PROVISIONAL

VFET™

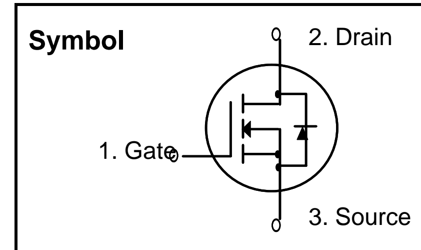
Wisdom Semiconductor

WFB33N25

N-Channel MOSFET

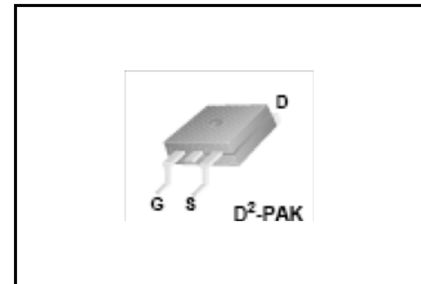
Features

- $R_{DS(on)}$ (Max 0.094 Ω)@V_{GS}=10V
- Gate Charge (Typical 37nC)
- Improved dv/dt Capability, High Ruggedness
- 100% Avalanche Tested
- Maximum Junction Temperature Range (150°C)



General Description

This Power MOSFET is produced using Wisdom's advanced planar stripe, DMOS technology. This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. These devices are well suited for high efficiency switching DC/DC converters, switch mode power supply, DC-AC converters for uninterruped power supply, motor control.



Absolute Maximum Ratings (* Drain current limited by junction temperature)

Symbol	Parameter	Value	Units
V_{DSS}	Drain to Source Voltage	250	V
I_D	Continuous Drain Current(@T_C = 25°C)	33*	A
	Continuous Drain Current(@T_C = 100°C)	20.4*	A
I_{DM}	Drain Current Pulsed (Note 1)	132*	A
V_{GS}	Gate to Source Voltage	±30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	918	mJ
E_{AR}	Repetitive Avalanche Energy (Note 1)	23.5	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	4.5	V/ns
P_D	Total Power Dissipation(@T_C = 25 °C)	235	W
	Derating Factor above 25 °C	1.89	W/°C
T_{STG}, T_J	Operating Junction Temperature & Storage Temperature	- 55 ~ 150	°C
T_L	Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds.	300	°C

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min.	Typ.	Max.	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	-	-	0.53	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	-	-	62.5	°C/W

Electrical Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	250	--	--	V
ΔBV_{DSS} / ΔT_J	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, Referenced to 25°C	--	0.25	--	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 250 V, V_{GS} = 0 V	--	--	10	μA
		V_{DS} = 200 V, T_C = 125°C	--	--	100	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 μA	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 16.5 A (Note 4)	--	0.077	0.094	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz	--	1650	--	pF
C_{oss}	Output Capacitance		--	330	--	pF
C_{rss}	Reverse Transfer Capacitance		--	40	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 125V, I_D = 33 A, R_G = 25 Ω (Note 4, 5)	--	40	--	ns
t_r	Turn-On Rise Time		--	230	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	80	--	ns
t_f	Turn-Off Fall Time		--	120	--	ns
Q_g	Total Gate Charge	V_{DS} = 200 V, I_D = 33A, V_{GS} = 10 V (Note 4, 5)	--	37	--	nC
Q_{gs}	Gate-Source Charge		--	10	--	nC
Q_{gd}	Gate-Drain Charge		--	20	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	33	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	130	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S =33 A	--	--	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0 V, I_S = 33 A, dI_F / dt = 100 A/μs (Note 4)	--	220	--	ns
Q_{rr}	Reverse Recovery Charge		--	1.8	--	μC

Notes:
1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%
3. Essentially independent of operating temperature