VBsemi

BSC200P03LS G-VB Datasheet
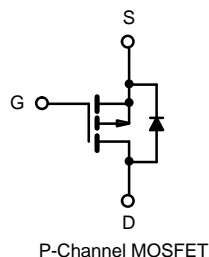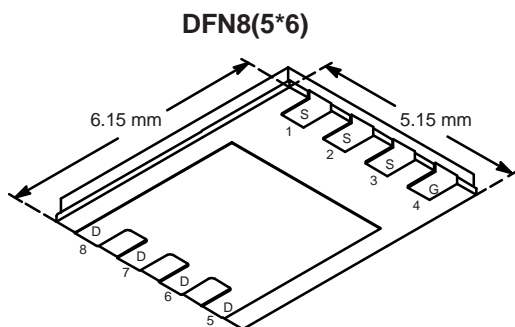
P-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D [a]	Q_g (Typ.)
- 30	0.0080 at V_{GS} = - 10 V	- 60	66 nC
	0.0090 at V_{GS} = - 6 V	- 53	
	0.0120 at V_{GS} = - 4.5 V	- 50	

FEATURES

- Extended V_{GS} range (± 25 V) for adaptor switch applications
- Extremely low $R_{DS(on)}$
- Trench Power MOSFET
- 100 % R_g and UIS Tested

Pb-free

RoHS COMPLIANT

DFN8(5*6)

6.15 mm   5.15 mm

P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	- 30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	- 60	A
	T_C = 70 °C		- 50.7	
	T_A = 25 °C		- 47.3	
	T_A = 70 °C		- 43.9 [b, c]	
Pulsed Drain Current (t = 300 µs)		I_{DM}	- 150	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	- 58 [b, c]	
	T_A = 25 °C		- 46 [b, c]	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	- 40	
Single Pulse Avalanche Energy		E_{AS}	80	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	75	W
	T_C = 70 °C		40	
	T_A = 25 °C		3.1 [b, c·]	
	T_A = 70 °C		2 [b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[b, d]	t ≤ 10 s	R_{thJA}	33	40	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	15	17	

Notes:
a. Based on T_C = 25 °C.
b. Surface mounted on 1" x 1" FR4 board.
c. t = 10 s.
d. Maximum under steady state conditions is 90 °C/W.

400- 655- 8788

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)

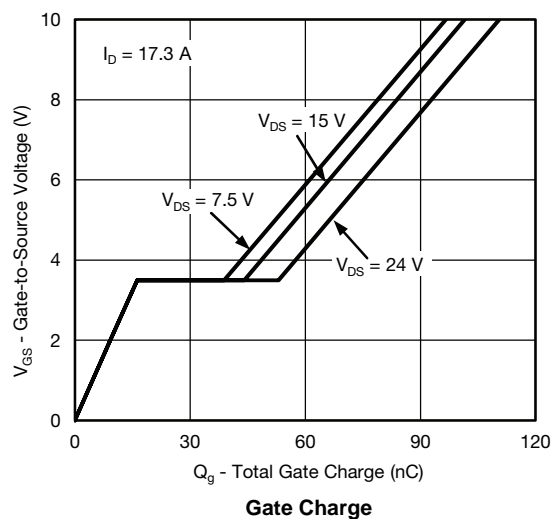| Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = - 250 µA	- 30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 24		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			6		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = - 250 µA	- 1.0		- 2.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 25 V			± 150	µA
		V_{DS} = 0 V, V_{GS} = ± 20 V			± 15	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 30 V, V_{GS} = 0 V			- 1	
		V_{DS} = - 30 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ - 5 V, V_{GS} = - 10 V	- 20			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 13 A		0.0080		Ω
		V_{GS} = - 6 V, I_D = - 10 A		0.0090		
		V_{GS} = - 4.5 V, I_D = - 8 A		0.0120		
Forward Transconductance[a]	g_{fs}	V_{DS} = - 15 V, I_D = - 13 A		44		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = - 15 V, V_{GS} = 0 V, f = 1 MHz		4620		pF
Output Capacitance	C_{oss}			880		
Reverse Transfer Capacitance	C_{rss}			820		
Total Gate Charge	Q_g	V_{DS} = - 15 V, V_{GS} = - 10 V, I_D = - 17.3 A		102	153	nC
				66	80	
Gate-Source Charge	Q_{gs}	V_{DS} = - 15 V, V_{GS} = - 5 V, I_D = - 17.3 A		16		
Gate-Drain Charge	Q_{gd}			28		
Gate Resistance	R_g	f = 1 MHz	0.3	1.3	2.6	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 0 V, R_L = 1.5 Ω $I_D \cong$ - 10 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		70	105	ns
Rise Time	t_r			70	105	
Turn-Off Delay Time	$t_{d(off)}$			45	68	
Fall Time	t_f			27	41	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 1.5 Ω $I_D \cong$ - 10 A, V_{GEN} = - 10 V, R_g = 1 Ω		18	30	
Rise Time	t_r			15	25	
Turn-Off Delay Time	$t_{d(off)}$			52	80	
Fall Time	t_f			14	25	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 5.8	A
Pulse Diode Forward Current	I_{SM}				- 60	
Body Diode Voltage	V_{SD}	I_S = - 10 A, V_{GS} = 0 V		- 0.78	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 10 A, dI/dt = 100 A/µs, T_J = 25 °C		35	53	ns
Body Diode Reverse Recovery Charge	Q_{rr}			25	38	nC
Reverse Recovery Fall Time	t_a			19		ns
Reverse Recovery Rise Time	t_b			16		

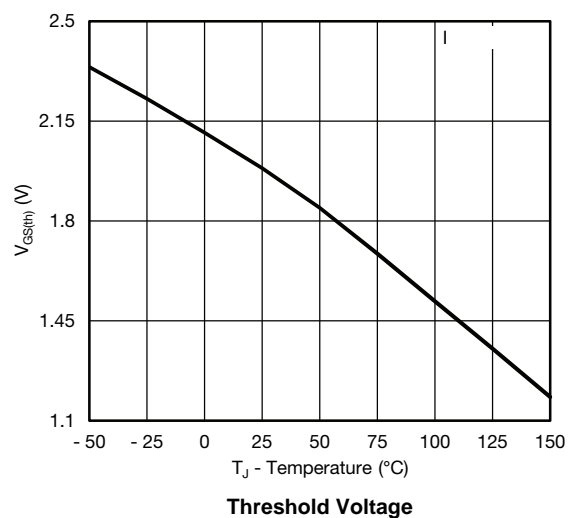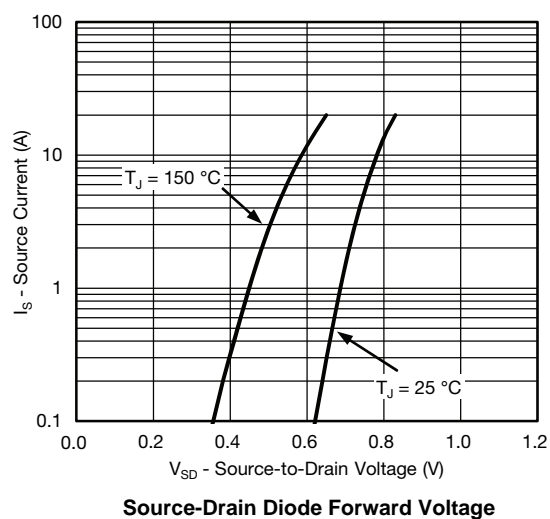Notes:
a. Pulse test; pulse width $\leq$ 300 µs, duty cycle $\leq$ 2 %
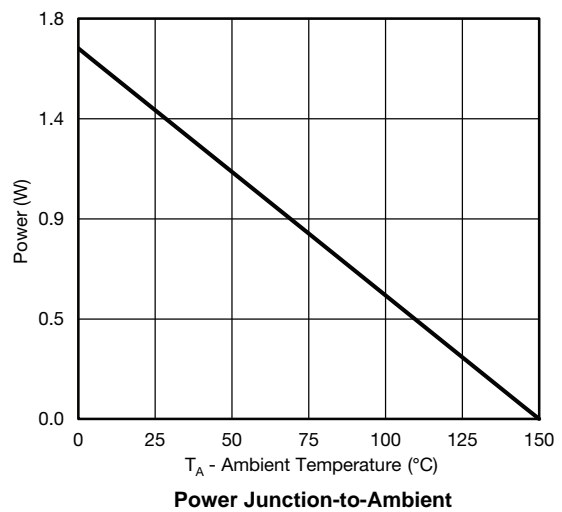b. Guaranteed by design, not subject to production testing.
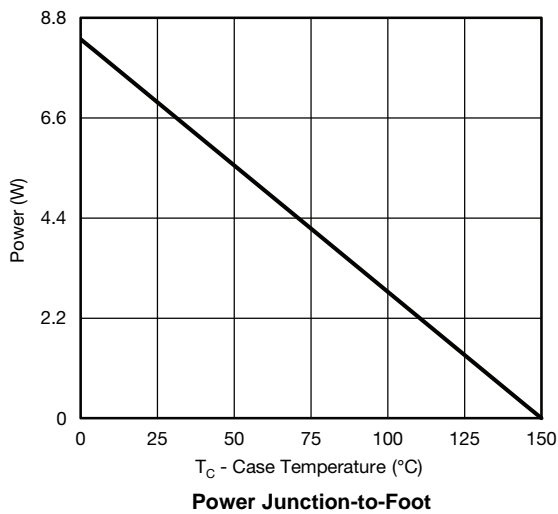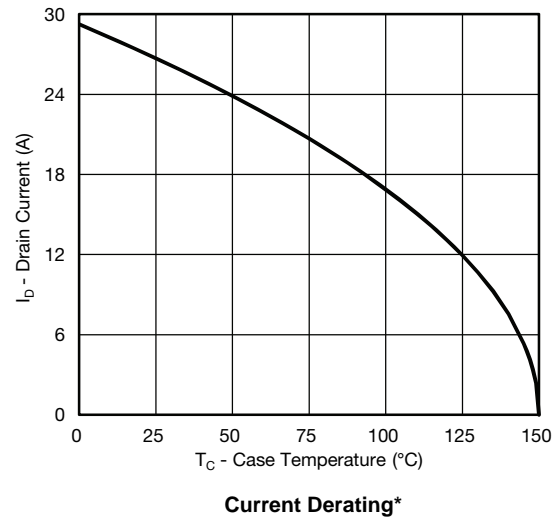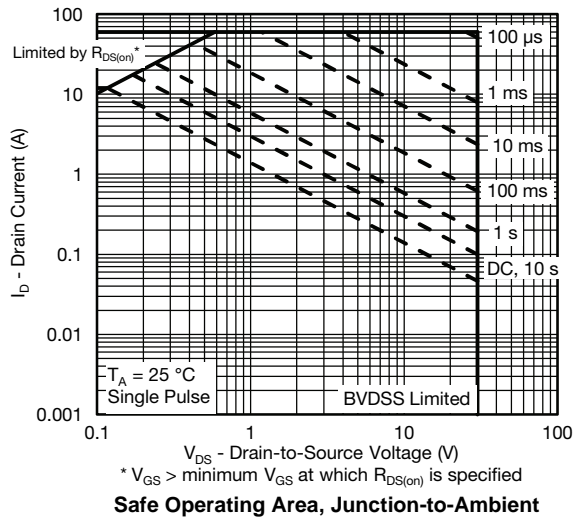
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

I_D = 17.3 A

V_{DS} = 15 V

V_{DS} = 7.5 V

V_{DS} = 24 V

V_{GS} - Gate-to-Source Voltage (V)

Q_g - Total Gate Charge (nC)

Gate Charge

On-Resistan

T_J = 150 °C

T_J = 25 °C

I_S - Source Current (A)

V_{SD} - Source-to-Drain Voltage (V)

Source-Drain Diode Forward Voltage

$V_{GS(th)}$ (V)

T_J - Temperature (°C)

Threshold Voltage

4

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Safe Operating Area, Junction-to-Ambient

Limited by $R_{DS(on)}$*

I_D - Drain Current (A)

100 µs
1 ms
10 ms
100 ms
1 s
DC, 10 s

T_A = 25 °C
Single Pulse

BVDSS Limited

V_{DS} - Drain-to-Source Voltage (V)
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

I_D - Drain Current (A)

T_C - Case Temperature (°C)

Current Derating*

Power (W)

T_C - Case Temperature (°C)

Power Junction-to-Foot

Power (W)

T_A - Ambient Temperature (°C)

Power Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max.)}$ = 150 °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.

PowerPAK SO-8, (SINGLE/DUAL)

Backside View of Single Pad

Backside View of Dual Pad

Notes
1. Inch will govern.
2 Dimensions exclusive of mold gate burrs.
3. Dimensions exclusive of mold flash and cutting burrs.
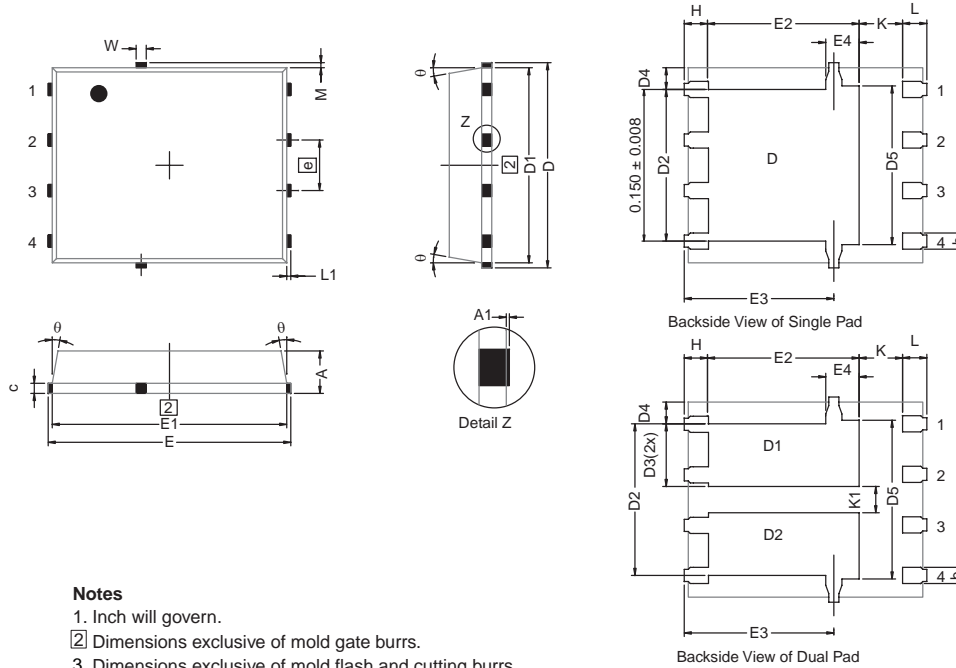
DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.97	1.04	1.12	0.038	0.041	0.044
A1	0.00	-	0.05	0.000	-	0.002
b	0.33	0.41	0.51	0.013	0.016	0.020
c	0.23	0.28	0.33	0.009	0.011	0.013
D	5.05	5.15	5.26	0.199	0.203	0.207
D1	4.80	4.90	5.00	0.189	0.193	0.197
D2	3.56	3.76	3.91	0.140	0.148	0.154
D3	1.32	1.50	1.68	0.052	0.059	0.066
D4	0.57 TYP.			0.0225 TYP.		
D5	3.98 TYP.			0.157 TYP.		
E	6.05	6.15	6.25	0.238	0.242	0.246
E1	5.79	5.89	5.99	0.228	0.232	0.236
E2	3.48	3.66	3.84	0.137	0.144	0.151
E3	3.68	3.78	3.91	0.145	0.149	0.154
E4	0.75 TYP.			0.030 TYP.		
e	1.27 BSC			0.050 BSC		
K	1.27 TYP.			0.050 TYP.		
K1	0.56	-	-	0.022	-	-
H	0.51	0.61	0.71	0.020	0.024	0.028
L	0.51	0.61	0.71	0.020	0.024	0.028
L1	0.06	0.13	0.20	0.002	0.005	0.008
θ	0°	-	12°	0°	-	12°
W	0.15	0.25	0.36	0.006	0.010	0.014
M	0.125 TYP.			0.005 TYP.		

ECN: T10-0055-Rev. J, 15-Feb-10
DWG: 5881

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