

# FNK10N25V

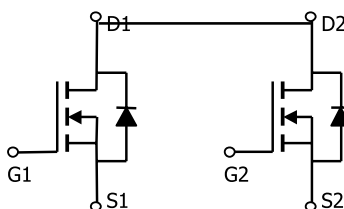
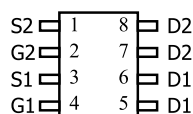
## Dual N-Channel Enhancement Mode Field Effect Transistor

### General Description

The FNK10N25V uses advanced trench technology to provide excellent  $R_{DS(on)}$  and low gate charge. They offer operation over a wide gate drive range from 1.8V to 8V. The two devices may be used individually, in parallel or to form a bidirectional blocking switch.

### Features

- $V_{DS} (V) = 20V$
- $R_{DS(on)} < 14m\Omega (V_{GS} = 4.5V)$
- $R_{DS(on)} < 18m\Omega (V_{GS} = 2.5V)$



### Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current <sup>A</sup>	$I_D$	$T_A=25^\circ C$	12.5
		$T_A=70^\circ C$	10
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	30	A
Power Dissipation	$P_D$	$T_A=25^\circ C$	2
		$T_A=70^\circ C$	1.28
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ C$

### Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	$t \leq 10s$	56	$^\circ C/W$
Maximum Junction-to-Ambient <sup>A</sup>		Steady-State	81	$^\circ C/W$
Maximum Junction-to-Lead <sup>C</sup>	$R_{\theta JL}$	40	48	$^\circ C/W$

**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	20			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C			1 5	μA
I <sub>GSS</sub>	Gate-Body leakage current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±10V			100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.4	0.6	1.2	V
I <sub>D(ON)</sub>	On state drain current	V <sub>GS</sub> =10V, V <sub>DS</sub> =5V	12			A
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =1A		11	14	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.5A		14	18	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =4.5A		11		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1.5A, V <sub>GS</sub> =0V		0.76	1.2	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current				2.7	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, f=1MHz		436		pF
C <sub>oss</sub>	Output Capacitance			66		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			44		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		3		Ω
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =5A		5.54		nC
Q <sub>gs</sub>	Gate Source Charge			1.26		nC
Q <sub>gd</sub>	Gate Drain Charge			0.52		nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> =5V, V <sub>DS</sub> =10V, R <sub>L</sub> =2Ω, R <sub>GEN</sub> =6Ω		5		ns
t <sub>r</sub>	Turn-On Rise Time			7		ns
t <sub>D(off)</sub>	Turn-Off DelayTime			29		ns
t <sub>f</sub>	Turn-Off Fall Time			6.2		ns
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =5A, di/dt=100A/μs		13.7		ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> =5A, di/dt=100A/μs		3.8		nC

A: The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25°C. The value in any a given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

C. The R<sub>θJA</sub> is the sum of the thermal impedance from junction to lead R<sub>θJL</sub> and lead to ambient.

D. The static characteristics in Figures 1 to 6 are obtained using 80μs pulses, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25°C. The SOA curve provides a single pulse rating.