

YHJ-65P150TK: (TO-220) Cascode GaN HEMT

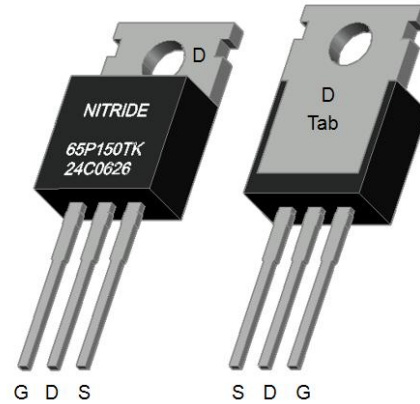
Description

YHJ-65P150TK is a normally-off GaN High electron mobility transistor (HEMT) device using the cascode configuration, which provides high breakdown voltage, high current and high operating speed which is suitable for high power applications.

Key Specifications

Part Number	YHJ-65P150TK
V_{DS} , min.	650V
$R_{DS(ON)}$, typ.	150m Ω
Q_G , typ.	12nC
Package	TO-220

YHJ-65P150TK (TO-220)

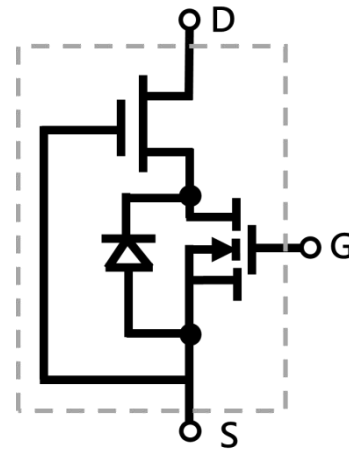


Features

- Gate drive voltage compatibility (-20V to +20V)
- Pin assignment P2P compatible with silicom (SJ) and SiC MOSFET
- High operating frequency
- Low Q_{rr}

Applications

- Switch Mode Power Supplies (SMPS)
- AC-DC/ DC-DC Converters
- Motor Drives



Cascode Device Structure

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1- Electrical Characteristics

➤ Table 1 Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain-source voltage		650	V
$V_{(TR) DSS}$	Transient drain to source voltage ^a		800	V
V_{GSS}	Gate- source voltage		-20V ~ +20V	V
I_D	Drain current (continuous) at $T_C = 25^\circ\text{C}$ operation		12	A
	Drain current (continuous) at $T_C = 100^\circ\text{C}$ operation		8	A
I_{DM}	Pulsed drain current (pulse width: 10 μ s)		21	A
T_C	Operating temperature	Case	-55 to +150	$^\circ\text{C}$
T_J		Junction	-55 to +150	$^\circ\text{C}$
T_S	Storage temperature		-55 to +150	$^\circ\text{C}$
T_{SOLD}	Soldering peak temperature ^b		260	$^\circ\text{C}$

a. In off-state, spike duty cycle $D < 0.01$, spike duration $< 1\mu\text{s}$

b. For 10 sec., 1.6mm from the case

➤ Table 2 Thermal Characteristics

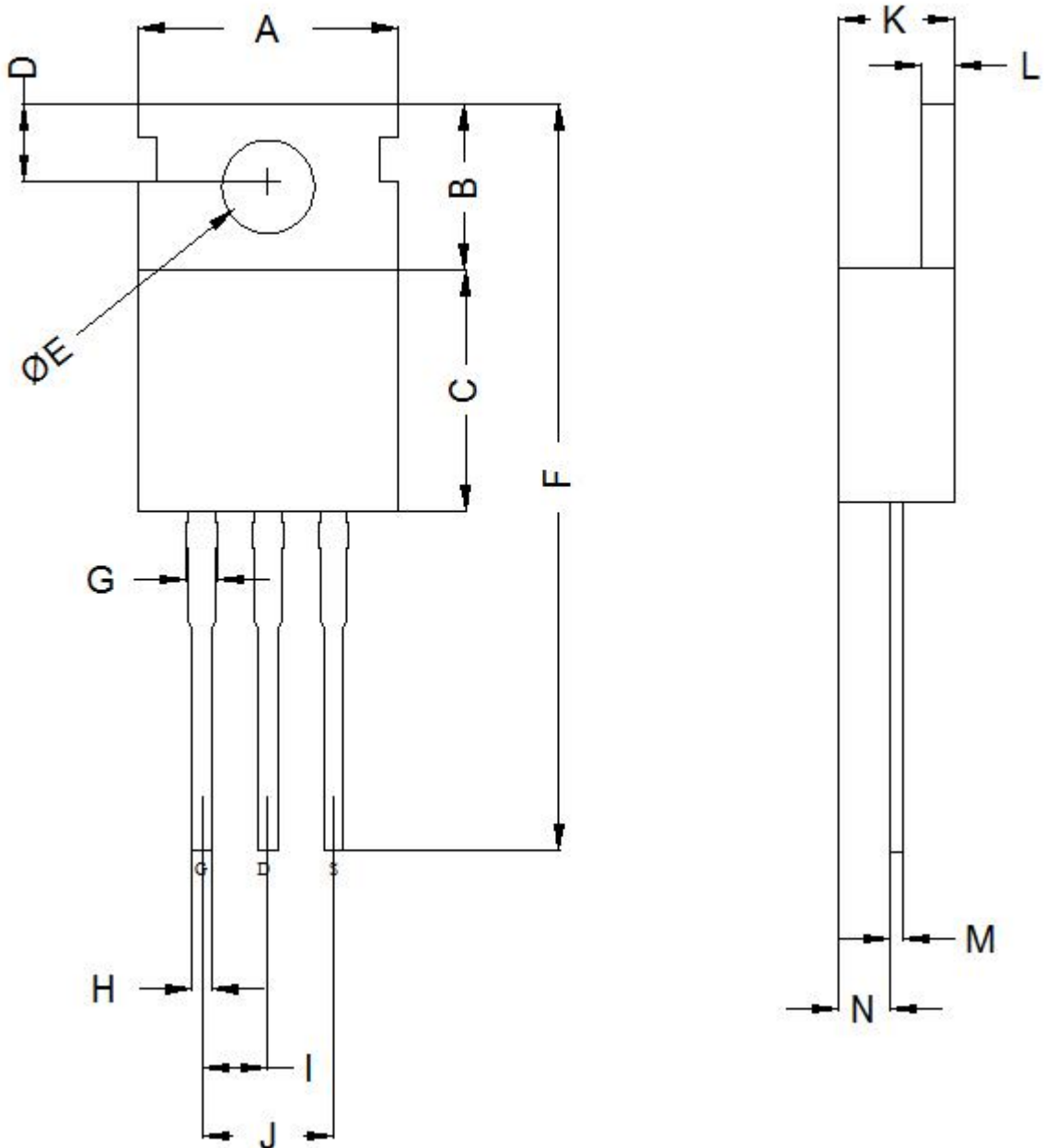
Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal resistance junction-ambient	5.4	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal resistance junction-case	1.05	$^\circ\text{C/W}$

➤ **Table 3** Electrical Characteristics ($T_{CASE} = 25^\circ\text{C}$ unless otherwise stated)

Symbol	Parameter	Conditions	Values			Unit
			min.	typ.	max.	
$V_{(BL)DSS}$	Drain-source voltage	$V_{GS}=0V$	650	-	-	V
$V_{GS(th)}$	Gate threshold voltage	$V_{DS}=10V, I_D=1mA$		1.7	2.2	V
$R_{DS(on)}$	Static drain-source on-resistance	$V_{GS}=6V, I_D=5A, T_J=25^\circ\text{C}$	-	150	185	$m\Omega$
		$V_{GS}=6V, I_D=5A, T_J=150^\circ\text{C}$	-	302	-	
I_{DSS}	Drain-source leakage current	$V_{GS}=0V, V_{DS}=650V, T_J=25^\circ\text{C}$	-	2.5	28	μA
		$V_{GS}=0V, V_{DS}=650V, T_J=150^\circ\text{C}$	-	10	-	
I_{GSS}	Gate-to-source forward leakage current	$V_{GS}=20V$	-	-	100	nA
	Gate-to-source reverse leakage current	$V_{GS}=-20V$	-	-	-100	
C_{ISS}	Input capacitance	$V_{GS}=0V, V_{DS}=400V, f=1MHz$		505	-	pF
C_{OSS}	Output capacitance		-	29	-	
C_{RSS}	Reverse transfer capacitance		-	1	-	
Q_G	Gate charge	$V_{GS}=0\sim 10V, V_{DS}=400V, I_{DS}=5A$	-	10	-	nC
Q_{GS}	Gate-source charge		-	4.3	-	
Q_{OSS}	Output charge	$V_{GS}=0V, V_{DS}=0\sim 400V$	-	36	-	nC
$t_{D(on)}$	Turn-on delay time	$V_{DS}=400V, V_{GS}=0\text{ to }10V, I_{DS}=2A, R_G=25\Omega$	-	9	-	ns
$t_{D(off)}$	Turn-off delay time		-	20	-	
Q_{RR}	Reverse recovery charge	$I_S=5A, V_{DS}=400V$	-	46	-	nC

2- Package Outline Dimensions

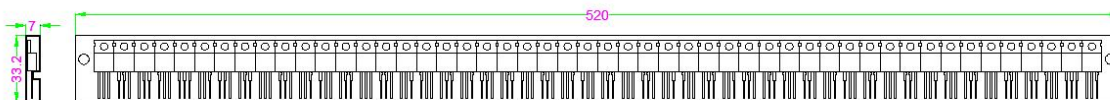
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➤ Table 4 Dimension of YHJ-65P150TK

Ref.	Dimensions(in mm)			Ref.	Dimensions(in mm)		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.9	10	10.1	H	0.65	0.75	0.85
B	6.3	6.4	6.5	I	2.44	2.54	2.64
C	9.2	9.3	9.4	J	4.98	5.08	5.18
D	2.9	3	3.1	K	4.4	4.5	4.6
E	3.5	3.6	3.7	L	1.2	1.3	1.4
F	28.7	28.8	28.9	M	0.4	0.5	0.6
G	1.2	1.3	1.4	N	1.9	2	2.1

4- Tube Package Information



50pcs/tube
1000pcs/box
5000pcs/carton

5- Change Log

Version	Date	Description
0.1	July 28, 2024	Initial version
0.2		

● **Note:** YHJ semiconductor reserves the right to revise products and/or specifications without notice