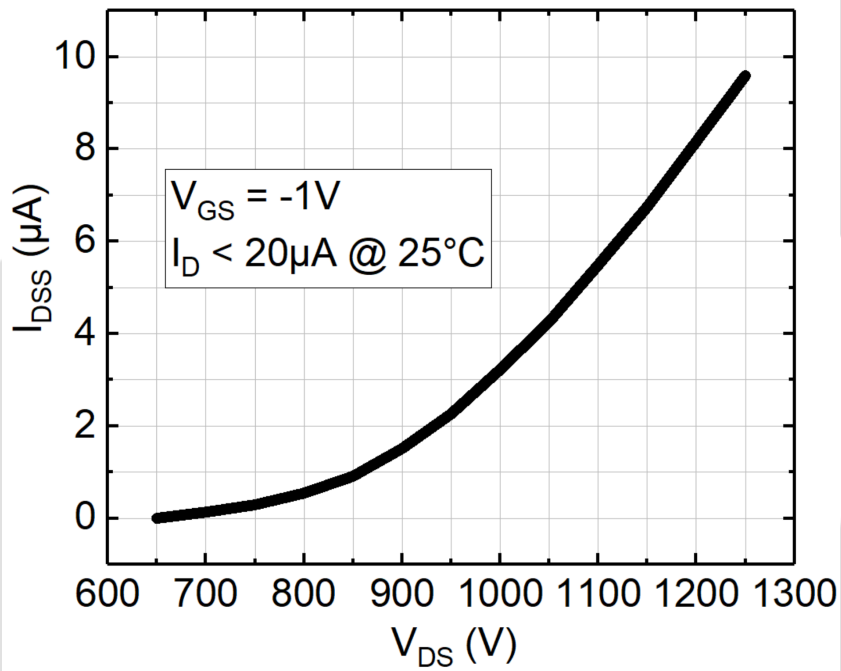
Basic Parameters				Test data			
	Parameters		Conditions	Min	Typical	Max	Unit
1	$V_{GS(TH)}$	Zero gate voltage drain current, $T_c = 25^\circ\text{C}$	$V_{DS} = V_{GS}$ $I_D = 3\text{mA}$		2.4	2.5	V
2	BV_{DSS}	Drain-Source breakdown voltage	$V_{GS} = 0\text{V}$ $I_D < 20\mu\text{A}$		1200		V
3	I_{DSS}	Zero gate voltage drain current, $T_c = 25^\circ\text{C}$	$V_{GS} = 0\text{V}$ $V_{DS} = 1200\text{V}$		7.5	9.0	μA
4	I_{GSS}	Gate-Source Leakage @ 25°C	$V_{GS} = 12\text{V}$ $V_{DS} = 0\text{V}$		130	160	mA
5	$R_{DS(ON)}$	Static drain-source on resistance, $T_c = 25^\circ\text{C}$	$V_{GS} = 12\text{V}$		45	65	m Ω
Switching Performance				Test data			
	Parameters		Conditions	Min	Typical	Max	Unit
1	$t_{D(ON)}$	Turn-on delay time	$V_{DS} = 800\text{V}$ $I_D = 24\text{A}$ $V_{GS} = +12\text{V}/-1\text{V}$ $R_{GON} = 2\Omega$ $R_{GOFF} = 0\Omega$		16.7		ns
2	t_R	Rise time			33.5		ns
3	$t_{D(OFF)}$	Turn-off delay time			22.7		ns
4	t_F	Fall time			22.4		ns
5	E_{ON}	Switching energy during turn-on			725.1		μJ
6	E_{OFF}	Switching energy during turn-off			160.0		μJ

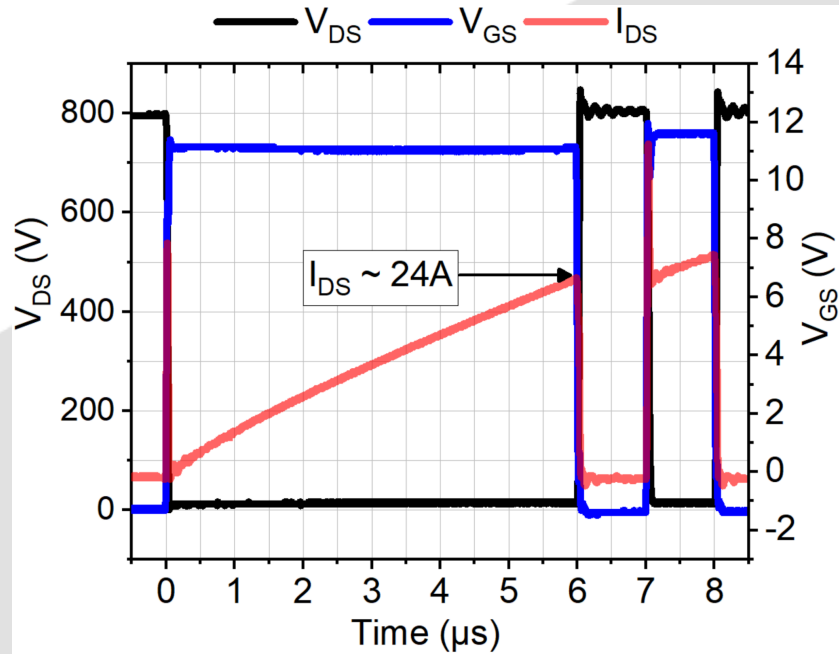


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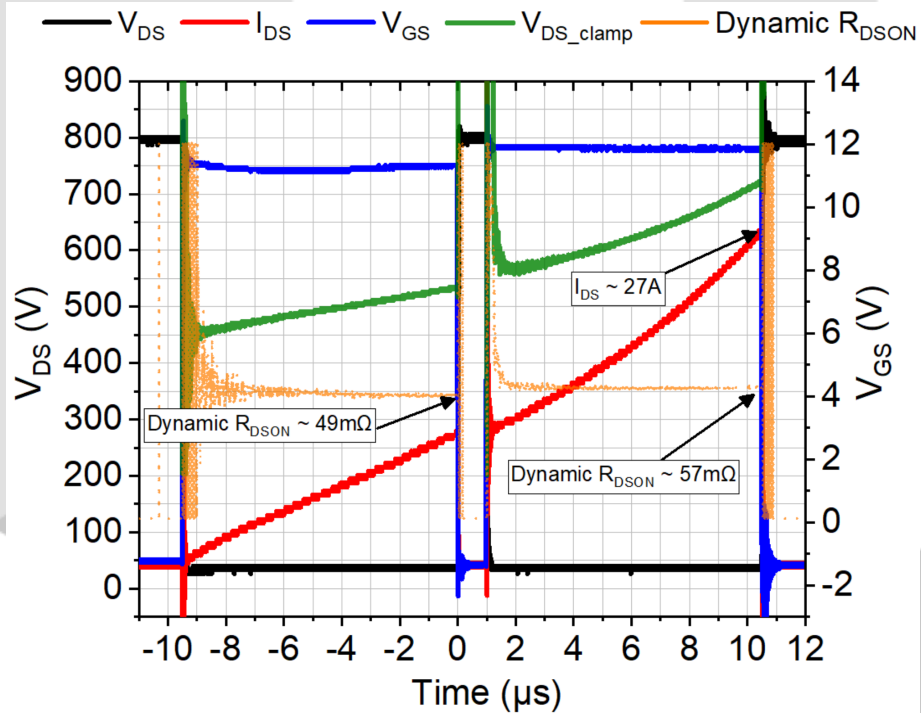
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Electrical Performance





DPT @ 25°C: $V_{BUS} = 800V$, L-load = 121 μH



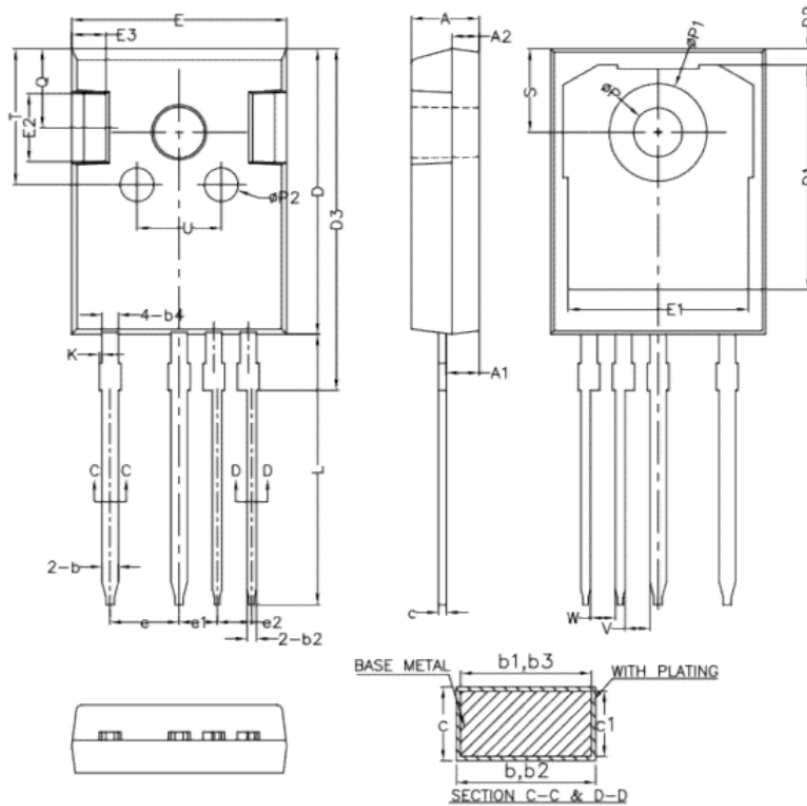
DPT @ 25°C: $V_{BUS} = 800V$, L-load = 360 μH



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Package Information



COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
SYMBOL	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
b	1.16	-	1.29
b1	1.15	1.20	1.25
b2	0.66	-	0.79
b3	0.65	0.70	0.75
b4	1.16	-	1.29
c	0.59	-	0.66
c1	0.58	0.60	0.62
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.20	1.35
D3	24.97	25.12	25.27
E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
e	4.98	5.08	5.18
e1	2.69	2.79	2.89
e2	2.44	2.54	2.64
K	0	-	0.20
L	19.80	19.92	20.10
P	3.50	3.60	3.70
P1	-	-	7.40
P2	2.40	2.50	2.60
Q	5.60	-	6.00
S	6.00	6.15	6.30
T	9.80	-	10.20
U	6.00	-	6.40
V	1.44	1.84	2.24
W	1.44	1.84	2.24

NOTES:
 1.ALL DIMENSIONS DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.
 2.EJECTION MARK DEPTH 0.10^{+0.15}/_{-0.05}.



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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.