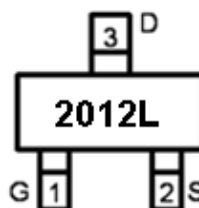
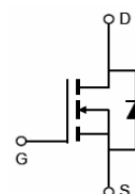


Main Product Characteristics:

V_{DSS}	20V
$R_{DS(on)}$	10.5m Ω (typ.)
I_D	6A ①


SOT23-3

Marking and pin Assignment

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

Symbol	Parameter	Max.	Units
I_D @ $T_C = 25^{\circ}\text{C}$	Continuous Drain Current, V_{GS} @ 10V ①	6	A
I_D @ $T_C = 70^{\circ}\text{C}$	Continuous Drain Current, V_{GS} @ 10V ①	4.5	
I_{DM}	Pulsed Drain Current ②	24	
P_D @ $T_C = 25^{\circ}\text{C}$	Power Dissipation ③	1.25	W
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-to-Source Voltage	± 12	V
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	$^{\circ}\text{C}$

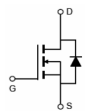
Thermal Resistance

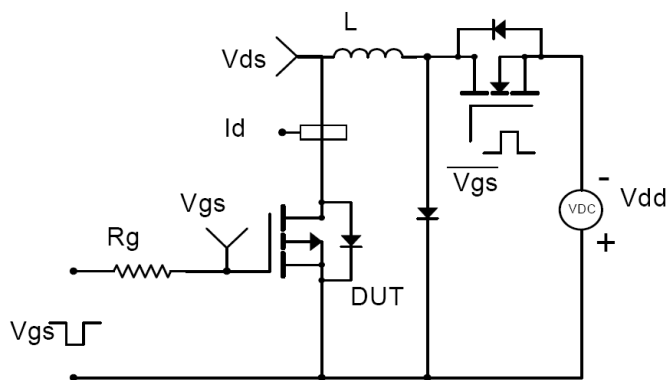
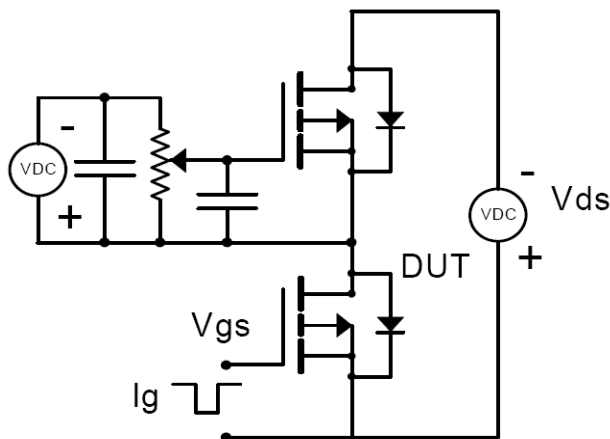
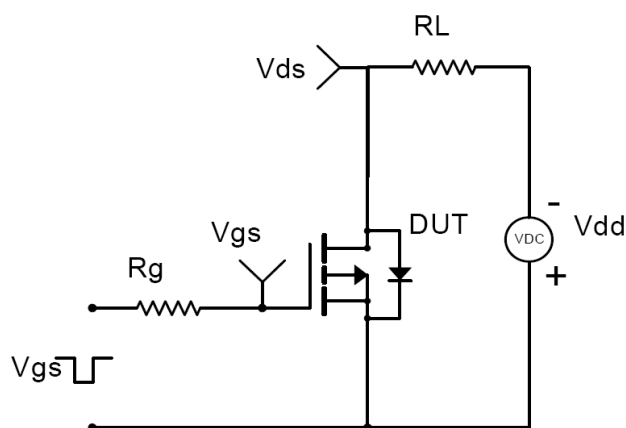
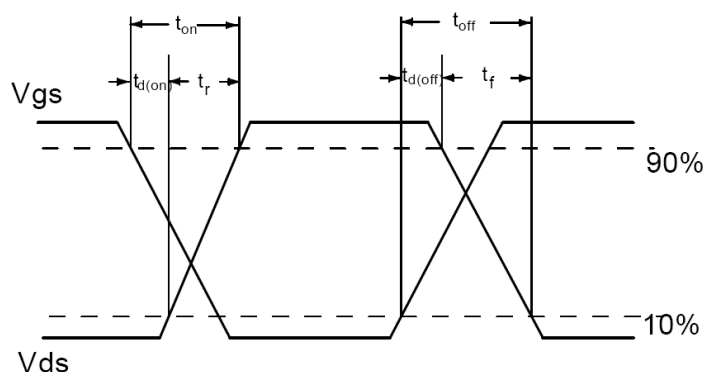
Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10s$) ④	—	100	$^{\circ}C /W$

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

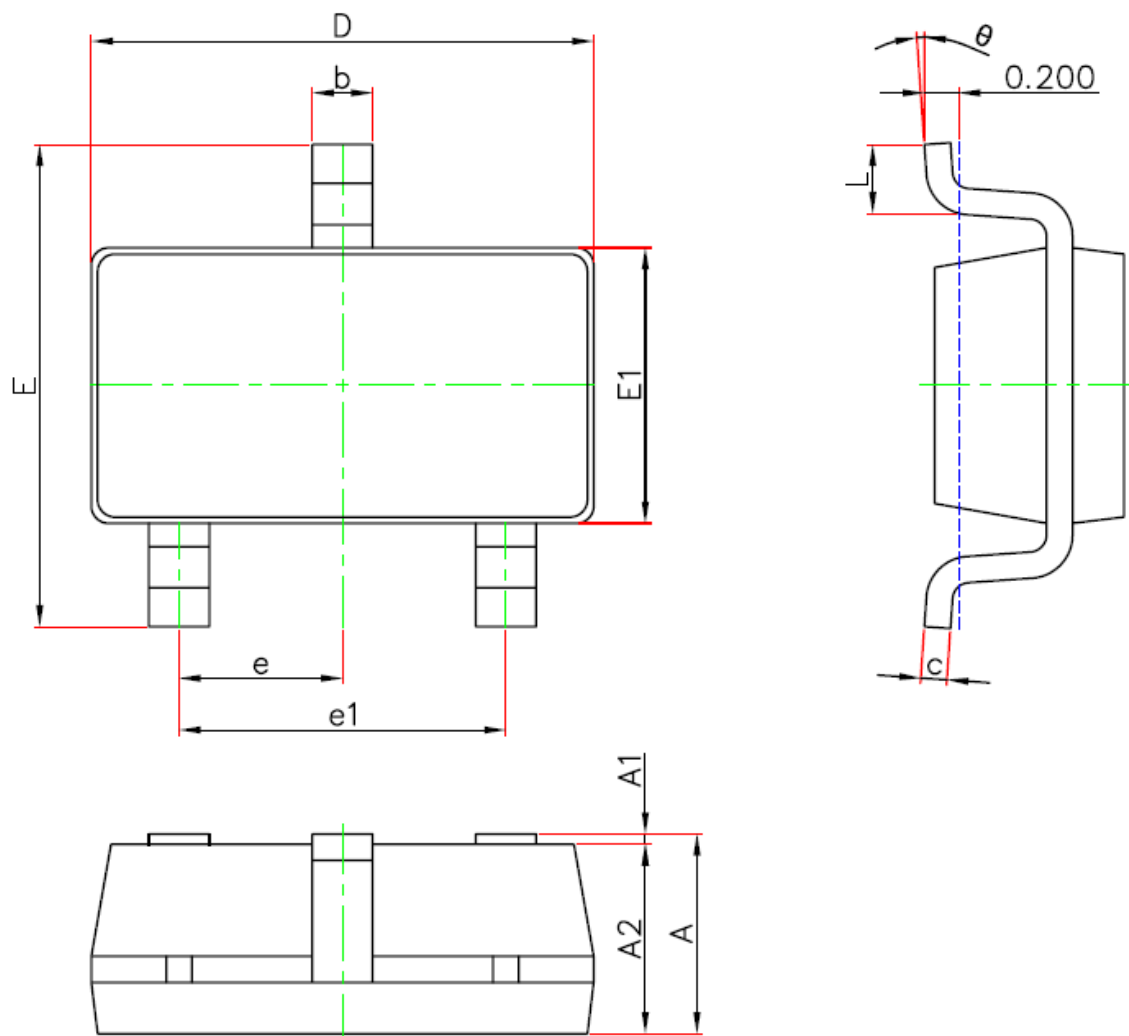
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	20	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	10.5	13	m Ω	$V_{GS}=4.5V, I_D = 20A$
$V_{GS(th)}$	Gate threshold voltage	0.5	—	1.2	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
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	—	12	—	nC	$I_D = 6A,$ $V_{DS}=16V,$ $V_{GS} = 4.5V$
Q_{gs}	Gate-to-Source charge	—	1.8	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	3.2	—		
$t_{d(on)}$	Turn-on delay time	—	10	—	ns	$V_{GS}=4.5V, V_{DS} = 10V,$ $R_{GEN}=6\Omega, I_D = 6A$
t_r	Rise time	—	20	—		
$t_{d(off)}$	Turn-Off delay time	—	35	—		
t_f	Fall time	—	15	—		
C_{iss}	Input capacitance	—	600	—	pF	$V_{GS} = 0V,$ $V_{DS} = 10V,$ $f = 1MHz$
C_{oss}	Output capacitance	—	150	—		
C_{rss}	Reverse transfer capacitance	—	100	—		

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	6	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	24	A	
V_{SD}	Diode Forward Voltage	—	—	1.2	V	

Test circuits and Waveforms
EAS test circuit:

Gate charge test circuit:

Switching time test circuit:

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

Mechanical Data:


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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