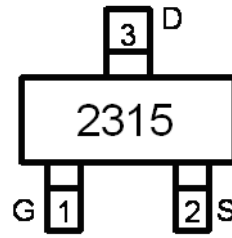


Main Product Characteristics

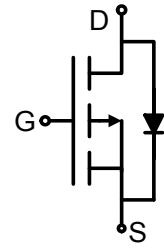
V_{DSS}	-20V
$R_{DS(on)}$	114m Ω (typ.)
I_D	-3A



SOT-23



Marking and pin Assignment



Schematic diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature



Description

The SSF2315 utilizes the latest processing techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. These features make this device extremely efficient and reliable for use in power switching applications and a wide variety of other applications.

Absolute Max Ratings

Symbol	Parameter	Max.	Units
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	-3	A
$I_D @ T_C = 70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	-2.4	
I_{DM}	Pulsed Drain Current②	-15	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation③	1.4	W
	Linear Derating Factor	0.011	W/°C
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-to-Source Voltage	± 12	V
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	°C

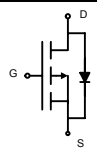
Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10\text{s}$) ④	80	100	°C/W

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

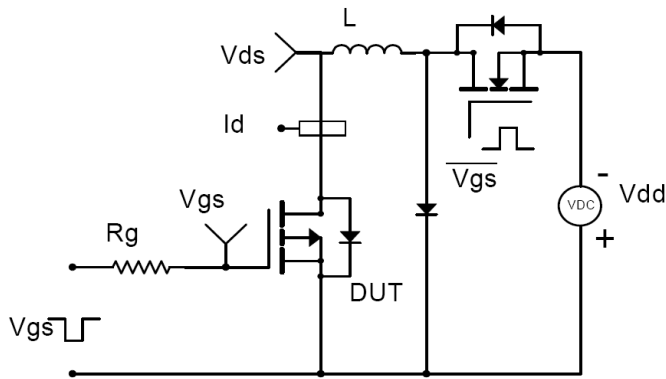
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-20	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$R_{DS(on)}$	Static Drain-to-Source On-resistance	—	114	158	m Ω	$V_{GS}=-4.5V, I_D = -3A$
		—	158	202		$V_{GS}=-2.5V, I_D = -2A$
$V_{GS(th)}$	Gate Threshold Voltage	-0.5	—	-1.0	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	-1	μA	$V_{DS} = -20V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 12V$
		—	—	-100		$V_{GS} = -12V$
Q_g	Total Gate Charge	—	8.5	—	nC	$I_D = -3A,$ $V_{DS} = -10V,$ $V_{GS} = -4.5V$
Q_{gs}	Gate-to-Source Charge	—	1.2	—		
Q_{gd}	Gate-to-Drain("Miller") Charge	—	2.1	—		
$t_{d(on)}$	Turn-on Delay Time	—	7.2	—	ns	$V_{GS}=-4.5V, V_{DS}=-10V,$ $I_D=-3A, R_{GEN}=3\Omega$
t_r	Rise Time	—	36	—		
$t_{d(off)}$	Turn-Off Delay Time	—	53	—		
t_f	Fall Time	—	56	—		
C_{iss}	Input Capacitance	—	560	—	pF	$V_{GS} = 0V$ $V_{DS} = -10V$ $f = 1MHz$
C_{oss}	Output Capacitance	—	80	—		
C_{rss}	Reverse Transfer Capacitance	—	70	—		

Source-Drain Ratings and Characteristics

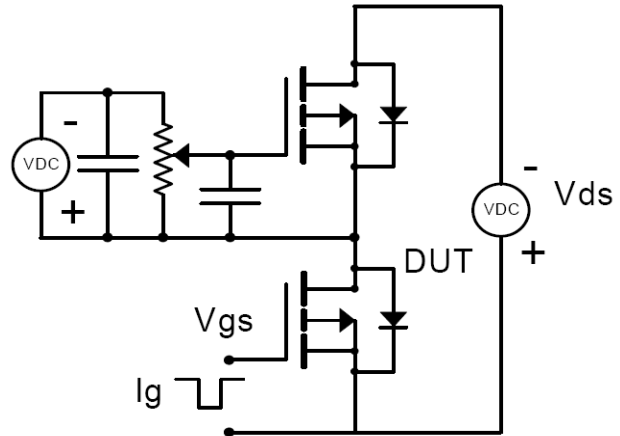
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-3	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-15	A	
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	$I_S=-1A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	—	37	—	ns	$T_J = 25^\circ\text{C}, I_F = -4A,$
Q_{rr}	Reverse Recovery Charge	—	27	—	nC	$di/dt = 100A/\mu s$

Test Circuits and Waveforms

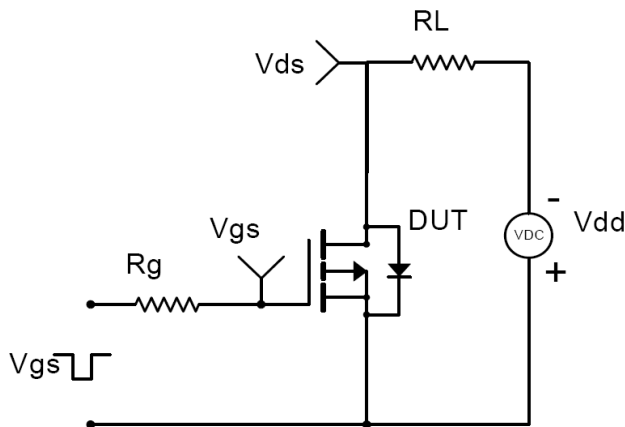
E_{AS} Test Circuit:



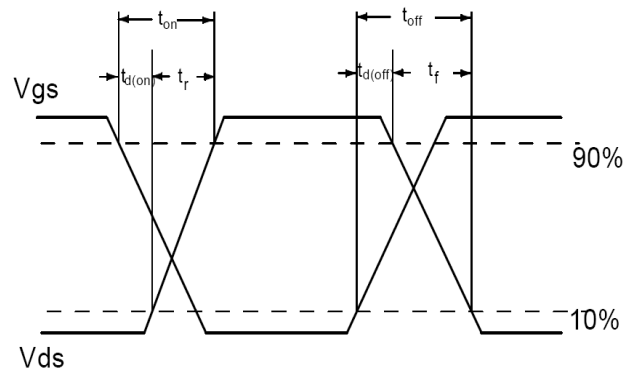
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching Waveforms:



Notes:

- ① The maximum current rating is limited by bond-wires.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation P_D is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C

Typical Electrical and Thermal Characteristics

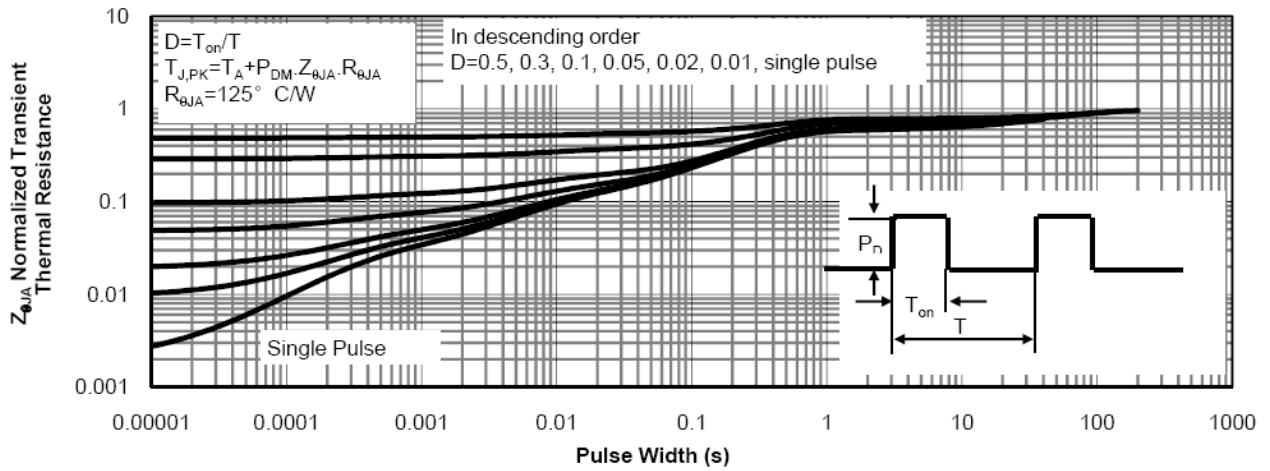
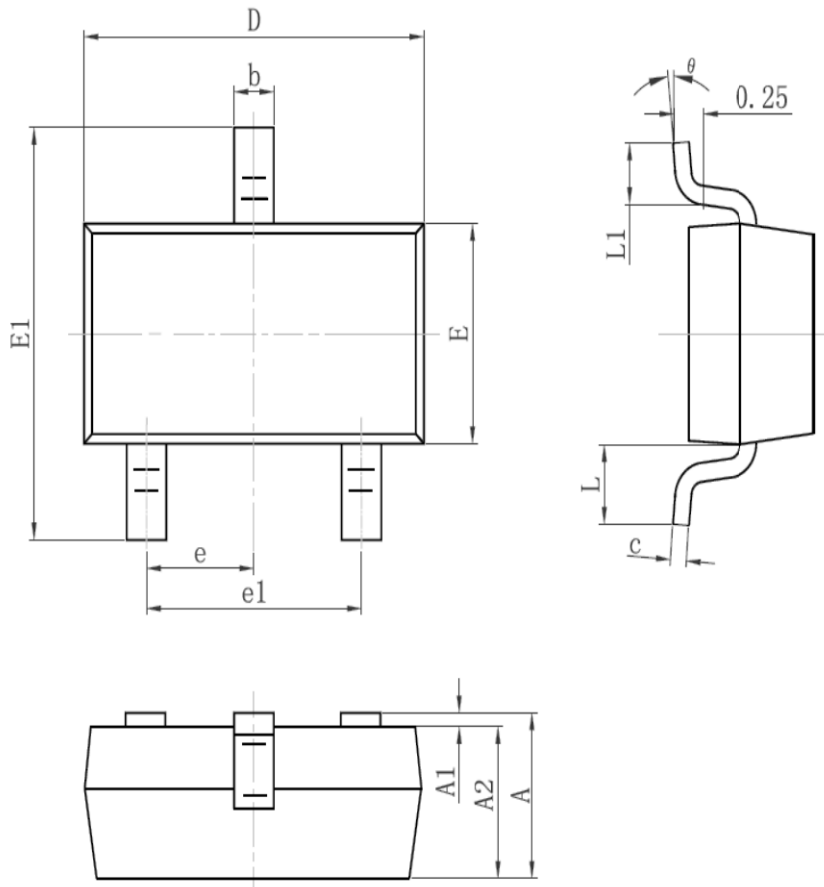


Figure 1. Normalized Maximum Transient Thermal Impedance

Mechanical Data

SOT-23 PACKAGE OUTLINE DIMENSION



Symbol	Dimension In Millimeters		Dimension In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.95TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.55REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Ordering and Marking Information

<p>Device Marking: 2315</p> <p>Package (Available) SOT-23</p> <p>Operating Temperature Range C: -55 to 150°C</p>

Devices per Unit

Package Type	Units/ Tube	Tubes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
SOT-23	3000	10	30000	4	120000

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	T _j =125°C to 150°C @ 80% of Max V _{DSS} /V _{CES} /V _R	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	T _j =150°C @ 100% of Max V _{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices