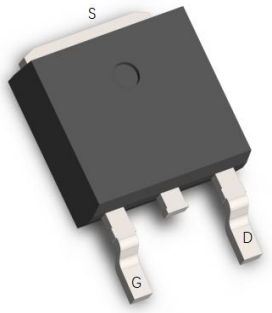
E-mode 650V,7A,400mΩ GaN HEMT

Description

TK65B400 is an enhancement mode GaN-on-silicon transistor. GaN is a wide band gap semiconductor with high power density. The gallium nitride transistor is characterized by no body diode, so the reverse recovery charge is zero.

Features

- 650 V enhancement mode power switch
- $R_{DS(on)}$ =400mΩ
- $I_{DS(max)}$ = 7A
- Easy gate drive requirements (0 V to 6 V)
- Very high switching frequency (> 10 MHz)
- Fast and controllable fall and rise times
- Zero reverse recovery loss

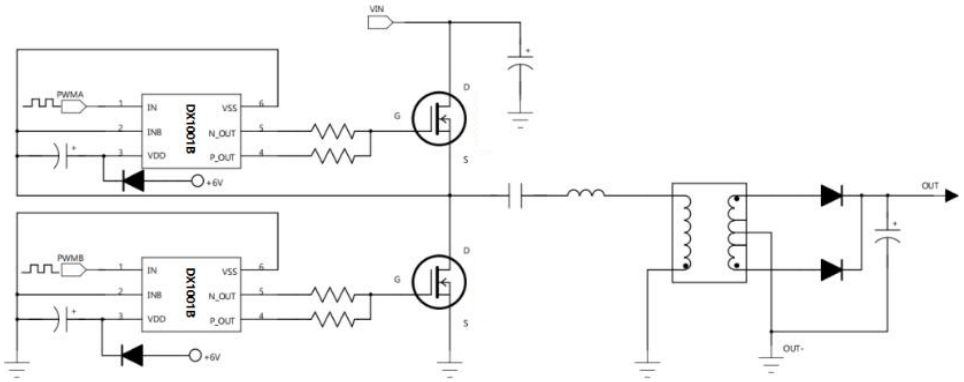


Applications

- Fast Battery Charging
- LED lighting drivers
- Power Factor Correction
- LLC Converters
- Wireless Power Transfer

Device Information

Part Number	Package	Packing
TK65B400	TO252	Tape 2500/reel



Typical application circuit of LLC

Absolute Maximum Ratings(Tc=25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit	Condition
Drain-Source voltage	V_{DS}	650	V	
Gate-source voltage	V_{GS}	-10 to 6	V	
Continuous drain current*	I_D	7	A	Tc=25℃
		4	A	Tc=125℃
Operation and storage temperature	T_j	-55 to 150	℃	
	T_{stg}	-55 to 150	℃	

Electrical Characteristics (Tc=25℃ unless otherwise specified)

Typical Performance – Static

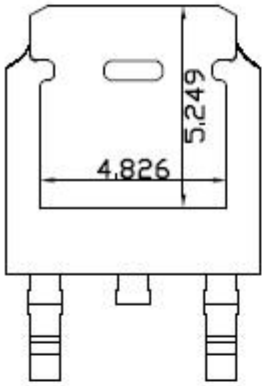
Parameter	Symbol	Values			Unit	Test condition
		Min.	Type.	Max.		
Drain source breakdown voltage	BV_{DS}	650	/	/	V	VGS=0V, ID=20μA
Total drain leakage current	I_{DSS}	/	0.3	10	μA	VDS=650V, VGS=0V, Tj=25℃
		/	5	75	μA	VDS=650V, VGS=0V, Tj=150℃
Gate-to-source current	I_{GSS}	/	2	/	μA	VDS=0V, VGS=6V, Tj=25℃
Static drain-source on-resistance	$R_{DS(ON)}$	/	350	400	mΩ	VGS=6V, ID=3A, Tj=25℃
		/	650	/	mΩ	VGS=6V, ID=3A, Tj=150℃
Gate threshold voltage	$V_{GS(th)}$	1.2	1.6	2.0	V	VDS=VGS, ID=3.5mA ,

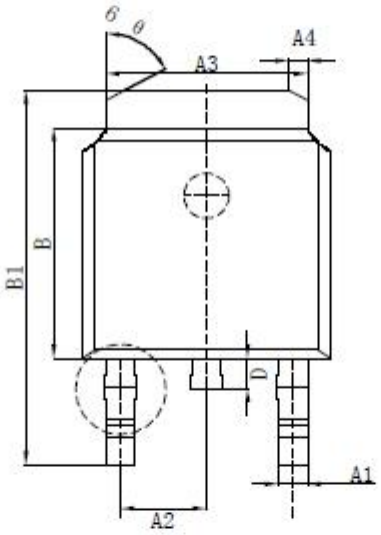
Typical Performance – Dynamic

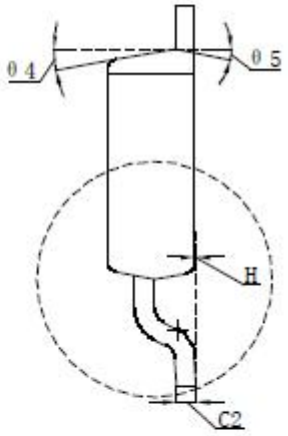
Parameter	Symbol	Values			Unit	Test condition
		Min	Type	Max		
Input capacitance	C_{ISS}	/	32	/	pF	V_{DS}=400V, V_{GS}=0V, f=1MHz
Output capacitance	C_{OSS}	/	9	/	pF	
Reverse transfer capacitance	C_{RSS}	/	0.3	/	pF	
Output capacitance, energy related	$C_{OSS(er)}$	/	15	/	pF	V_{DS}=0V to 400V,V_{GS}=0V
Output capacitance time related	$C_{OSS(tr)}$	/	21	/	pF	
Total gate charge	Q_G	/	1.3	/	nC	V_{DS}=400V, V_{GS}=0V to 6V
Gate-drain charge	Q_{GD}	/	0.6	/	nC	
Gate-source charge	Q_{GS}	/	0.33	/	nC	
Gate Resistance	R_G	/	2.88	/	Ω	*f* = *f*res, Open drain

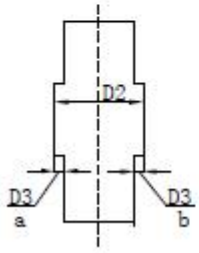
Package

尺寸 / 标注	最小(mm)	最大(mm)	尺寸 / 标注	最小(mm)	最大(mm)
A	6.50	6.70	D1	1.40	1.60
A1	0.71	0.81	D2	0.81	0.91
A2	2.236	2.336	D3	0.05TYP	
A3	5.284	5.384	H	0.00	0.10
A4	0.75	0.85	R	0.40TYP	
B	6.00	6.20	θ1	0° ~ 8°	
B1	9.80	10.10	θ2	8.5° TYP4	
C	2.20	2.40	θ3	25° TYP	
C1	0.967	1.087	θ4	10° TYP2	
C2	0.498	0.518	θ5	10° TYP	
D	0.70	0.90	θ6	70° TYP	









0<a、b<0.1

