WANSEMI
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WP5N50FA

Enhancement Mode N-Channel Power MOSFET

TO-220F/NMOS/500V/±30V/3V/5A/1.25Ω

Rev0.6

Enhancement Mode N-Channel Power MOSFET

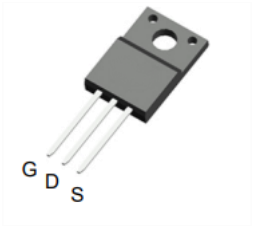
1.Features

- Fast Switching
- Improved dv/dt Capability

V_{DS}	$R_{DS(on)}$ Typ.	I_D Max.
500V	1.25Ω @ 10V	5A

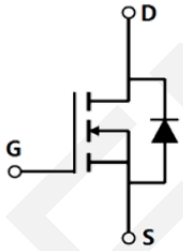
2.Applications

- Load Switch
- PWM Application
- Power management



Pin Description

TO-220F



Schematic Diagram

3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP5N50FA	WP5N50	TO-220F	50	5,000

4.Absolute Max Ratings at Ta=25℃ (Note1)

Parameter	Symbol	Value	Units
Drain to Source Voltage	V_{DS}	500	V
Gate to Source Voltage	V_{GS}	±30	V
Drain Current (DC)	I_D	5	A
Drain Current (Pulse), PW≤300μs	I_{DP}	18	A
Total Dissipation	P_D	35	W
Avalanche Energy, Single Pulsed	E_{AS}	203	mJ
Junction Temperature	T_j	150	℃
Storage Temperature	T_{stg}	-55 to +150	℃

Note 1: Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

5.Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to case	$R_{\theta JC}$	3.6	℃/W
Junction to ambient	$R_{\theta JA}$	65	℃/W

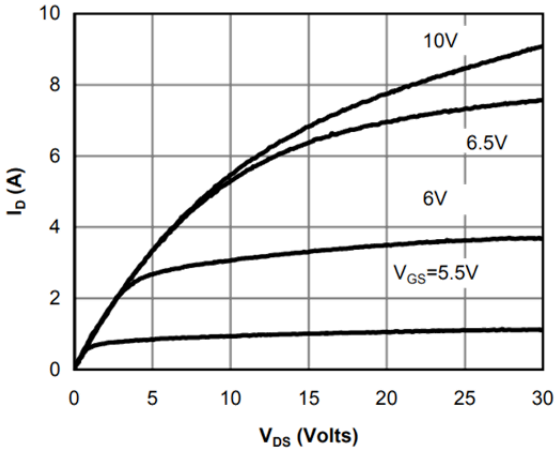
Note 2：When mounted on 1 inch square copper board t ≤ 10sec The value in any given application depends on the user's specific board design.

6.Electrical Characteristics at Ta=25℃ (Note 3)

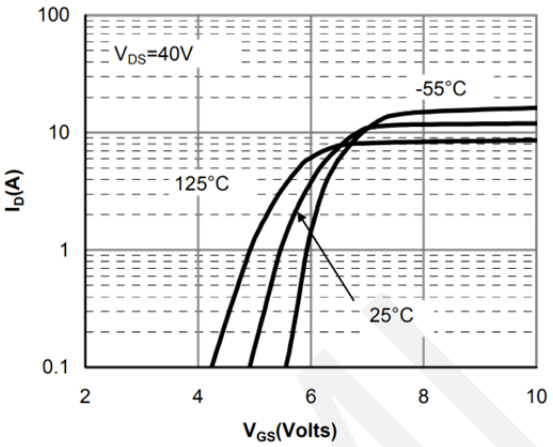
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 250μA, V_{GS} = 0V	500	535		V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS} = 500V, V_{GS} = 0V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = ±30V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	2	3	4	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	I_D = 2.5A, V_{GS} = 10V	-	1.25	1.5	Ω
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, Frequency=1.0MHz		517		pF
Output Capacitance	C_{oss}			57		pF
Reverse Transfer Capacitance	C_{rss}			4.9		pF
Turn-ON Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DS} = 250V, I_D = 5A, R_G = 25Ω		14.5		ns
Rise Time	t_r			29		ns
Turn-OFF Delay Time	$t_{d(off)}$			34.5		ns
Fall Time	t_f			24		ns
Total Gate Charge	Q_g	V_{DS} = 450V, V_{GS} = 10V, I_D = 5A		15.5		nC
	Q_{gs}			3.4		nC
	Q_{gd}			7.2		nC
Diode Forward Voltage	V_{FSD}	I_S = 5A, V_{GS} = 0		0.9	1.2	V

Note 3：Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

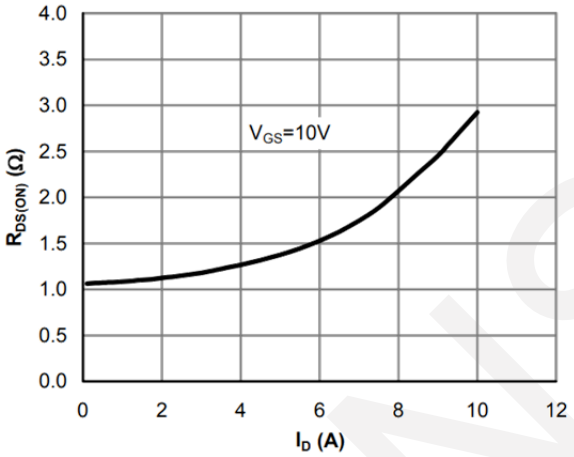
7.Typical electrical and thermal characteristics



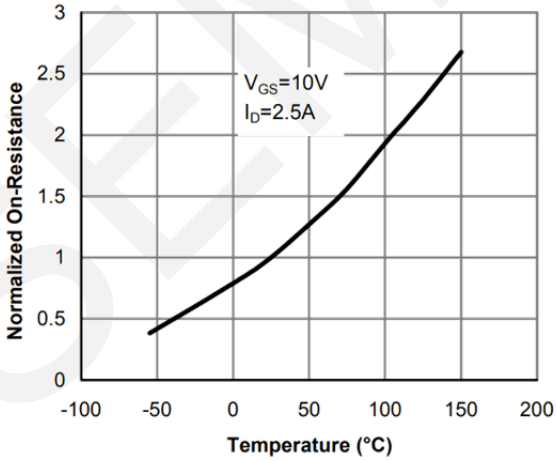
On-Region Characteristics



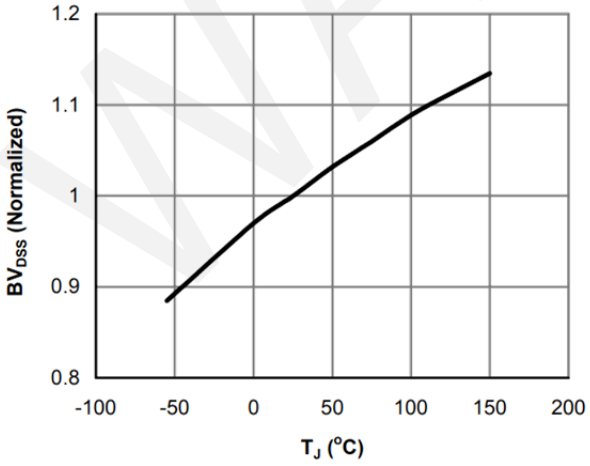
Transfer Characteristics



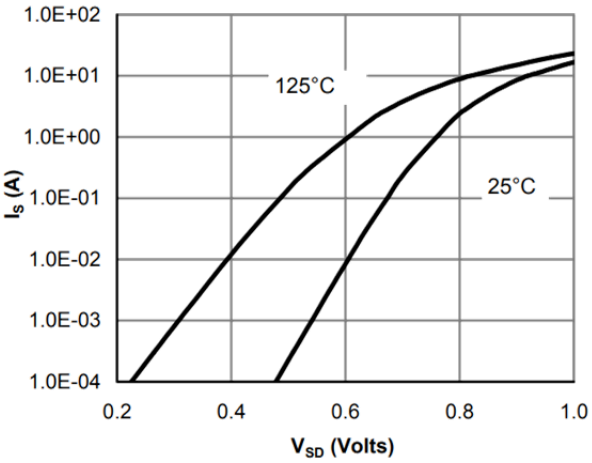
On-Resistance vs. Drain Current and Gate Voltage



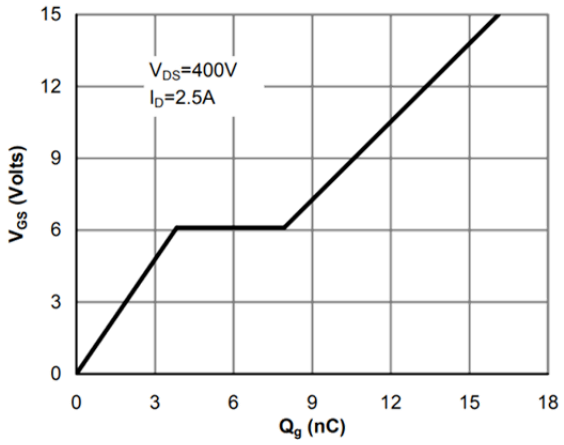
On-Resistance vs. Junction Temperature



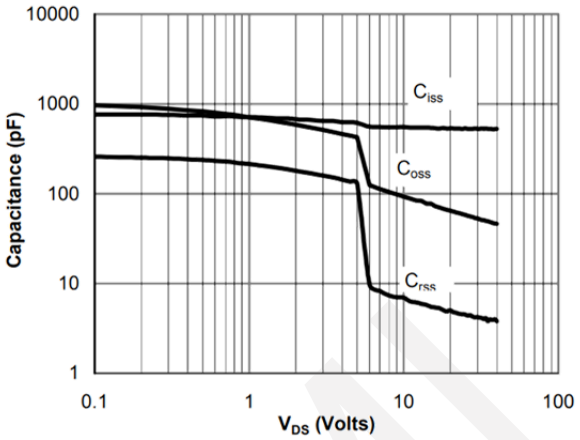
Break Down vs. Junction Temperature



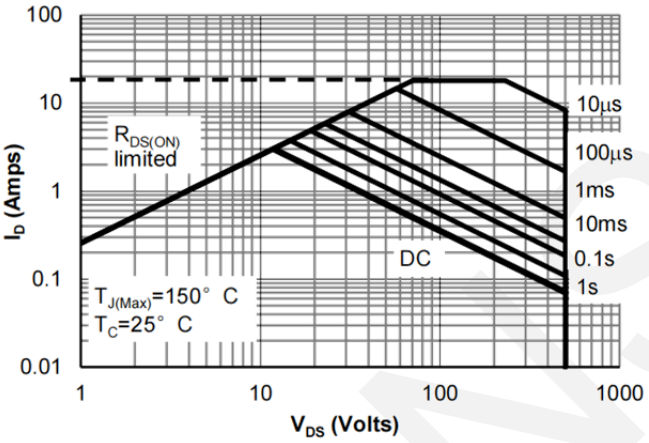
Body-Diode Characteristics



Gate-Charge Characteristics

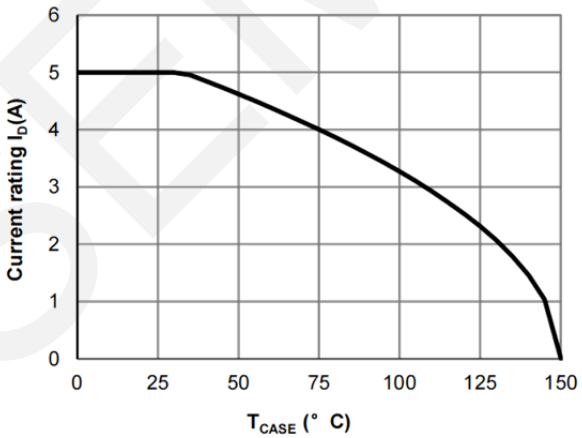


Capacitance Characteristics



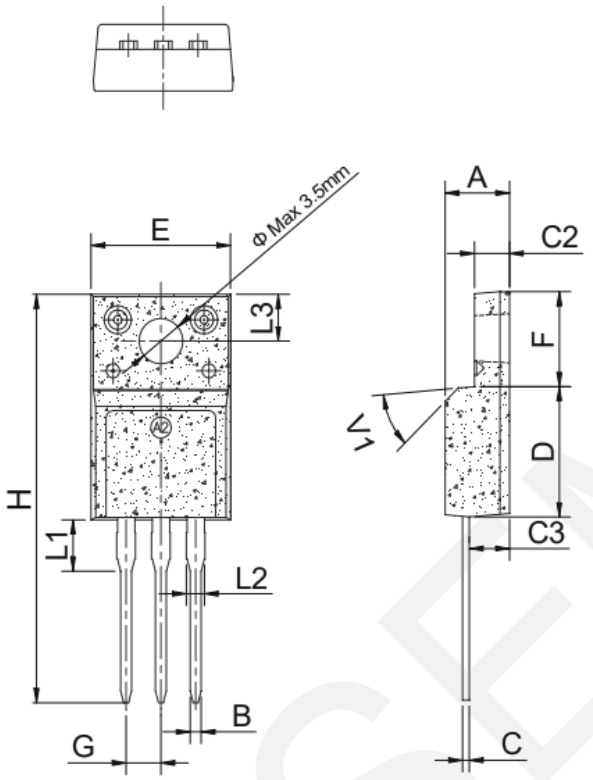
Maximum Forward Biased Safe

Operating Area



Current De-rating

8.Package Dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.50		4.90	0.177		0.193
B	0.74	0.80	0.83	0.029	0.031	0.033
C	0.47		0.65	0.019		0.026
C2	2.45		2.75	0.096		0.108
C3	2.60		3.00	0.102		0.118
D	8.80		9.30	0.346		0.366
E	9.80		10.4	0.386		0.410
F	6.40		6.80	0.252		0.268
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.63			0.143	
L2	1.14		1.70	0.045		0.067
L3		3.30			0.130	
V1		45°			45°	

9. Important Notice

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