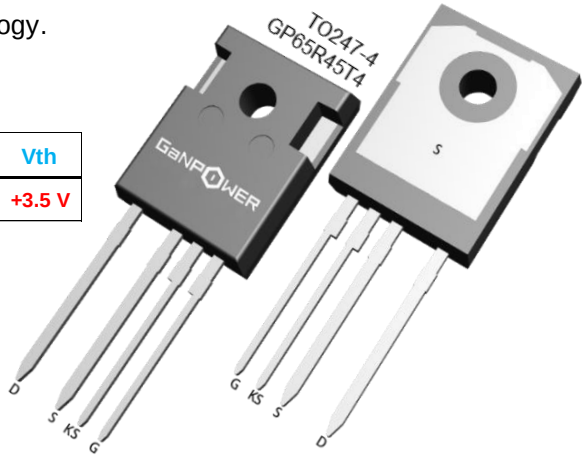
Description

The GP65R45xx is a 650V E-mode GaN transistor based on silicon technology.

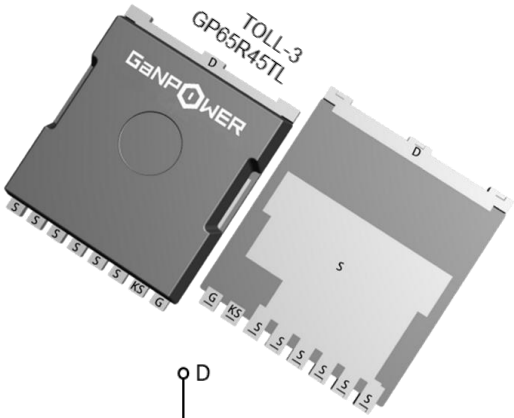


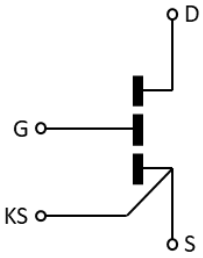
Features

BVdss		Rdson@25℃		Ids@25℃		Qg	Vgs	Vth
Transient	900 V	Typ	45 mΩ	Max	30 A	6.9 nC	±20 V	+3.5 V
Continuous	650 V	Max	60 mΩ	Pulse	62 A			

Absolute Max. Ratings

	Symbols	Parameters	Value	Unit
1	V_{ds} -max	Breakdown voltage transient @ T_{case}=25°C~125°C	900	V
		Breakdown voltage continuous @ T_{case}=25°C~125°C	650	V
2	V_{gs} -max	Gate to source max. voltage @ T_{case}=25°C	-20 ~ +30	V
3	I_{ds}-max	Drain to source max current @ T_{case}=25°C, V_{GS} = +12 V, f=500KHz,Vbus=650V	30	A
		Drain to source max current @ T_{case}=125°C, V_{GS} = +12 V, f=500KHz,Vbus=650V	28	A
		Drain to source pulse current @ T_{case} =25°C , pulse width 10 μs, V_{GS} = +12 V，Vbus = 650V	62	A
4	dv/dt-max	Drain to source voltage slew rate	200	V/ns
5	T_J -max	Max junction temperature	150	°C
6	T_S -storage	Storage temperature	-55 ~ 150	°C
7	T_J -operate	Operating temperature	-55 ~ 150	°C





Thermal and Soldering Characteristics

	Symbols	Parameters	Value	Unit	Package
1	R_{thJC}	Thermal resistance (junction to case)	0.6	°C/W	TO247-4
			0.27		TOLL-3
2	R_{thJA}	Thermal resistance (junction to ambient)	62	°C/W	TO247-4
			40		TOLL-3
3	T_{solder}	Reflow soldering temperature	260	°C	All

Ordering Information

Order Code	Package Type	Packaging	Qty
GP65R45T4	TO247-4	Tube	30
GP65R45TL	TOLL-3 PG-HSOF-8-3	Tape-and-Reel	2000

Device Characteristics

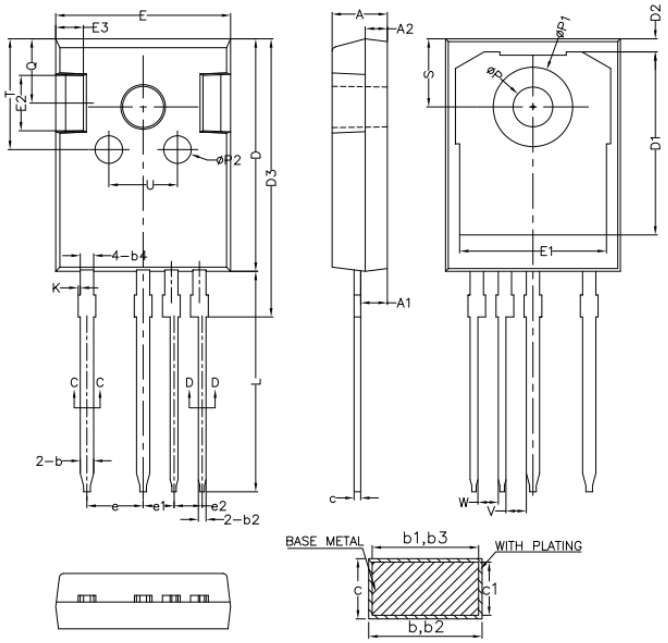
Static Parameters				Test data			
	Parameters		**Conditions**	**Min**	**Typical**	**Max**	**Unit**
1	$V_{gs(TH)}$	Gate threshold voltage	$V_{ds}=V_{gs}$, I_d=21 mA (T_J=25 °C)	3.0	3.5	4.0	V
2	V_{gs}[1]	Gate-Source voltage range		-20	12	20	V
3	BV_{dss}[2]	Drain-Source breakdown voltage	V_{gs}=0V, I_d < 1 mA (T_J=25 °C)		650		V
4	I_{dss}	Zero gate voltage drain leakage current	V_{gs}=0V, V_{ds}= 700V T_J = 25 °C		1.3	2.0	μA
5	I_{gss}	Gate-Source Leakage	V_{gs} = 6V, V_{ds} = 0V		0.7	30	mA
6	R_{dson}	drain-source on resistance	V_{gs}=6V, I_d=0.8A T_J = 25 °C		45	60	mΩ
7	V_{sd}	Reverse conduction voltage	I_{sd}=0.12A, V_{gs}=0V	1.2	2.0	3	V
8	R_g	Gate resistance	f=25Mhz Open drain		1.5		Ω
Dynamic Parameters				**Test data**			
	Parameters		**Conditions**	**Min**	**Typical**	**Max**	**Unit**
1	C_{iss}	Input capacitance	V_{gs} = 0 V V_{ds} = 700 V f = 1MHz		10		pf
2	C_{oss}	Output capacitance			72		pf
3	C_{rss}	Reverse transfer capacitance			4.6		pf
4	Q_g	Gate charge	Vds = 400V Id = 9A Vgs = 6V		6.9		nC
5	Q_{gs}	Gate to source charge			1.5		nC
6	Q_{gd}	Gate to drain charge			1.8		nC
7	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 Id = 15A Rg = 10Ω Vgs = -3/6.5V		34		ns
2	t_r	Rise time			26		ns
3	$t_{d(off)}$	Turn-off delay time			33		ns
4	t_f	Fall time			20		ns

[1] A wider range of gate driving from-20V to 20V can be accepted, but recommended range is still 0V to +12V. Wider range protects the gate from damage, but at some cost of power loss.

[2] BV_{dss} refers to DC withstanding voltage. This product is recommended for DC bus voltage of 400V-650V.

Package Information

TO247-4



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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