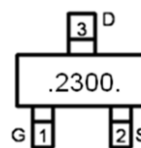
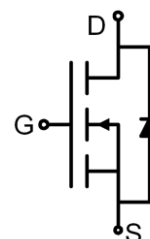


Main Product Characteristics:

V_{DSS}	20V
$R_{DS(on)}$	44m Ω (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, $V_{GS} @ 10\text{V}$ 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	$^\circ\text{C}$

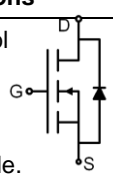
Thermal Resistance

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

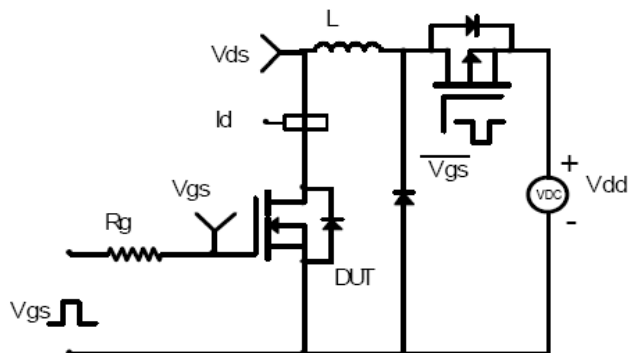
Electrical Characterizes @ $T_A=25^{\circ}\text{C}$ unless otherwise specified

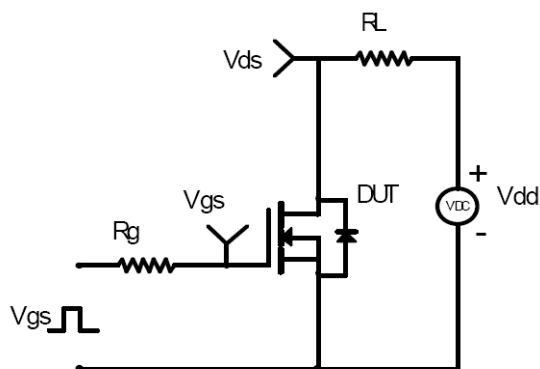
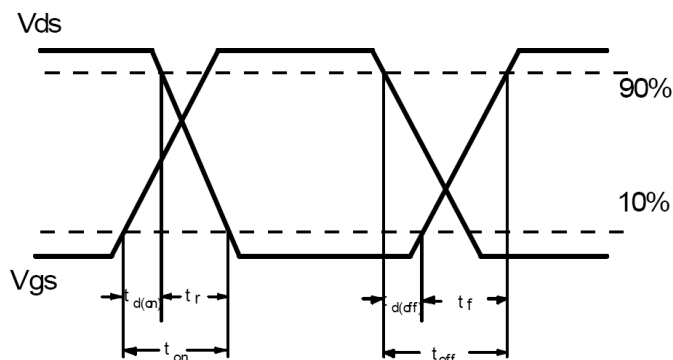
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	20	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	44	55	$\text{m}\Omega$	$V_{GS}=4.5\text{V}, I_D = 2\text{A}$
		—	52	80	$\text{m}\Omega$	$V_{GS}=2.5\text{V}, I_D = 1\text{A}$
$V_{GS(th)}$	Gate threshold voltage	0.4	—	1	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 12\text{V}$
		—	—	-100		$V_{GS} = -12\text{V}$
Q_g	Total gate charge	—	10	—	nC	$I_D = 4.2\text{A},$ $V_{DS}=10\text{V},$ $V_{GS} = 4.5\text{V}$
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	$V_{GS}=4.5\text{V}, V_{DD}=20\text{V},$ $R_{GEN}=3\Omega$ $R_L=10\Omega$
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	$V_{GS} = 0\text{V}$ $V_{DS} = 20\text{V}$ $f = 1\text{MHz}$
C_{oss}	Output capacitance	—	24	—		
C_{riss}	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	$I_S=1\text{A}, V_{GS}=0\text{V}$

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 $T_A = 25\text{ }^\circ\text{C}$

Typical Electrical and Thermal Characteristics

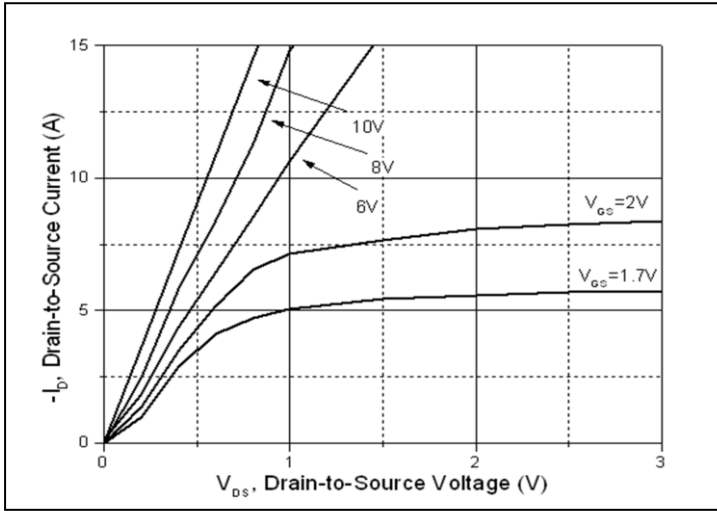


Figure1. Typical Output Characteristics

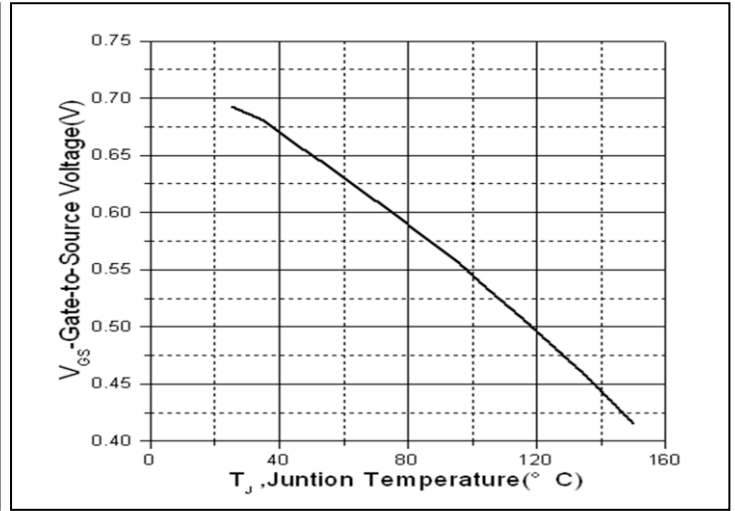


Figure2. V_{th} vs. Junction Temperature

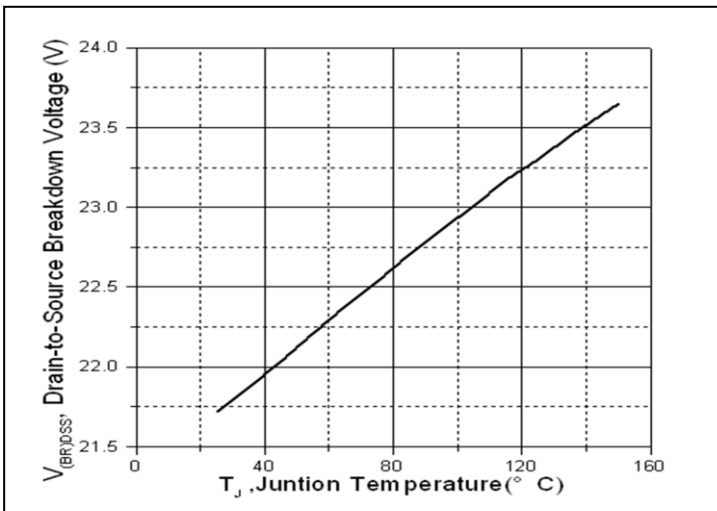


Figure3. Drain-to-Source Breakdown Voltage vs. Junction Temperature

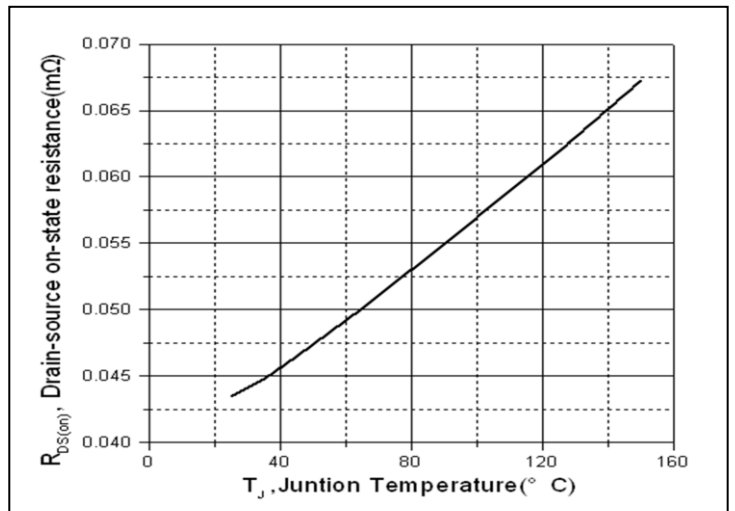


Figure4. $R_{DS(on)}$ vs. Junction Temperature

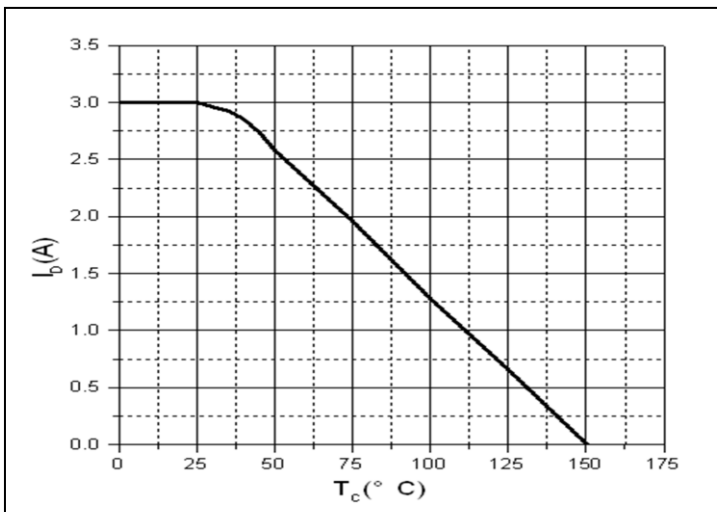


Figure5. Drain Current vs. Case Temperature

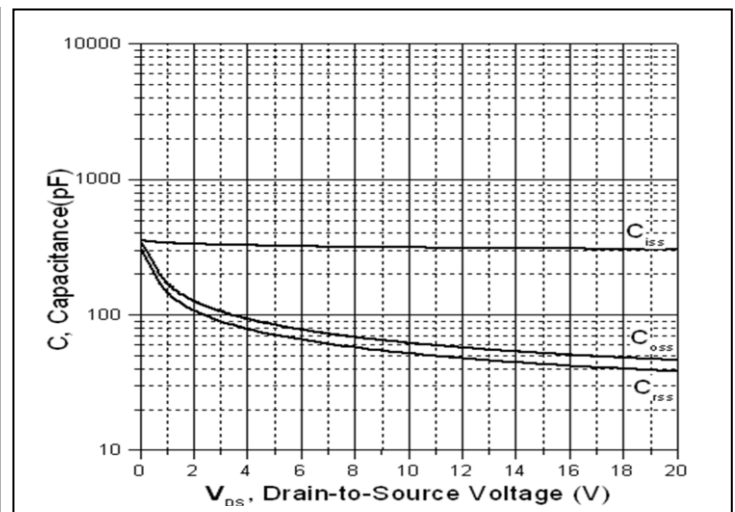
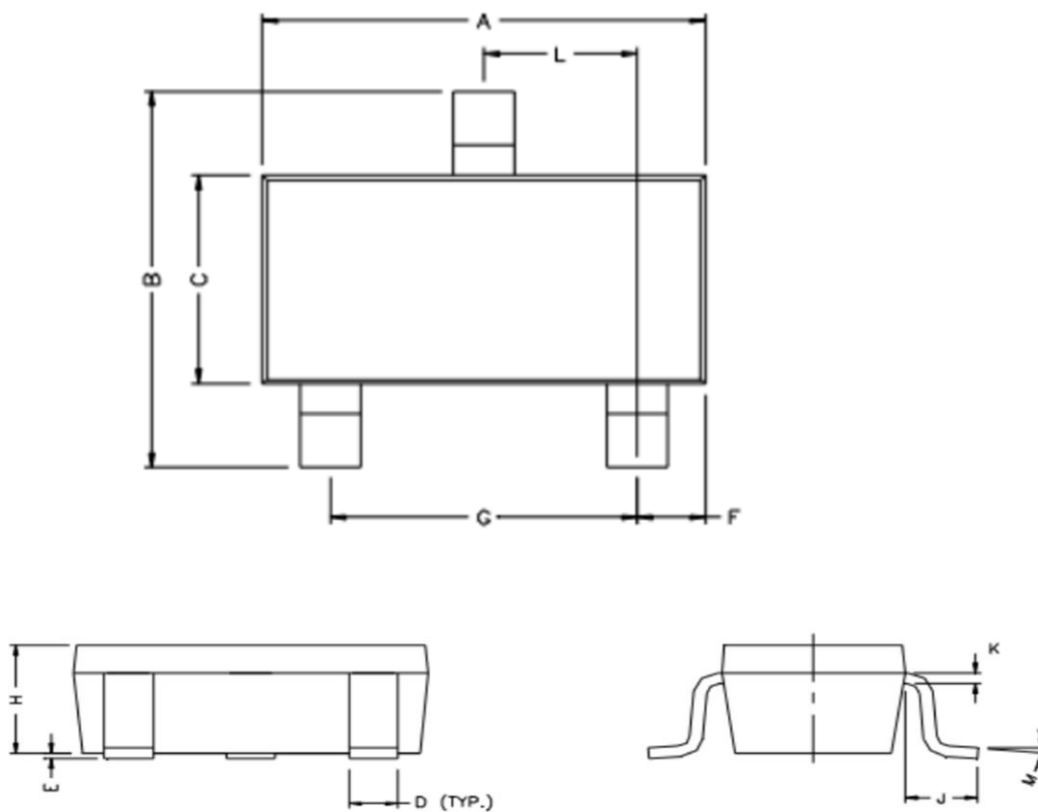


Figure6. Capacitance

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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