

SPB100N03S203T-VB Datasheet N-Channel 30-V (D-S) MOSFET

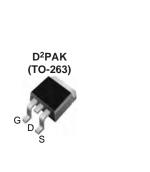
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N-Channel MOSFET

GO

PRODUCT SUMMARY					
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)	Q _g (Typ)		
30	0.0023 at V _{GS} = 10 V	150	82 nC		
	0.0032 at V _{GS} = 4.5 V	120	02 110		



FEATURES

- Trench Power MOSFET
- 100 % R_g and UIS Tested
- Compliant to RoHS Directive 2011/65/EU

APPLICATIONS

- OR-ing
- Server
- DC/DC •

Parameter		Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	30	V		
Gate-Source Voltage		V _{GS}		± 20	
	T _C = 25 °C		150		
Continuous Drain Current (T _J = 175 °C)	T _C = 70 °C		120		
	T _A = 25 °C	I _D	35.8 ^{b, c}	A	
	T _A = 70 °C		27 ^{b, c}	A	
Pulsed Drain Current		I _{DM}	500		
Avalanche Current Pulse	0.1 ml	I _{AS}	39		
Single Pulse Avalanche Energy L = 0.1 mH		E _{AS}	94.8	mJ	
Continuous Source-Drain Diode Current	T _C = 25 °C	1-	90 ^{a, e}		
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	3.13 ^{b, c}	- A	
	T _C = 25 °C		250 ^a		
Maximum Power Dissipation	T _C = 70 °C		175		
	T _A = 25 °C	P _D	3.75 ^{b, c}	W	
	T _A = 70 °C		2.63 ^{b, c}		
Operating Junction and Storage Temperature R	T _J , T _{stq}	- 55 to 175	°C		

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Тур.	Max.	Unit	
Maximum Junction-to-Ambient ^{b, d}	$t \le 10 \text{ sec}$	R _{thJA}	32	40	°C/W	
Maximum Junction-to-Case	Steady State	R _{thJC}	0.5	0.6		

Notes:

a. Based on $T_C = 25$ °C. b. Surface mounted on 1" x 1" FR4 board. c. t = 10 sec.

d. Maximum under steady state conditions is 90 °C/W.

SPECIFICATIONS ($T_J = 25 \text{ °C}$, unless otherwise noted)								
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit		
Static								
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 V, I_{D} = 250 \mu A$	30			V		
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	I _D = 250 μA		35		- mV/°C		
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	$I_D = 250 \mu A$		- 7.5				
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	1.5		2.5	V		
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA		
Zero Gate Voltage Drain Current	1	$V_{DS} = 30 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$	1		1			
	I _{DSS}	$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 \text{ °C}$			10	μA		
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, \text{ V}_{GS} = 10 \text{ V}$	90			А		
Drain-Source On-State Resistance ^a	В	V _{GS} = 10 V, I _D = 38.8 A		0.0023		Ω		
	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, \text{ I}_{D} = 37 \text{ A}$		0.0032				
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 38.8 A		160		S		
Dynamic ^b								
Input Capacitance	C _{iss}			6201		pF		
Output Capacitance	C _{oss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz		1725				
Reverse Transfer Capacitance	C _{rss}			970				
		V _{DS} = 15 V, V _{GS} = 10 V, I _D = 38.8 A		171	257	nC		
Total Gate Charge	Qg			81.5	123			
Gate-Source Charge	Q _{gs}	V_{DS} = 15 V, V_{GS} = 4.5 V, I_{D} = 28.8 A		34				
Gate-Drain Charge	Q _{gd}			29				
Gate Resistance	Rg	f = 1 MHz		1.4	2.1	Ω		
Turn-On Delay Time	t _{d(on)}			18	27	ns		
Rise Time	t _r	V_{DD} = 15 V, R_{L} = 0.625 Ω		11	17			
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 24 \text{ A}, \text{ V}_{\text{GEN}} = 10 \text{ V}, \text{ R}_g = 1 \Omega$		70	105			
Fall Time	t _f			10	15			
Turn-On Delay Time	t _{d(on)}			55	83			
Rise Time	t _r	V_{DD} = 15 V, R ₁ = 0.67 Ω		180	270			
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 22.5 \text{ A}, \text{ V}_{\text{GEN}} = 4.5 \text{ V}, \text{ R}_{\text{g}} = 1 \Omega$		55	83			
Fall Time	t _f			12	18			
Drain-Source Body Diode Characteristic	s							
Continuous Source-Drain Diode Current	۱ _S	T _C = 25 °C			120			
Pulse Diode Forward Current ^a	I _{SM}				120	A		
Body Diode Voltage	V _{SD}	I _S = 22 A		0.8	1.2	V		
Body Diode Reverse Recovery Time	t _{rr}	-		52	78	ns		
Body Diode Reverse Recovery Charge	Q _{rr}			70.2	105	nC		
Reverse Recovery Fall Time	t _a	$I_F = 20 \text{ A}, \text{ di/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 \text{ °C}$		27		ns		
Reverse Recovery Rise Time	t _b			25				

Notes:

a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle ≤ 2 %.

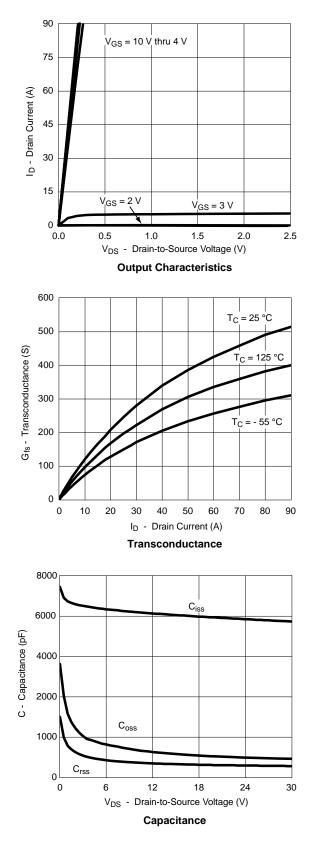
b. Guaranteed by design, not subject to production testing.

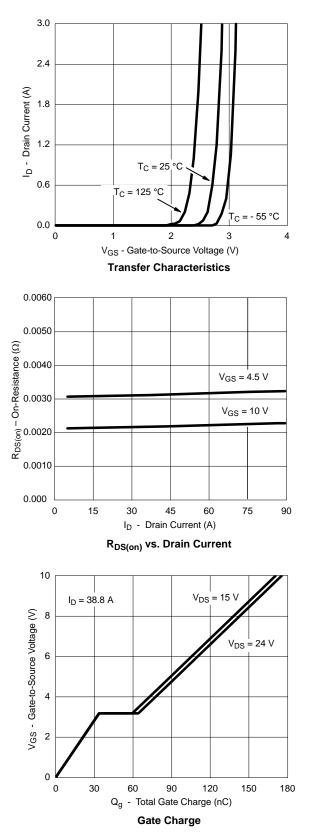
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

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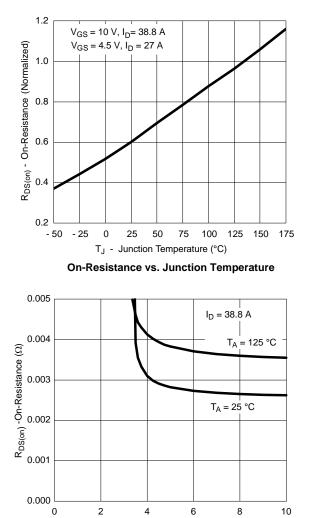
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



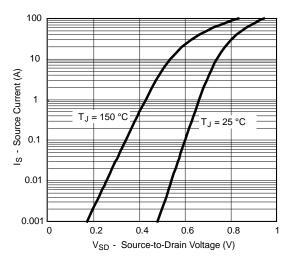




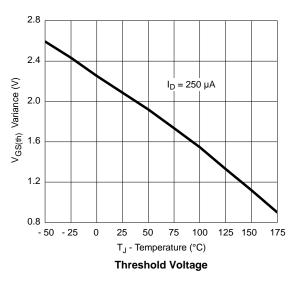
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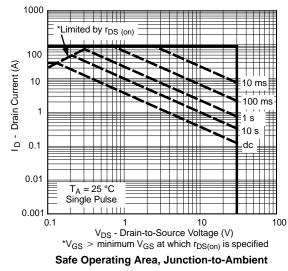


 V_{GS} - Gate-to-Source Voltage (V) R_{DS(on)} vs. V_{GS} vs. Temperature

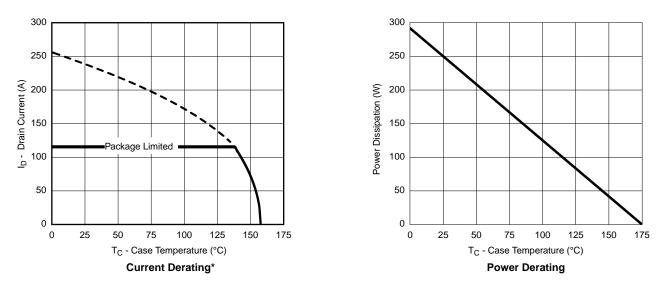












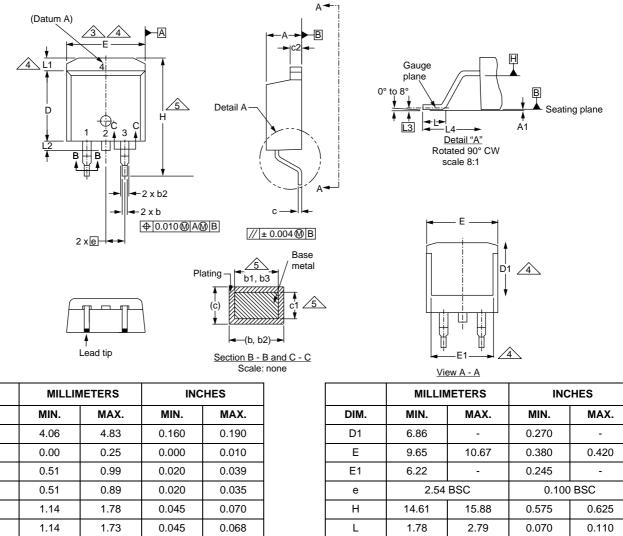
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

*The power dissipation P_D is based on $T_{J(max)} = 175$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.





TO-263AB (HIGH VOLTAGE)



ECN: S-82110-Rev. A, 15-Sep-08

0.38

0.38

1.14

8.38

DWG: 5970 Notes

DIM.

А

A1

b

b1

b2

b3

с

c1

c2

D

- 1. Dimensioning and tolerancing per ASME Y14.5M-1994.
- 2. Dimensions are shown in millimeters (inches).
- 3. Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body at datum A.

L1

L2

L3

L4

-

-

4.78

1.65

1.78

5.28

0.25 BSC

4. Thermal PAD contour optional within dimension E, L1, D1 and E1.

0.74

0.58

1.65

9.65

0.015

0.015

0.045

0.330

0.029

0.023

0.065

0.380

- 5. Dimension b1 and c1 apply to base metal only.
- 6. Datum A and B to be determined at datum plane H.
- 7. Outline conforms to JEDEC outline to TO-263AB.

0.066

0.070

0.208

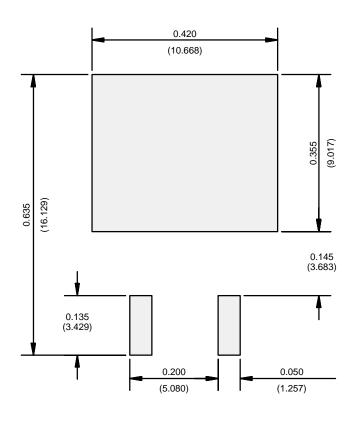
0.010 BSC

-

0.188



RECOMMENDED MINIMUM PADS FOR D²PAK: 3-Lead



Recommended Minimum Pads Dimensions in Inches/(mm)



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