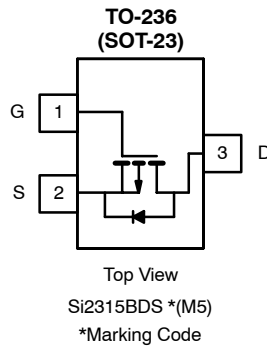


# SI2315BDS

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-12	0.050 @ $V_{GS} = -4.5$ V	-3.85
	0.065 @ $V_{GS} = -2.5$ V	-3.4
	0.100 @ $V_{GS} = -1.8$ V	-2.7



Ordering Information: SI2315BDS-T1

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	5 sec	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	-12		V	
Gate-Source Voltage	$V_{GS}$	$\pm 8$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$T_A = 25^\circ\text{C}$	$I_D$	-3.85	-3.0	A
	$T_A = 70^\circ\text{C}$		-3.0	-2.45	
Pulsed Drain Current <sup>a</sup>		$I_{DM}$	-12		
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	-1.0	-0.62	
Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	$P_D$	1.19	0.75	W
	$T_A = 70^\circ\text{C}$		0.76	0.48	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 5$ sec.	$R_{thJA}$	85	105	$^\circ\text{C/W}$
	Steady State		130	166	
Maximum Junction-to-Foot (Drain)	Steady State	$R_{thJF}$	60	75	

Notes

- a. Surface Mounted on FR4 Board.
- b.  $t \leq 5$  sec.



# SI2315BDS

SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -10 μA	-12			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-0.45		-0.90	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -12 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -12 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C			-10	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -4.5 V	-6			A
		V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -2.5 V	-3			
Drain-Source On-Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -3.85 A		0.040	0.050	Ω
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -3.4 A		0.050	0.065	
		V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -2.7 A		0.071	0.100	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -5 V, I <sub>D</sub> = -3.85 A		7		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = -1.6 A, V <sub>GS</sub> = 0 V			-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -6 V, V <sub>GS</sub> = -4.5 V I <sub>D</sub> ≅ -3.85 A		8	15	nC
Gate-Source Charge	Q <sub>gs</sub>			1.1		
Gate-Drain Charge	Q <sub>gd</sub>			2.3		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -6 V, V <sub>GS</sub> = 0, f = 1 MHz		715		pF
Output Capacitance	C <sub>oss</sub>			275		
Reverse Transfer Capacitance	C <sub>rss</sub>			200		
<b>Switching<sup>b</sup></b>						
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -6 V, R <sub>L</sub> = 6 Ω I <sub>D</sub> ≅ -1.0 A, V <sub>GEN</sub> = -4.5 V R <sub>G</sub> = 6 Ω		15	20	ns
	t <sub>r</sub>			35	50	
Turn-Off Time	t <sub>d(off)</sub>			50	70	
	t <sub>f</sub>			50	75	

Notes

- a. For DESIGN AID ONLY, not subject to production testing.
- b. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
- c. Switching time is essentially independent of operating temperature.