



Wisdom Semiconductor

PROVISIONAL

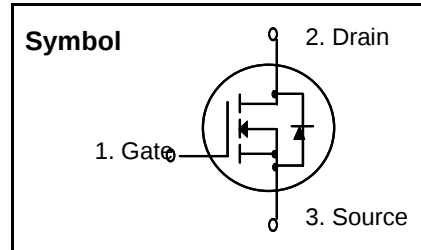
VFET™

WFB44N25

N-Channel MOSFET

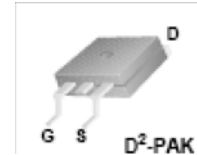
Features

- $R_{DS(on)}$ (Max 0.069 Ω) @ $V_{GS}=10V$
- Gate Charge (Typical 47nC)
- 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 uninterrupted 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(@ $T_C = 25^\circ C$)	44*	A
	Continuous Drain Current(@ $T_C = 100^\circ C$)	26.4*	A
I_{DM}	Drain Current Pulsed (Note 1)	170*	A
V_{GS}	Gate to Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	2050	mJ
E_{AR}	Repetitive Avalanche Energy (Note 1)	30.7	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	4.5	V/ns
P_D	Total Power Dissipation(@ $T_C = 25^\circ C$)	307	W
	Derating Factor above 25 °C	2.45	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	-	-	0.41	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	-	-	62.5	°C/W

Electrical Characteristics

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	250	--	--	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$, Referenced to 25°C	--	0.25	--	$\text{V}/^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 250\text{ V}, V_{GS} = 0\text{ V}$	--	--	10	μA
		$V_{DS} = 200\text{ V}, T_C = 125^\circ\text{C}$	--	--	100	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 22\text{ A}$	--	0.058	0.069	Ω

(Note 4)

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	2300	--	pF
C_{oss}	Output Capacitance		--	450	--	pF
C_{rss}	Reverse Transfer Capacitance		--	60	--	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 125\text{ V}, I_D = 44\text{ A},$ $R_G = 25\text{ }\Omega$	--	60	--	ns
t_r	Turn-On Rise Time		--	400	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	90	--	ns
t_f	Turn-Off Fall Time		--	120	--	ns
Q_g	Total Gate Charge	$V_{DS} = 200\text{ V}, I_D = 44\text{ A},$ $V_{GS} = 10\text{ V}$	--	50	--	nC
Q_{gs}	Gate-Source Charge		--	20	--	nC
Q_{gd}	Gate-Drain Charge		--	30	--	nC

(Note 4, 5)

Drain-Source Diode Characteristics and Maximum Ratings

I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	44	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	180	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 44 A	--	--	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0 V, I _S = 44 A, dI _F / dt = 100 A/μs	--	200	--	ns
Q _{rr}	Reverse Recovery Charge		--	1.8	--	μC

(Note 4)

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$
3. Essentially independent of operating temperature