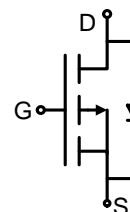


**Main Product Characteristics:**

$V_{DSS}$	-30V
$R_{DS(on)}$	46m $\Omega$ (typ.)
$I_D$	-4.2A ①


**SOT-23**

**Schematic Diagram**
**Features and Benefits:**

- Advanced trench 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 trench 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
$I_D$ @ TC = 25°C	Continuous Drain Current, $V_{GS}$ @ 10V ①	-4.2	A
$I_{DM}$	Pulsed Drain Current ②	-30	
$P_D$ @TC = 25°C	Power Dissipation	1.4	W
$V_{DS}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 12$	V
$T_J$ $T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 150	°C

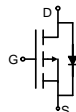
## Thermal Resistance

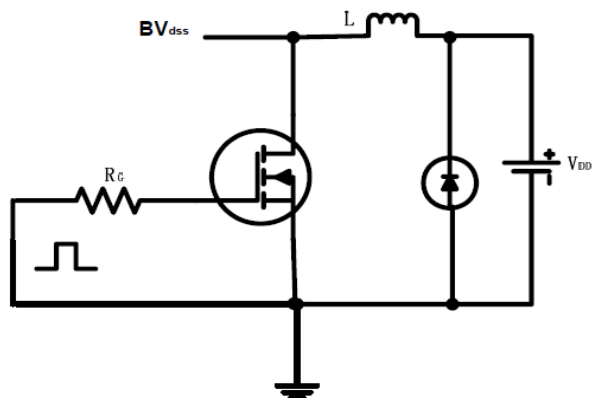
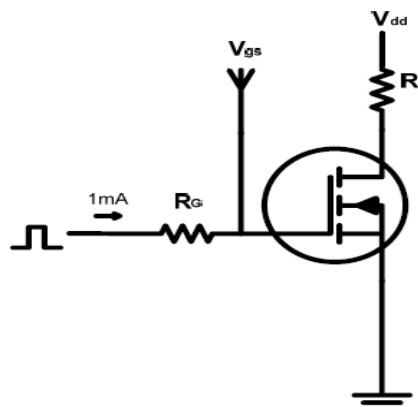
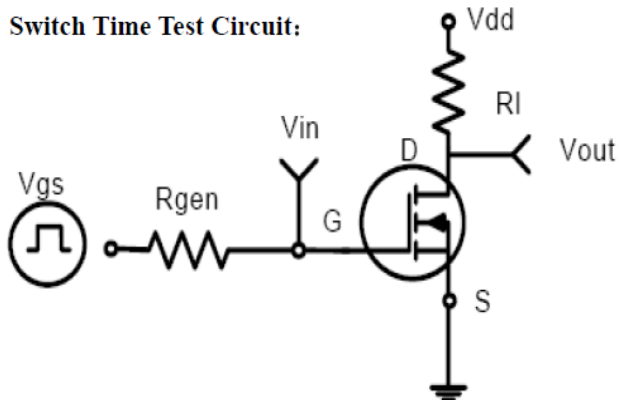
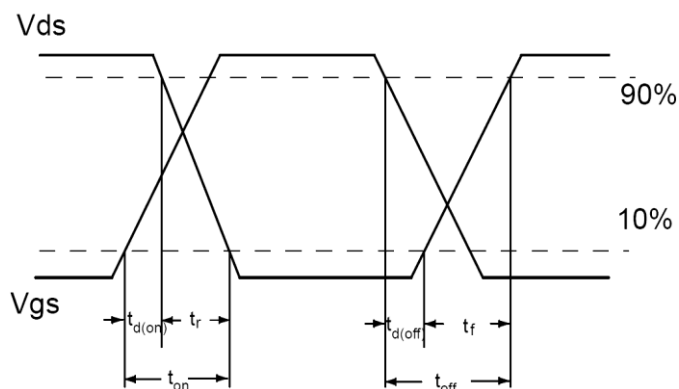
Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-ambient ( $t \leq 10s$ ) ③	—	125	$^{\circ}C/W$

## 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	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	46	64	m $\Omega$	$V_{GS} = -10V, I_D = -4.2A$
		—	51.5	75		$V_{GS} = -4.5V, I_D = -4A$
		—	67.3	120		$V_{GS} = -2.5V, I_D = -1A$
$V_{GS(th)}$	Gate threshold voltage	-0.5	—	-1.3	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
$I_{DSS}$	Drain-to-Source leakage current	—	—	-1	$\mu A$	$V_{DS} = -24V, V_{GS} = 0V$
$I_{GSS}$	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 12V$
		—	—	-100		$V_{GS} = -12V$
$Q_g$	Total gate charge	—	10	—	nC	$I_D = -4A,$ $V_{DS} = -15V,$ $V_{GS} = -10V$
$Q_{gs}$	Gate-to-Source charge	—	2	—		
$Q_{gd}$	Gate-to-Drain("Miller") charge	—	3	—		
$t_{d(on)}$	Turn-on delay time	—	6.5	—	ns	$V_{GS} = -10V, V_{DS} = -15V,$ $R_{GEN} = 6\Omega, R_L = 3.7\Omega$
$t_r$	Rise time	—	3.5	—		
$t_{d(off)}$	Turn-Off delay time	—	38	—		
$t_f$	Fall time	—	12	—		
$C_{iss}$	Input capacitance	—	809	—	pF	$V_{GS} = 0V,$ $V_{DS} = -25V,$ $f = 1MHz$
$C_{oss}$	Output capacitance	—	50	—		
$C_{riss}$	Reverse transfer capacitance	—	48	—		

## Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode) ①	—	—	-2.2	A	MOSFET symbol showing the integral reverse p-n junction diode. 
$V_{SD}$	Diode Forward Voltage	—	-0.81	-1.2	V	$I_S = -1A, V_{GS} = 0V$

**Test circuits and Waveforms**
**EAS test circuits:**

**Gate charge test circuit:**

**Switch 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 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

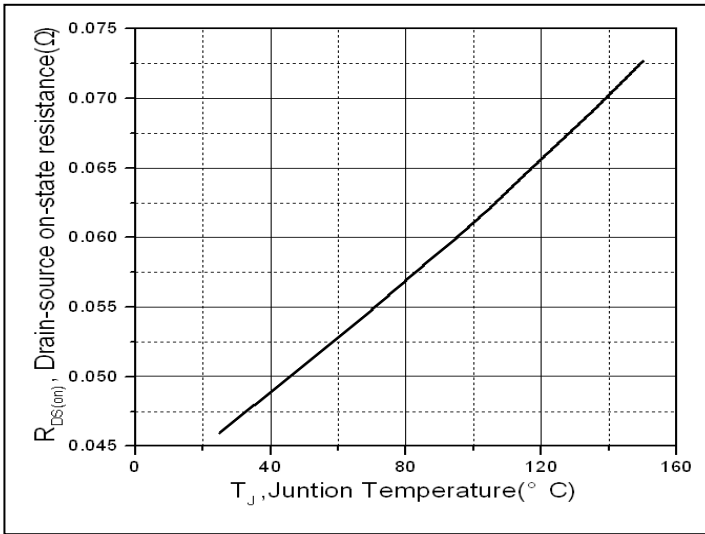


Figure 1. Normalized On-Resistance Vs. Case Temperature

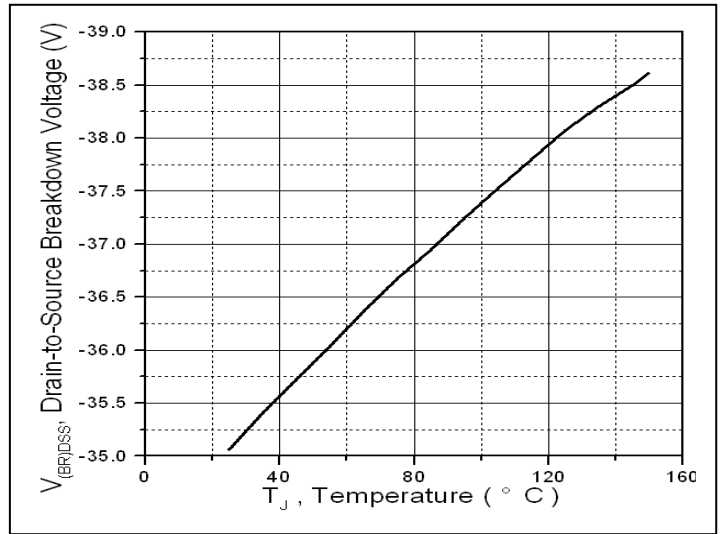


Figure 2. Drain-to-Source Breakdown Voltage vs. Temperature

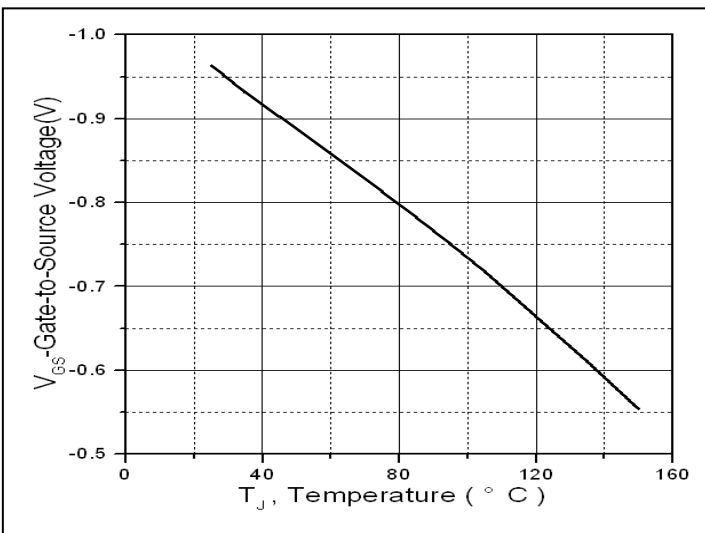


Figure 3. Gate to source cut-off voltage

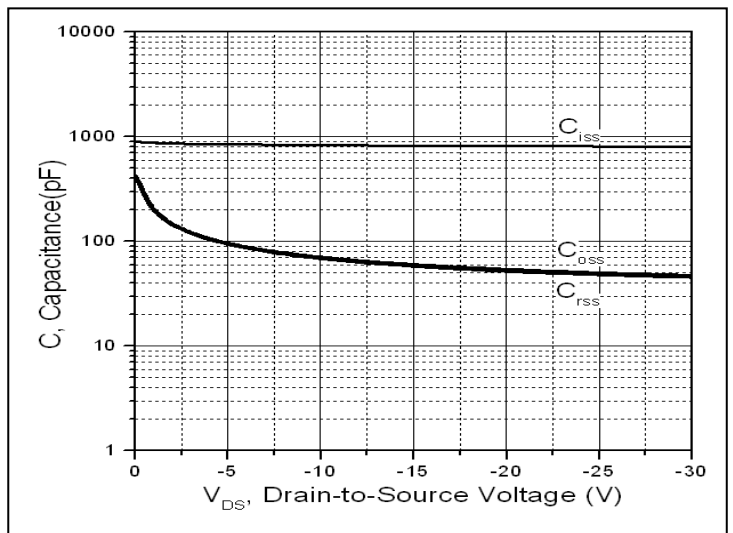
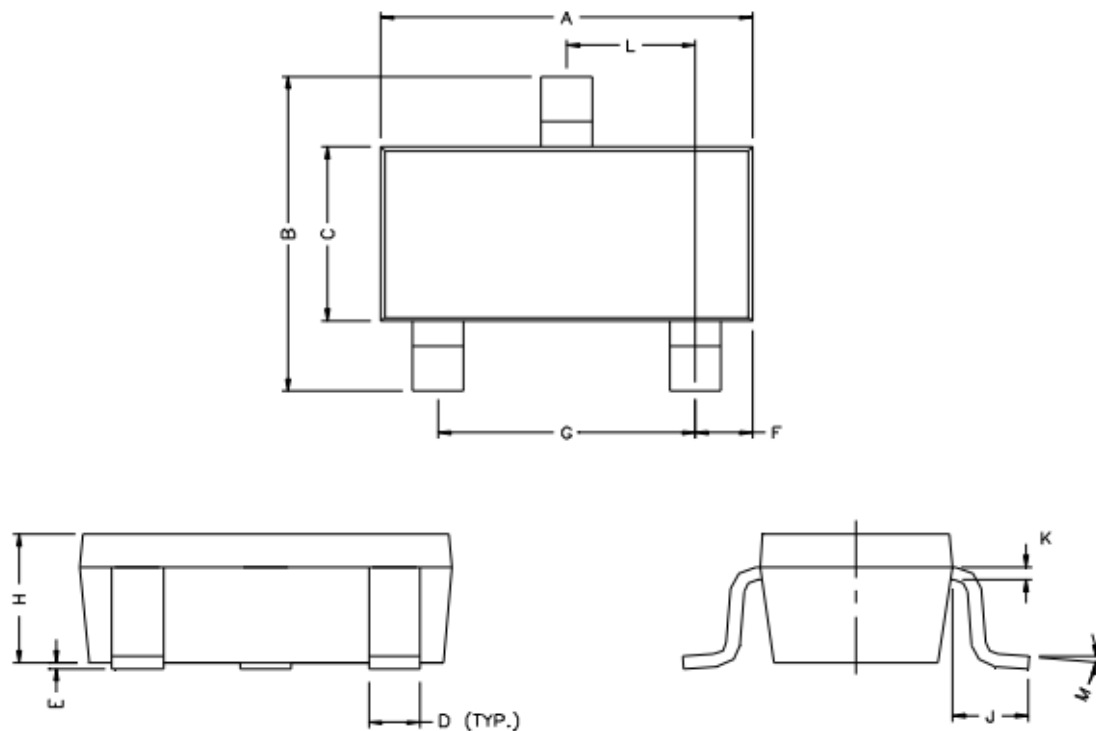


Figure 4. Typical Capacitance Vs. Drain-to-Source Voltage

**Mechanical Data:**


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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