

## GP120R45T4

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

Preliminary Datasheet version: 1.0

### Features

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

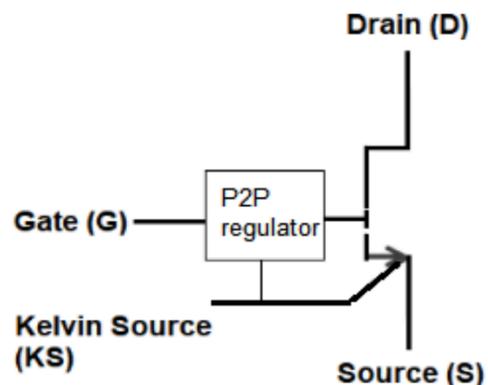
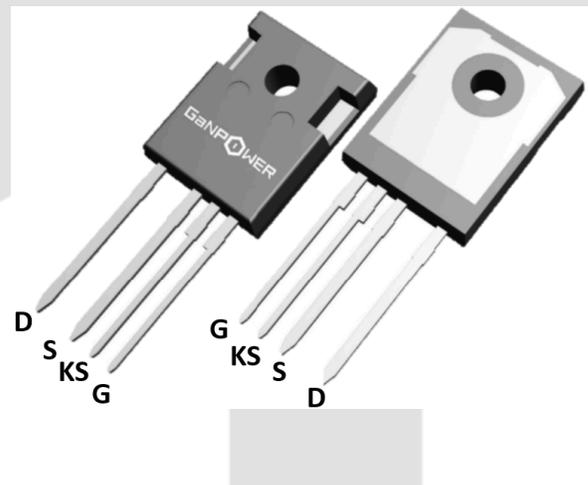
- Ultra-low  $R_{DSON}$
- High dv/dt capability
- Extremely low input capacitance
- Zero Qrr
- Outstanding switching performance
- Low Profile
- **Upgraded P2P GaN with input regulator IC to match input lead and voltage of existing SiC MOSFET**

### 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.





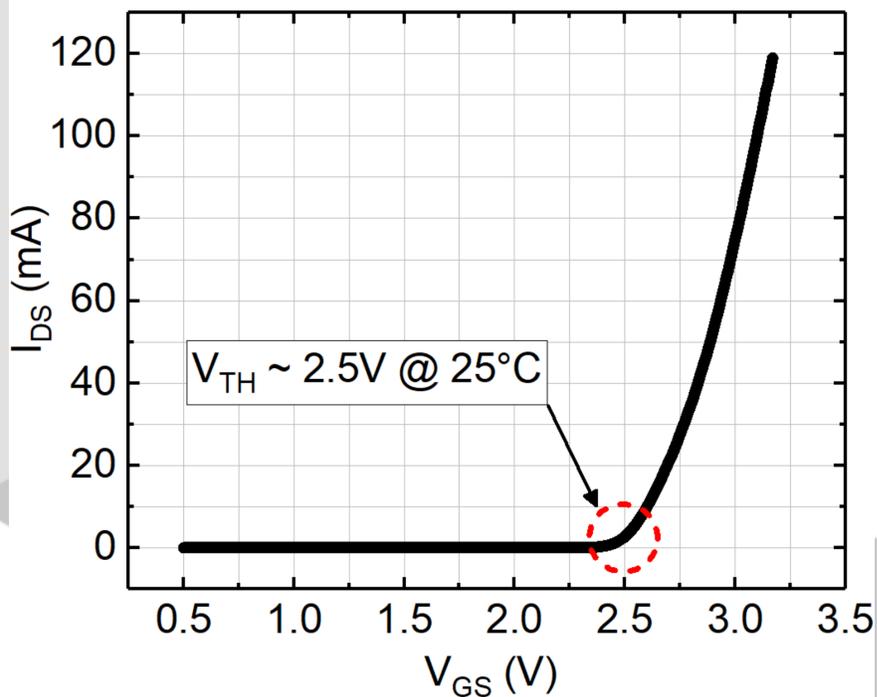
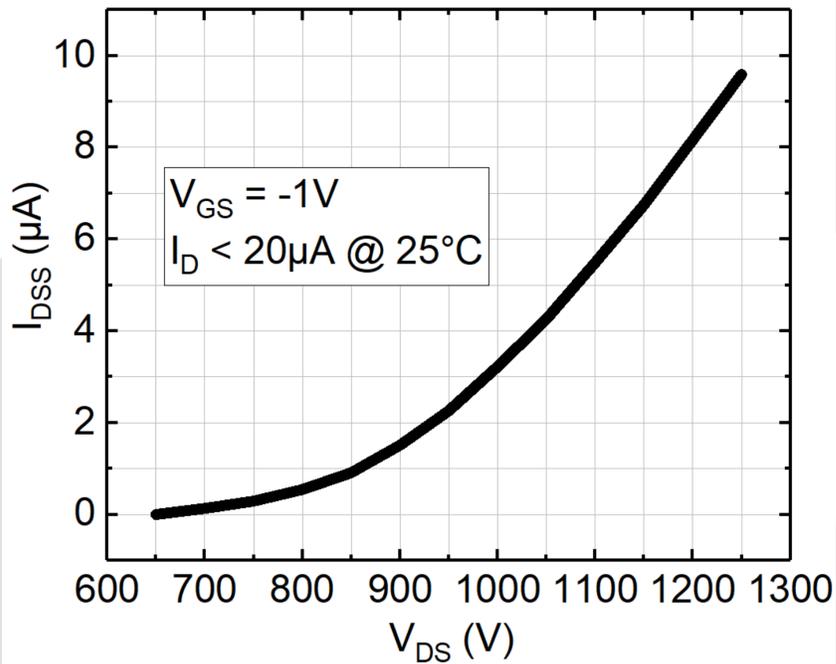
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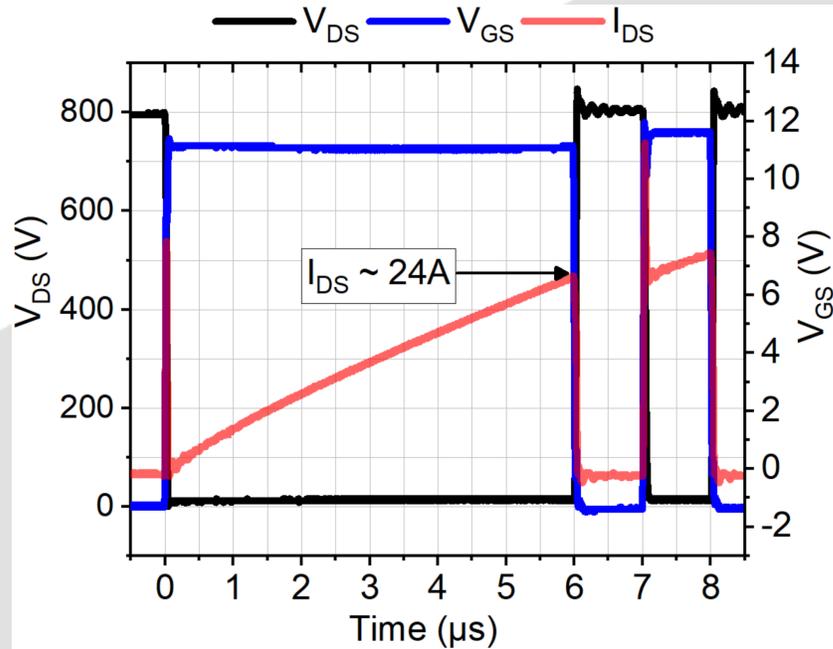
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## Device Characteristics

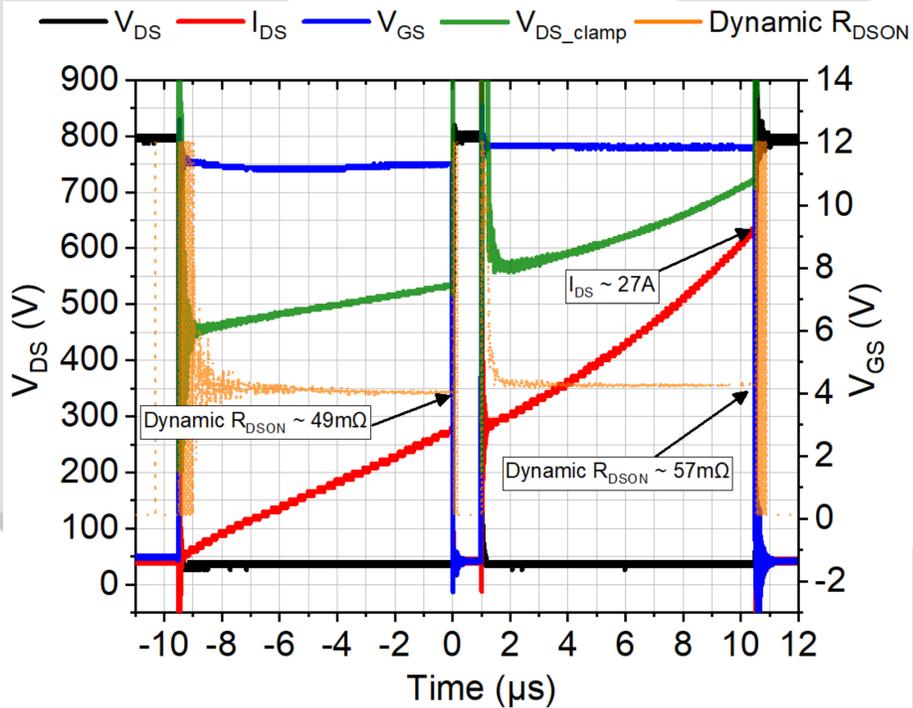
Basic Parameters				Test data			
	Parameters		Conditions	Min	Typical	Max	Unit
1	$V_{GS(TH)}$	Zero gate voltage drain current, $T_c = 25^\circ\text{C}$	$V_{DS} = V_{GS}$ $I_D = 3\text{mA}$		2.4	2.5	V
2	$BV_{DSS}$	Drain-Source breakdown voltage	$V_{GS} = 0\text{V}$ $I_D < 20\mu\text{A}$		1200		V
3	$I_{DSS}$	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	$\mu\text{A}$
4	$I_{GSS}$	Gate-Source Leakage @ $25^\circ\text{C}$	$V_{GS} = 12\text{V}$ $V_{DS} = 0\text{V}$		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 $\Omega$
Switching Performance				Test data			
	Parameters		Conditions	Min	Typical	Max	Unit
1	$t_{D(ON)}$	Turn-on delay time	$V_{DS} = 800\text{V}$ $I_D = 24\text{A}$ $V_{GS} = +12\text{V}/-1\text{V}$ $R_{GON} = 2\Omega$ $R_{GOFF} = 0\Omega$		14.7		ns
2	$t_R$	Rise time			44.9		ns
3	$t_{D(OFF)}$	Turn-off delay time			22.0		ns
4	$t_F$	Fall time			23.6		ns
5	$E_{ON}$	Switching energy during turn-on			728.2		$\mu\text{J}$
6	$E_{OFF}$	Switching energy during turn-off			175.9		$\mu\text{J}$

## Electrical Performance





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



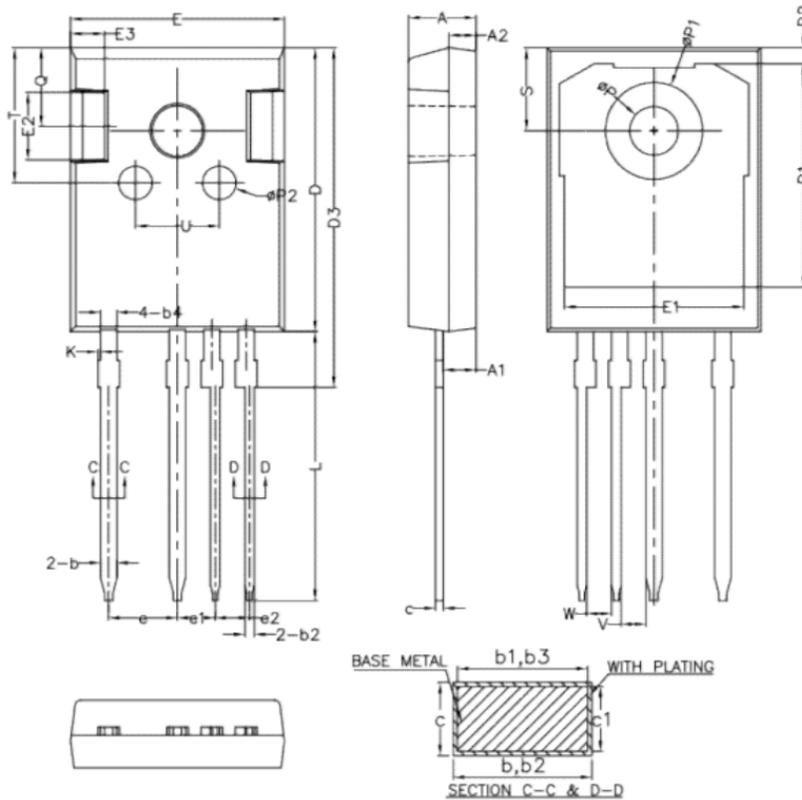
DPT @ 25°C:  $V_{BUS} = 800V$ , L-load = 360 $\mu H$



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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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**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.