

SPB80N03S2-03-VB Datasheet N-Channel 30-V (D-S) MOSFET

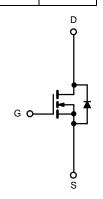
PRODUCT SUMMARY					
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A)	Q _g (Typ)		
30	0.0023 at V _{GS} = 10 V	150	82 nC		
30	0.0032 at V _{GS} = 4.5 V	120	02 110		

FEATURES

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







APPLICATIONS

- OR-ing
- Server
- DC/DC

N-Channel MOSFET

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. – 175 °C)	T _C = 70 °C		120		
Continuous Drain Current (T _J = 175 °C)	T _A = 25 °C	I _D	35.8 ^{b, c}	A	
	T _A = 70 °C		27 ^{b, c}		
Pulsed Drain Current		I _{DM}	500		
Avalanche Current Pulse	L = 0.1 mH	I _{AS}	39		
Single Pulse Avalanche Energy	L = 0.1 IIII	E _{AS}	94.8	mJ	
Continuous Source-Drain Diode Current	T _C = 25 °C	I.	90 ^{a, e}	_	
Continuous Source-Diam 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	В	175	w	
	T _A = 25 °C	P _D	3.75 ^{b, c}	VV	
	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 ≤ 10 sec	R _{thJA}	32	40	°C/W	
Maximum Junction-to-Case	Steady State	R _{thJC}	0.5	0.6	- C/VV	

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.



Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	30			V
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	1 - 250 uA		35		mV/°C
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_{J}$	I _D = 250 μA		- 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}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zara Oata Vallana Basis Oamad		$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}$			1	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V, T _J = 55 °C			10	μA
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	90			Α
		$V_{GS} = 10 \text{ V}, I_D = 38.8 \text{ A}$		0.0023		Ω
Drain-Source On-State Resistance ^a	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, I_D = 37 \text{ A}$		0.0032		
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 38.8 A		160		S
Dynamic ^b						I
Input Capacitance	C _{iss}			6201		
Output Capacitance	C _{oss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		1725		pF
Reverse Transfer Capacitance	C _{rss}			970		
Total Cata Channa	Qg	$V_{DS} = 15 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 38.8 \text{ A}$		171	257	nC
Total Gate Charge				81.5	123	
Gate-Source Charge	Q _{gs}	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_{D} = 28.8 \text{ A}$		34		
Gate-Drain Charge	Q _{gd}			29		
Gate Resistance	R _g	f = 1 MHz		1.4	2.1	Ω
Turn-On Delay Time	t _{d(on)}			18	27	
Rise Time	t _r	V_{DD} = 15 V, R_L = 0.625 Ω		11	17	- ns
Turn-Off Delay Time	t _{d(off)}	$I_D\cong 24$ A, V_{GEN} = 10 V, R_g = 1 Ω		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_L = 0.67 Ω		180	270	
Turn-Off Delay Time	t _{d(off)}	$I_D\cong 22.5$ A, V_{GEN} = 4.5 V, R_g = 1 Ω		55	83	
Fall Time	t _f			12	18	
Drain-Source Body Diode Characteristic	:s					
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			120	А
Pulse Diode Forward Current ^a	I _{SM}				120	
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}	1 20 A di/dt 100 A/v- T 05 00		70.2	105	nC
Reverse Recovery Fall Time	t _a	$I_F = 20 \text{ A}, \text{ di/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 ^{\circ}\text{C}$		27		1
Reverse Recovery Rise Time	-			25		ns

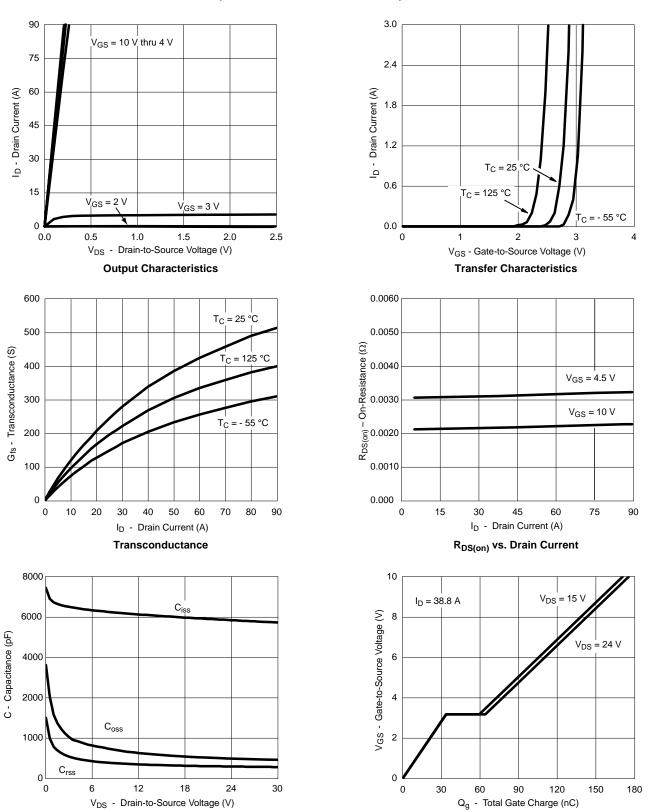
Notes:

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



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



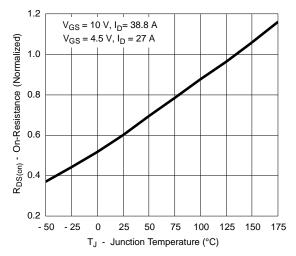
服务热线:400-655-8788

Capacitance

Gate Charge



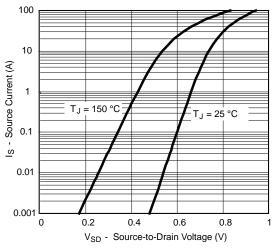
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



On-Resistance vs. Junction Temperature



 $\rm R_{\rm DS(on)}$ vs. $\rm V_{\rm GS}$ vs. Temperature



Forward Diode Voltage vs. Temperature



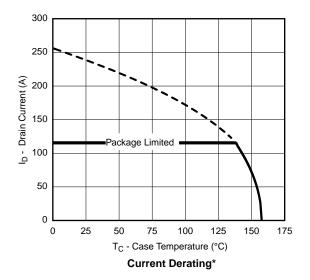
Threshold Voltage



Safe Operating Area, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)





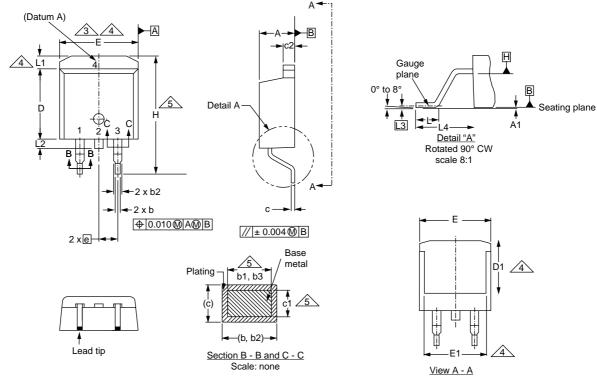
*The power dissipation P_D is based on $T_{J(max)}$ = 175 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



Normalized Thermal Transient Impedance, Junction-to-Case



TO-263AB (HIGH VOLTAGE)



	MILLIMETERS		INC	HES
DIM.	MIN.	MAX.	MIN.	MAX.
А	4.06	4.83	0.160	0.190
A1	0.00	0.25	0.000	0.010
b	0.51	0.99	0.020	0.039
b1	0.51	0.89	0.020	0.035
b2	1.14	1.78	0.045	0.070
b3	1.14	1.73	0.045	0.068
С	0.38	0.74	0.015	0.029
c1	0.38	0.58	0.015	0.023
c2	1.14	1.65	0.045	0.065
D	8.38	9.65	0.330	0.380

	MILLIMETERS		INC	HES
DIM.	MIN.	MAX.	MIN.	MAX.
D1	6.86	-	0.270	-
Е	9.65	10.67	0.380	0.420
E1	6.22	-	0.245	-
е	2.54	2.54 BSC 0.100 BSC		BSC
Н	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	-	1.65	-	0.066
L2	-	1.78	-	0.070
L3	0.25 BSC		0.010	BSC
L4	4.78	5.28	0.188	0.208

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

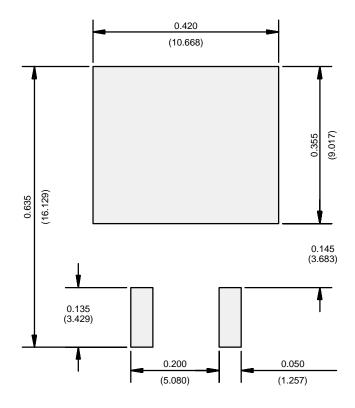
DWG: 5970

Notes

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



RECOMMENDED MINIMUM PADS FOR D²PAK: 3-Lead



Recommended Minimum Pads Dimensions in Inches/(mm)



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