VFET™

W **Wisdom** Semiconductor
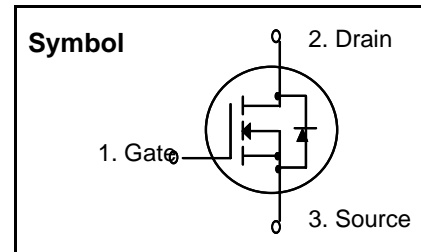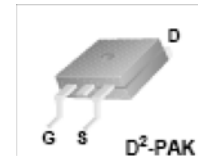
WFB44N25

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)

Symbol

2. Drain

1. Gate

3. Source

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.

D²-PAK

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)		44*	A
	Continuous Drain Current(@T_C = 100°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 °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 $T_C = 25°C$ 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
$\Delta BV_{DSS} / \Delta T_J$	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, $I_D = 22$ A	--	0.058	0.069	Ω

(Note 4)

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
C_{iss}	Input Capacitance	$V_{DS} = 25$ V, $V_{GS} = 0$ V, f = 1.0 MHz	--	2300	--	pF
C_{oss}	Output Capacitance		--	450	--	pF
C_{rss}	Reverse Transfer Capacitance		--	60	--	pF

Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 125$V, $I_D = 44$ A, $R_G = 25$ Ω	--	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 (Note 4, 5)	$V_{DS} = 200$ V, $I_D = 44$A, $V_{GS} = 10$ 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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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 $\leq$ 300μs, Duty cycle $\leq$ 2%
3. Essentially independent of operating temperature