FNK Semiconductor

FNK10N25A

Dual N-Channel Enhancement Mode Field Effect Transistor

General Description

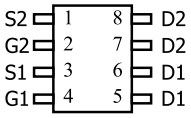
The FNK10N25A uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. They offer operation over a wide gate drive range from 1.8V to 8V. The two devices may be used individually, in parallel or to form a bidirectional blocking switch.

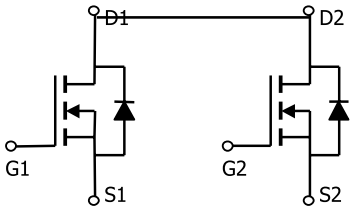
Features

V_{DS} (V) = 20V

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

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





Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current [A]	T_A=25°C	I_D	13	A
	T_A=70°C		11	
Pulsed Drain Current [B]		I_{DM}	30	
Power Dissipation	T_A=25°C	P_D	2	W
	T_A=70°C		1.28	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	56	62.5	°C/W
Maximum Junction-to-Ambient [A]	Steady-State		81	110	°C/W
Maximum Junction-to-Lead [C]	Steady-State	$R_{\theta JL}$	40	48	°C/W

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250μA, V_{GS}=0V	20			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V			1	μA
		T_J=55°C			5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}=±10V			100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} I_D=250μA	0.5	0.7	1.0	V
$I_{D(ON)}$	On state drain current	V_{GS}=10V, V_{DS}=5V	13			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=4.5V, I_D=1A		11	14	mΩ
		V_{GS}=2.5V, I_D=0.5A		15	18	mΩ
g_{FS}	Forward Transconductance	V_{DS}=10V,I_D=4.5A		11		S
V_{SD}	Diode Forward Voltage	I_S=1.5A,V_{GS} =0V		0.76	1.2	V
I_S	Maximum Body-Diode Continuous Current				2.7	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=10V, f=1MHz		436		pF
C_{oss}	Output Capacitance			66		pF
C_{rss}	Reverse Transfer Capacitance			44		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		3		Ω
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=4.5V, V_{DS}=10V, I_D=5A		5.54		nC
Q_{gs}	Gate Source Charge			1.26		nC
Q_{gd}	Gate Drain Charge			0.52		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=5V, V_{DS}=10V, R_L=2Ω, R_{GEN}=6Ω		5		ns
t_r	Turn-On Rise Time			7		ns
$t_{D(off)}$	Turn-Off DelayTime			29		ns
t_f	Turn-Off Fall Time			6.2		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=5A, dI/dt=100A/μs		13.7		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=5A, dI/dt=100A/μs		3.8		nC

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=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 $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JL}$ 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^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.