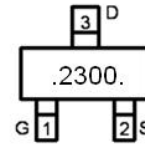
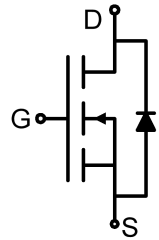


Main Product Characteristics:

V_{DSS}	20V
$R_{DS(on)}$	44mΩ(typ.)
I_D	3A


SOT-23

**Marking and Pin
Assignments**

Schematic Diagram
Features and Benefits

- Advanced MOSFET process technology
- Special designed 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:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

Symbol	Parameter	Max.	Units
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V$ ①	3	A
I_{DM}	Pulsed Drain Current②	11	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation③	1.35	W
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

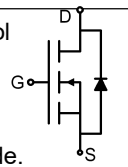
Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ^④	—	140	°C/W

Electrical Characterizes @ $T_A=25^{\circ}\text{C}$ 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	—	44	55	m Ω	$V_{GS}=4.5V, I_D = 2A$
		—	52	80	m Ω	$V_{GS}=2.5V, I_D = 1A$
$V_{GS(th)}$	Gate threshold voltage	0.4	—	1	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	—	10	—	nC	$I_D = 4.2A,$ $V_{DS}=10V,$ $V_{GS} = 4.5V$
Q_{gs}	Gate-to-Source charge	—	2.3	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	2.9	—		
$t_{d(on)}$	Turn-on delay time	—	3.6	—	ns	$V_{GS}=4.5V, V_{DD}=20V,$ $R_{GEN}=3\Omega$ $R_L=10\Omega$
t_r	Rise time	—	10.6	—		
$t_{d(off)}$	Turn-Off delay time	—	7.2	—		
t_f	Fall time	—	4	—		
C_{iss}	Input capacitance	—	133	—	pF	$V_{GS} = 0V$ $V_{DS} = 20V$ $f = 1MHz$
C_{oss}	Output capacitance	—	24	—		
C_{rss}	Reverse transfer capacitance	—	17	—		

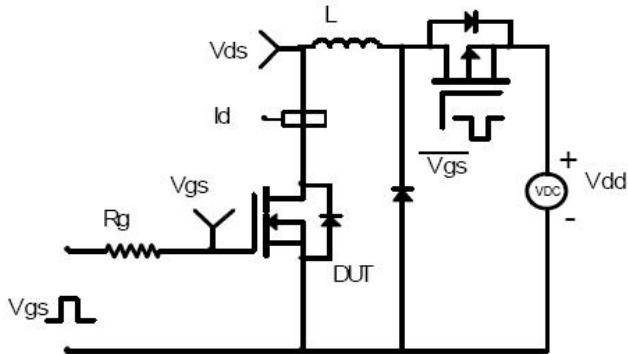
Source-Drain Ratings and Characteristics

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)	—	—	11	A	
V_{SD}	Diode Forward Voltage	—	0.75	1.2	V	$I_S=1A, V_{GS}=0V$

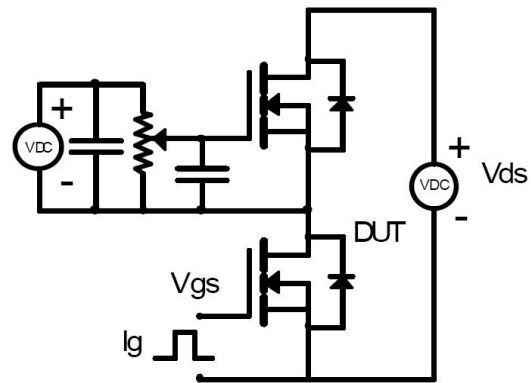


Test Circuits and Waveforms

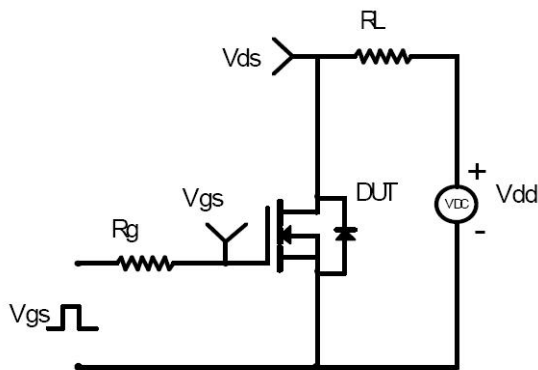
EAS Test Circuit:



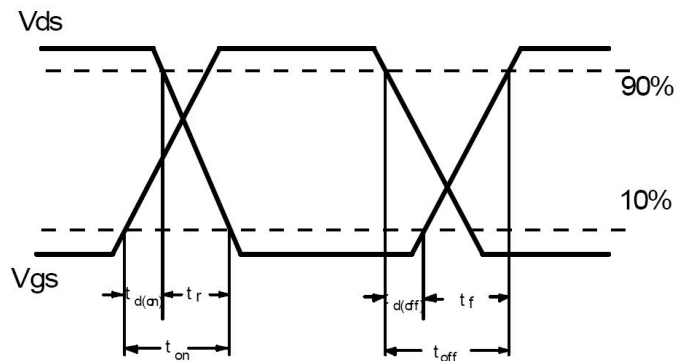
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching Waveforms:



Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ \text{C}$

Typical Electrical and Thermal Characteristics

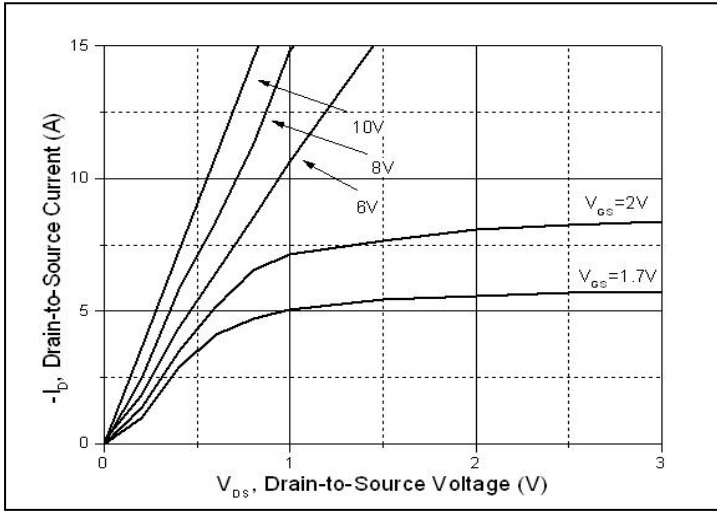


Figure1. Typical Output Characteristics

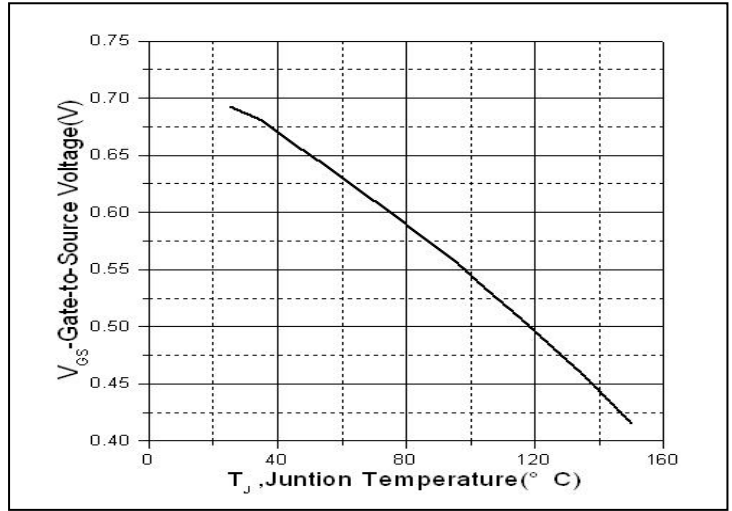


Figure2. Vth vs. Junction Temperature

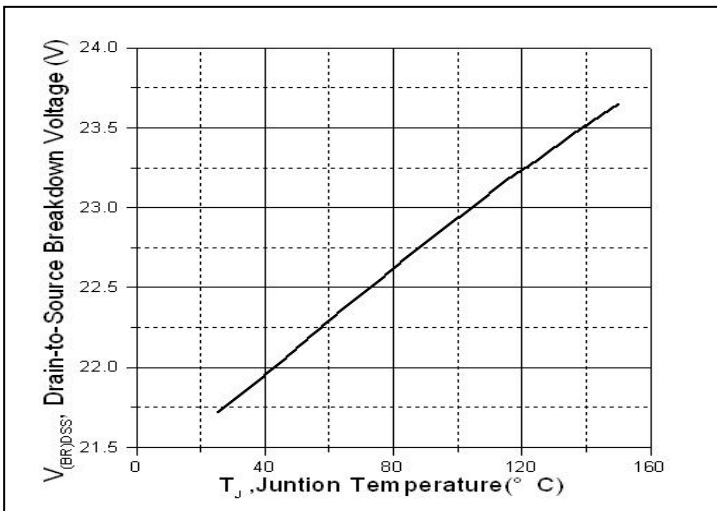


Figure3. Drain-to-Source Breakdown Voltage vs. Junction Temperature

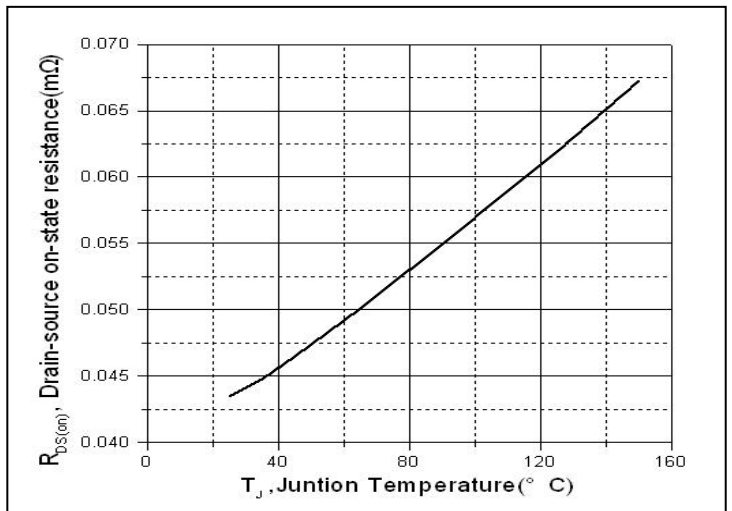


Figure4. R_DS(on) vs. Junction Temperature

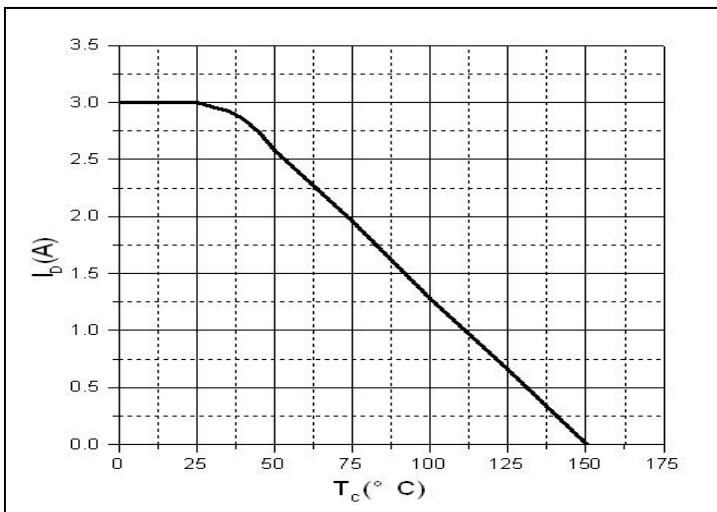


Figure5. Drain Current vs. Case Temperature

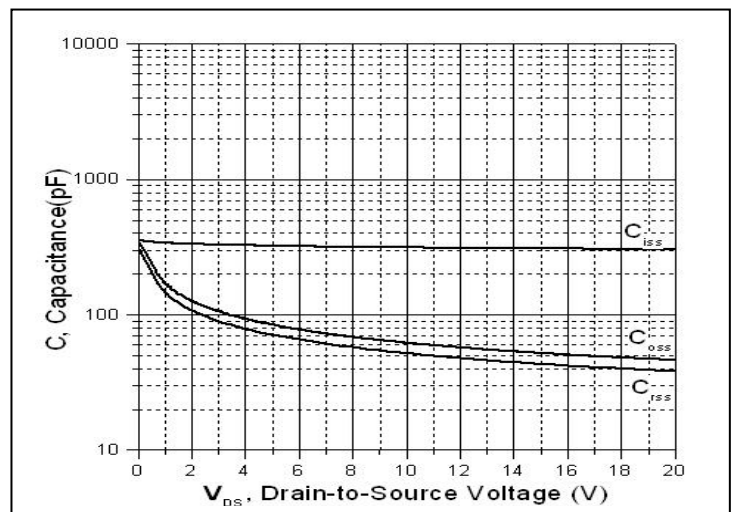
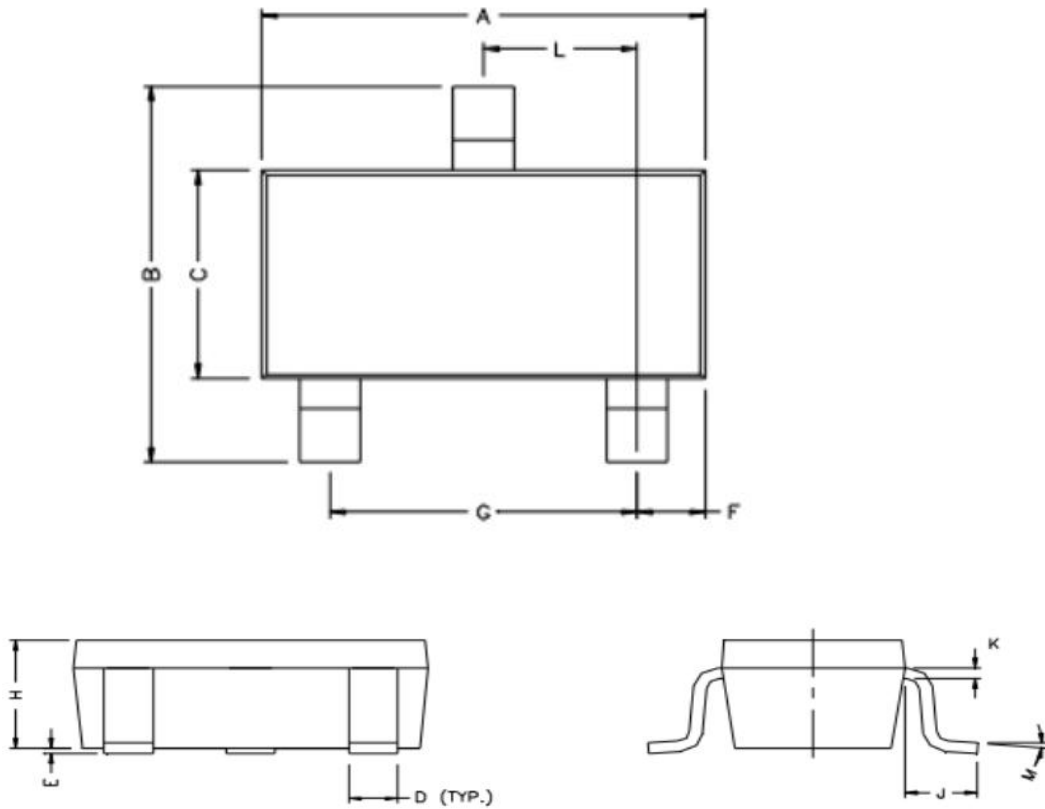


Figure6. Capacitance

Mechanical Data:

SOT-23 Package Outline(Unit:mm)



REF.	Millimeter		REF.	Millimete	
	Min.	Max.		Min.	Max.
A	2.80	3.00	G	1.80	2.00
B	2.30	2.50	H	0.90	1.1
C	1.20	1.40	K	0.10	0.20
D	0.30	0.50	J	0.35	0.70
E	0	0.10	L	0.92	0.98
F	0.45	0.55	M	0°	10°

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