

SSW60N05-VB Datasheet

N-Channel 60-V (D-S) MOSFET

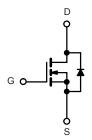
PRODUCT SUMMARY		
V _{DS}	60	V
$R_{DS(on)} V_{GS} = 10 V$	11	mΩ
$R_{DS(on)}$ $V_{GS} = 4.5 \text{ V}$	12	mΩ
I _D	75	Α
Configuration	Sin	gle

FEATURES

- 175 °C Junction Temperature
- Trench Power MOSFET







N-Channel MOSFET

Parameter		Symbol	Limit	Unit
Gate-Source Voltage	V _{GS}	± 20	V	
Continuous Drain Current (T _J = 175 °C) ^b	T _C = 25 °C	1	75	
	T _C = 100 °C	I _D	50 ^a	
Pulsed Drain Current	I _{DM}	200	А	
Continuous Source Current (Diode Conduction)	I _S	50 ^a		
Avalanche Current	I _{AS}	50		
Single Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH	E _{AS}	125	mJ
Maximum Power Dissipation	T _C = 25 °C	P _D	136	W
	T _A = 25 °C	3 ^b , 8.3 ^{b, c}	3 ^b , 8.3 ^{b, c}	T vv
Operating Junction and Storage Temperature Range	•	T _J , T _{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	t ≤ 10 sec	R_{thJA}	15	18	°C/W
	Steady State		40	50	
Maximum Junction-to-Case		R _{thJC}	0.85	1.1	

Notes:

- a. Package limited.
- b. Surface mounted on 1" x 1" FR4 board.
- c. $t \le 10 \text{ s}$.

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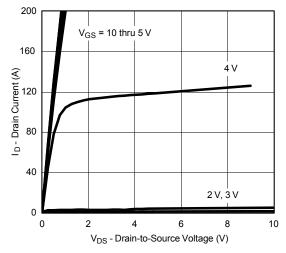
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit	
Static			'		<u> </u>		
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	60			V	
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	1		3	V	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
		V _{DS} = 60 V, V _{GS} = 0 V			1	μA	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V, T _J = 125 °C			50		
		V _{DS} = 60 V, V _{GS} = 0 V, T _J = 175 °C			250	1	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	60			Α	
		V _{GS} = 10 V, I _D = 20 A		0.011		1	
D : 0	D	V _{GS} = 10 V, I _D = 20 A, T _J = 125 °C		0.016			
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A, T _J = 175 °C		0.020		Ω	
		V _{GS} = 4.5 V, I _D = 15 A		0.012			
Forward Transconductance ^b	9 _{fs}	V _{DS} = 15 V, I _D = 20 A		60		S	
Dynamic				•			
Input Capacitance	C _{iss}			4300			
Output Capacitance	C _{oss}	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$		470		pF	
Reverse Transfer Capacitance	C _{rss}			225			
Total Gate Charge ^c	Q_g			47			
Gate-Source Charge ^c	Q _{gs}	$V_{DS} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_{D} = 50 \text{ A}$		10		nC	
Gate-Drain Charge ^c	Q _{gd}			12			
Turn-On Delay Time ^c	t _{d(on)}			10	20		
Rise Time ^c	t _r	$V_{DD} = 30 \text{ V, R}_{L} = 0.6 \Omega$		15	25		
Turn-Off Delay Time ^c	t _{d(off)}	$I_D \cong 50 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 2.5 \Omega$		35	50	ns	
Fall Time ^c	t _f			20	30		
Source-Drain Diode Ratings and Cha	aracteristics (T _C = 25 °C)					
Pulsed Current	I _{SM}				60	Α	
Diode Forward Voltage	V _{SD}	I _F = 20 A, V _{GS} = 0 V		1	1.5	V	
Reverse Recovery Time	t _{rr}	I _F = 20 A, di/dt = 100 A/μs		45	100	ns	

- a. For design aid only; not subject to production testing. b. Pulse test; pulse width \leq 300 μ s, duty cycle \leq 2 %.
- c. Independent of operating temperature.

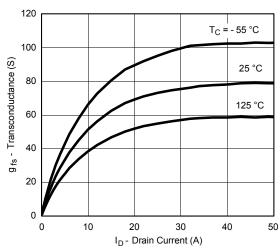
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



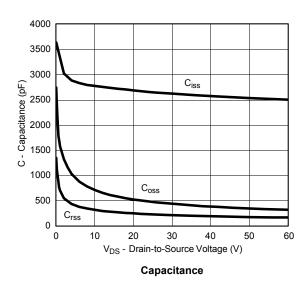
TYPICAL CHARACTERISTICS (25 °C unless noted)



Output Characteristics

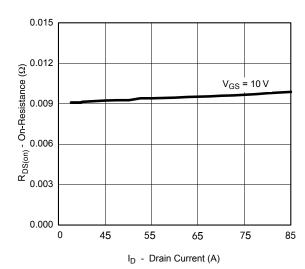


Transconductance

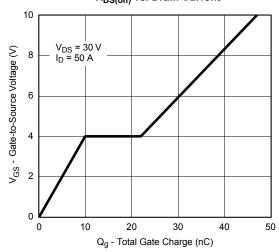


100 80 I_D - Drain Current (A) 60 40 T_C = 125 °C 20 25 °C - 55 °C 0 0 1 2 3 4 5 V_{GS} - Gate-to-Source Voltage (V)

Transfer Characteristics



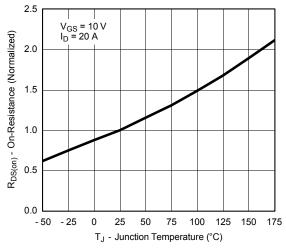
R_{DS(on)} vs. Drain Current



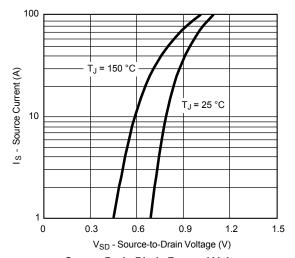
Gate Charge



TYPICAL CHARACTERISTICS (25 °C unless noted)



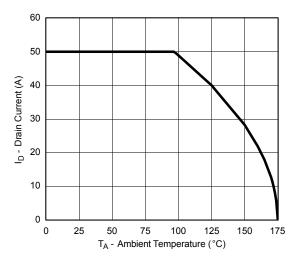
On-Resistance vs. Junction Temperature

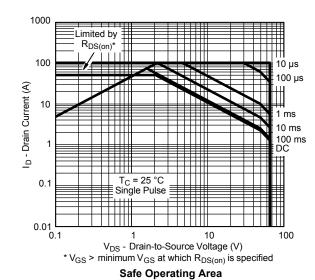


Source-Drain Diode Forward Voltage

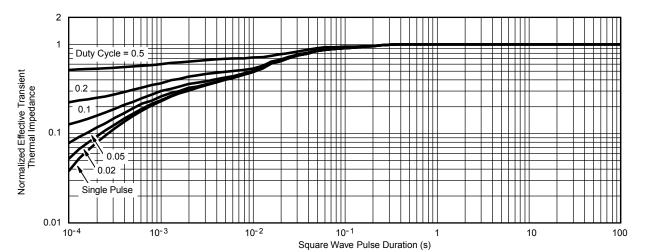


THERMAL RATINGS





Maximum Drain Current vs. Ambient Temperature



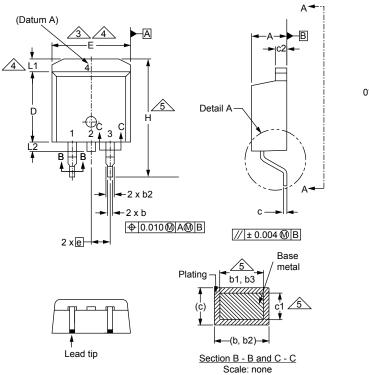
Normalized Thermal Transient Impedance, Junction-to-Case

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TO-263AB (HIGH VOLTAGE)



INCHES

MAX.

0.190

0.010

0.039

0.035

0.070

0.068

0.029

0.023

0.065

0.380

MIN.

0.160

0.000

0.020

0.020

0.045

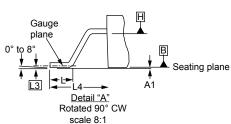
0.045

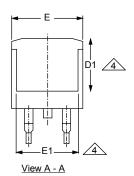
0.015

0.015

0.045

0.330





<u>and</u>	С	-
one		
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	MILLIN	METERS	INC	HES	
DIM.	MIN.	MAX.	MIN.	MA	
D1	6.86	-	0.270		
Е	9.65	10.67	0.380	0.4	
E1	6.22	-	0.245		
е	2.54	BSC	0.100 BSC		
Н	14.61	15.88	0.575	0.6	
L	1.78	2.79	0.070	0.1	
L1	-	1.65	-	0.0	
L2	-	1.78	-	0.0	
L3	0.25	BSC	0.010	BSC	
L4	4.78	5.28	0.188	0.2	

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

DWG: 5970

DIM.

Α

Α1

b

b1 b2

b3

С

c1 c2

D

1. Dimensioning and tolerancing per ASME Y14.5M-1994.

MILLIMETERS

MAX.

4.83

0.25

0.99

0.89

1.78

1.73

0.74

0.58

1.65

9.65

MIN.

4.06

0.00

0.51 0.51

1.14

1.14

0.38

0.38

1.14

- 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.

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MAX.

0.420

0.625

0.110

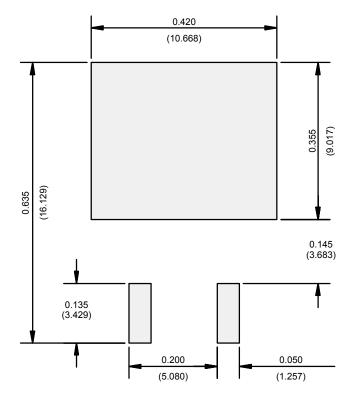
0.066

0.070

0.208



RECOMMENDED MINIMUM PADS FOR D²PAK: 3-Lead



Recommended Minimum Pads Dimensions in Inches/(mm)



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