

SPB08P06P G-VB Datasheet

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

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
- 60	0.064 at $V_{GS} = - 10$ V	- 30	12
	0.077 at $V_{GS} = - 4.5$ V	- 28	

FEATURES

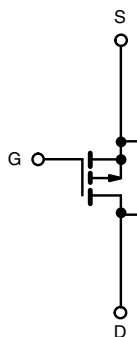
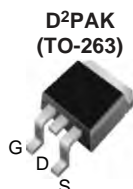
- Trench Power MOSFET 100
- % UIS Tested

APPLICATIONS

- Load Switch



RoHS
COMPLIANT
HALOGEN
FREE



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_C = 25\text{ }^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Limit	Unit
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_J = 175\text{ }^\circ\text{C}$)	I_D	$T_C = 25\text{ }^\circ\text{C}$ - 30	A
		$T_C = 100\text{ }^\circ\text{C}$ - 20	
Pulsed Drain Current	I_{DM}	- 90	
Continuing Source Current (Diode Conduction)	I_S	- 28	
Avalanche Current	I_{AS}	- 31	
Single Pulse Avalanche Energy	E_{AS}	7.2	mJ
Maximum Power Dissipation	P_D	$T_C = 25\text{ }^\circ\text{C}$ 60 ^a	W
		$T_A = 25\text{ }^\circ\text{C}$ 6 ^b	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^b	R_{thJA}	$t \leq 10$ sec 20	25	$^\circ\text{C/W}$
		Steady State 62	75	
Junction-to-Case	R_{thJC}	5	6	

Notes:

a. See SOA curve for voltage derating.

b. Surface Mounted on 1" x 1" FR-4 board.

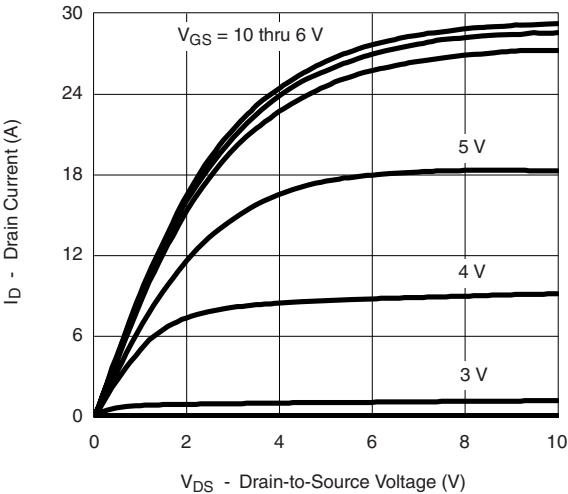
SPECIFICATIONS T _J = 25 °C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ ^a	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = - 250 μA	- 60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1.0	- 2.0	- 3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 60 V, V _{GS} = 0 V			- 1	μA
		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			- 150	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = - 5 V, V _{GS} = - 10 V	- 10			A
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = - 10 V, I _D = - 5 A		0.064		Ω
		V _{GS} = - 10 V, I _D = - 5 A, T _J = 125 °C		0.110		
		V _{GS} = - 10 V, I _D = - 5 A, T _J = 175 °C		0.250		
		V _{GS} = - 4.5 V, I _D = - 2 A		0.077		
Forward Transconductance ^b	g _{fs}	V _{DS} = - 15 V, I _D = - 5 A		8		S
Dynamic						
Input Capacitance	C _{iss}	V _{DS} = - 25 V, V _{GS} = 0 V, f = 1 MHz		1000		pF
Output Capacitance	C _{oss}			210		
Reverse Transfer Capacitance	C _{rss}			110		
Total Gate Charge	Q _g	V _{DS} = - 30 V, V _{GS} = - 10 V, I _D = - 8.4 A		12.5	19	nC
Gate-Source Charge	Q _{gs}			2.3		
Gate-Drain Charge	Q _{gd}			3.2		
Gate Resistance	R _g	f = 1 MHz		8.0		Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = - 30 V, R _L = 3.57 Ω I _D ≅ - 8.4 A, V _{GEN} = - 10 V, R _G = 2.5 Ω		5	10	ns
Rise Time ^c	t _r			14	25	
Turn-Off Delay Time ^c	t _{d(off)}			15	25	
Fall Time ^c	t _f			7	12	
Source-Drain Diode Ratings and Characteristics (T _C = 25 °C) ^b						
Pulsed Current	I _{SM}				- 30	A
Forward Voltage ^b	V _{SD}	I _F = - 2 A, V _{GS} = 0 V		- 0.9	- 1.3	V
Reverse Recovery Time	t _{rr}	I _F = - 8 A, di/dt = 100 A/μs		50	80	ns
Reverse Recovery Time	Q _{rr}			80	120	nC

Notes:

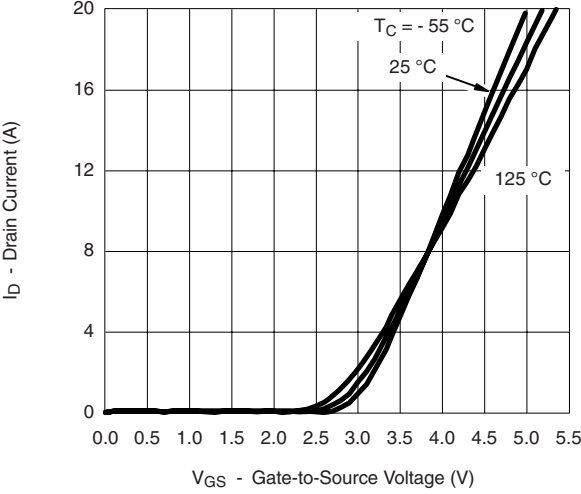
- a. Guaranteed by design, not subject to production testing.
 b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 c. Independent of operating temperature.

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.

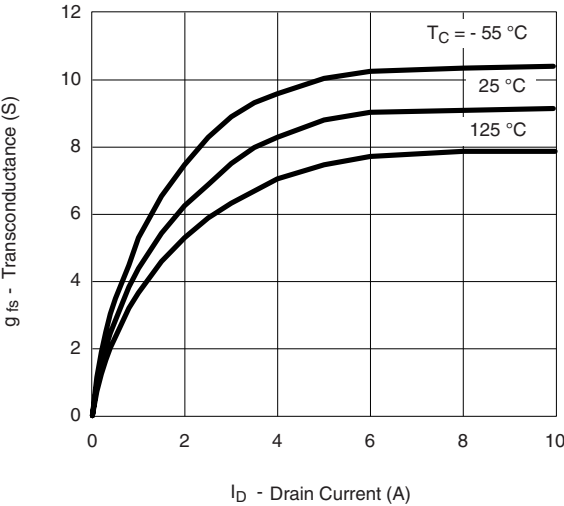
TYPICAL CHARACTERISTICS 25 °C unless noted



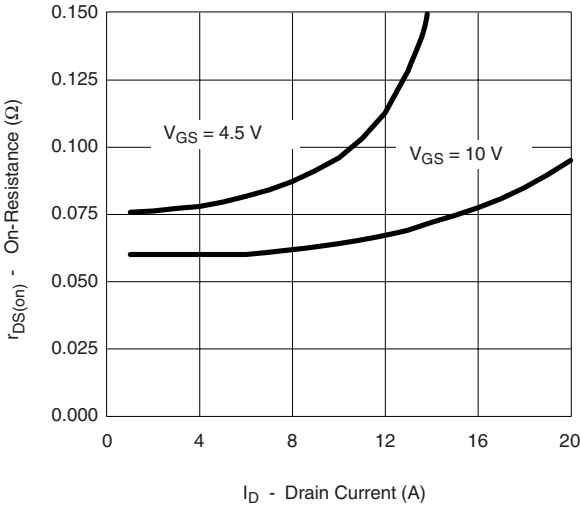
Output Characteristics



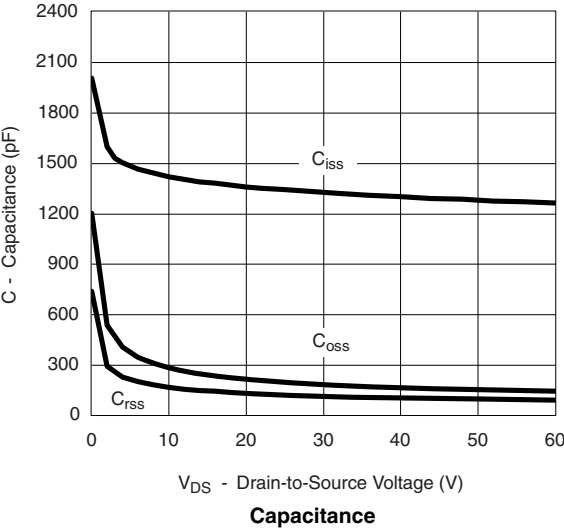
Transfer Characteristics



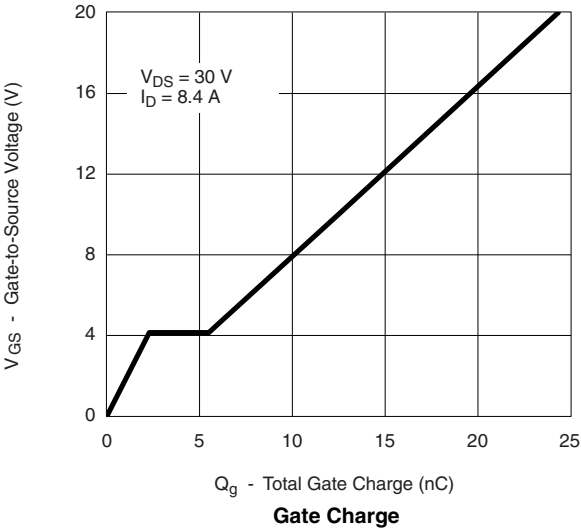
Transconductance



On-Resistance vs. Drain Current

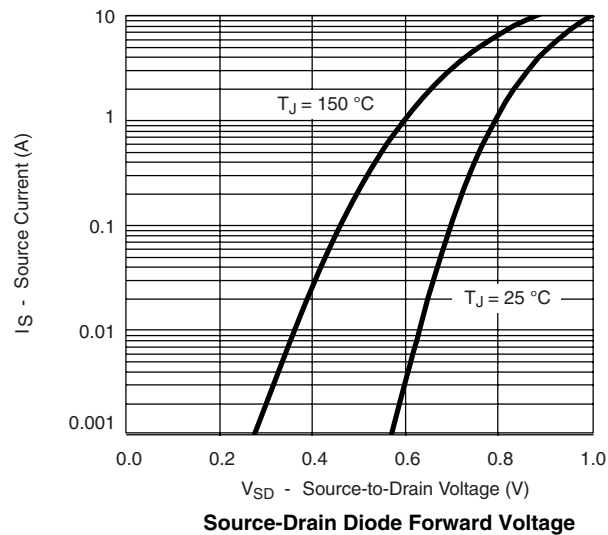
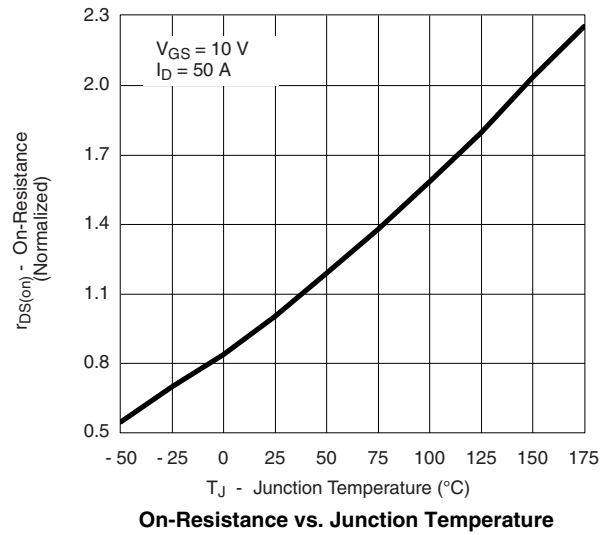


Capacitance

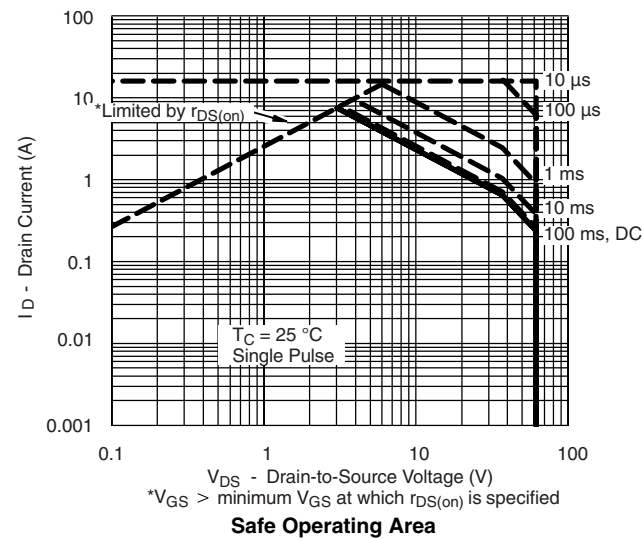
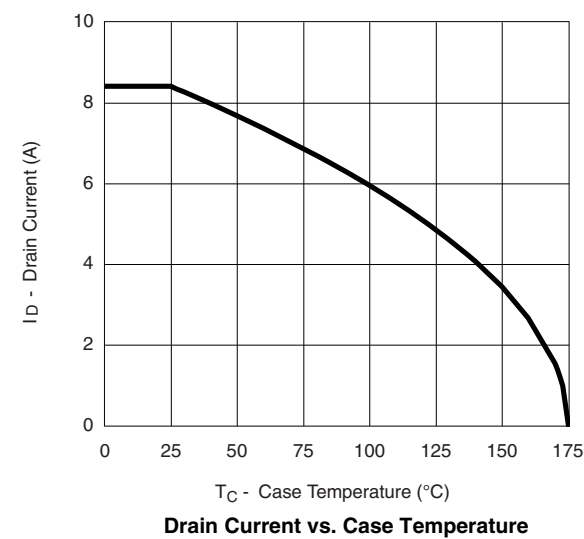


Gate Charge

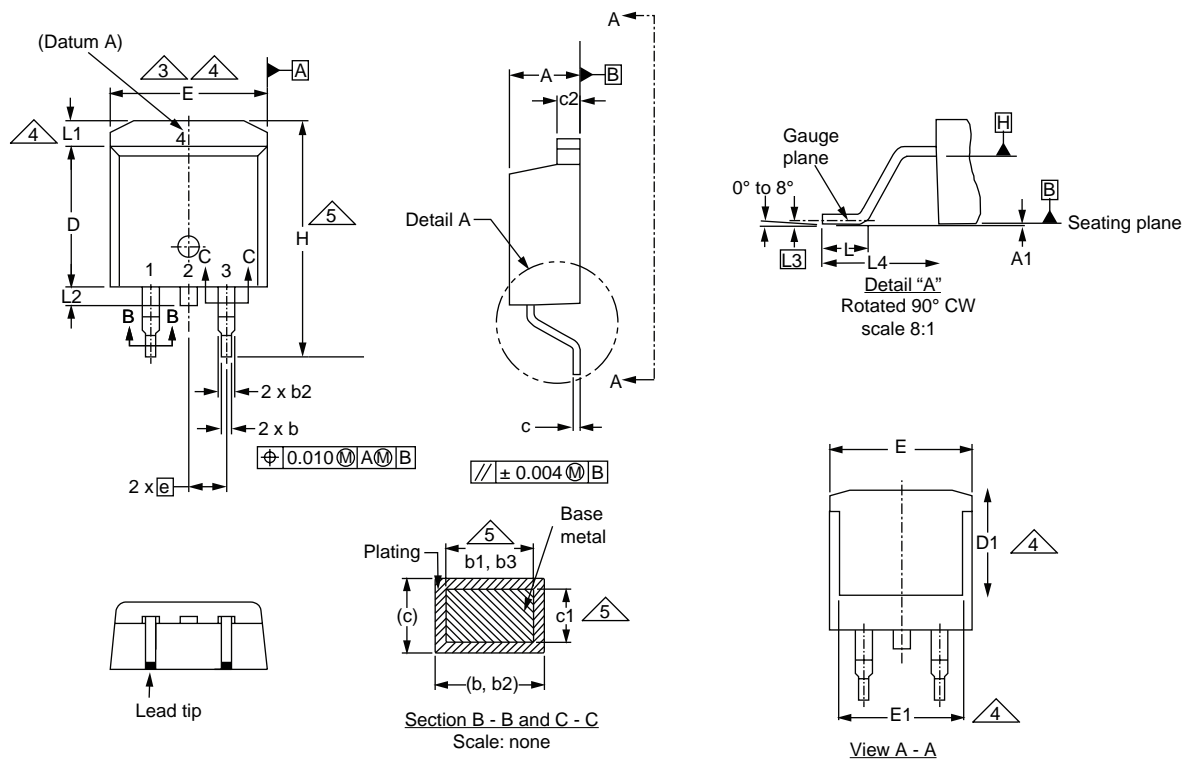
TYPICAL CHARACTERISTICS 25 °C unless noted



THERMAL RATINGS



THERMAL RATINGS**Normalized Thermal Transient Impedance, Junction-to-Ambient****Normalized Thermal Transient Impedance, Junction-to-Case**

TO-263AB

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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