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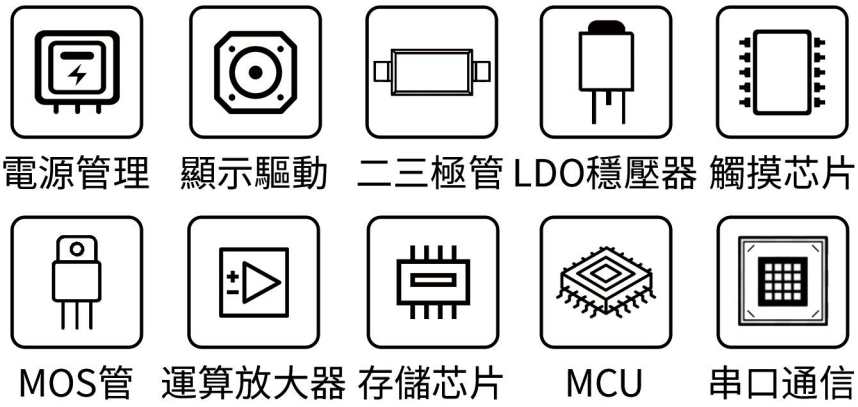
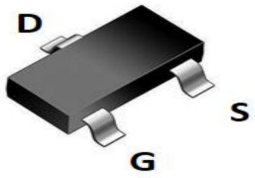


2309-TD

產品規格說明書

General Description

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge



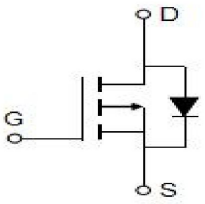
SOT-23

Features

- -60V, -3 A

  $R_{DS(ON)}$ Typ = 144 mΩ @ V_{GS} = -10V

  $R_{DS(ON)}$ Typ = 157 mΩ @ V_{GS} = -4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free



Schematic Diagram

Applications

- Load Switch
- PWM Application
- Power Management

Absolute Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		-60	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A = 25°C	-3	A
		T_A = 100°C	-1.8	
I_{DM}	Pulsed Drain Current [1]			A
P_D	Power Dissipation	T_A = 25°C	-12	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient[2]		1.56	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		80	°C
			-55 to 150	

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = -250μA, V_{GS} = 0V	-60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -60V, V_{GS} = 0V	-	-	-1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1.1	-1.5	-2.4	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = -10V, I_D = -3 A	-	144	150	mΩ
		V_{GS} = -4.5V, I_D = -2A	-	157	165	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = -25V, f = 1MHz	-	716	-	pF
C_{oss}	Output Capacitance		-	30	-	pF
C_{rss}	Reverse Transfer Capacitance		-	21	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to -10V V_{DS} =-30V, I_D = -2A	-	4.92	-	nC
Q_{gs}	Gate Source Charge		-	0.97	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	0.72	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = -10V, V_{DD} = -30V I_D= -2A , R_{GEN} = 5Ω	-	6.8	-	ns
t_r	Turn-On Rise Time		-	8	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	16	-	ns
t_f	Turn-Off Fall Time		-	4	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-3	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-12	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -3A	-	-	-1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit

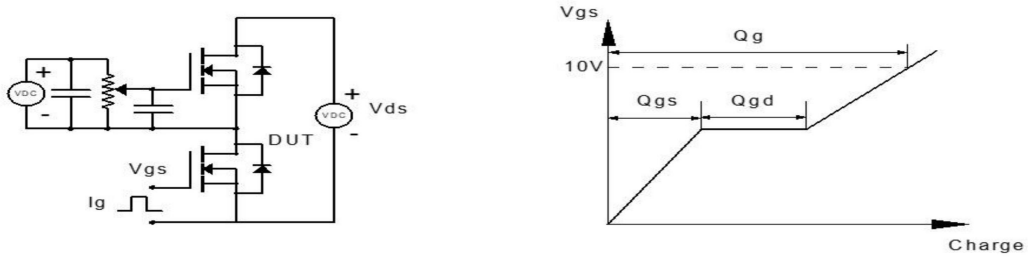


Figure 1: Gate Charge Test Circuit & Waveform

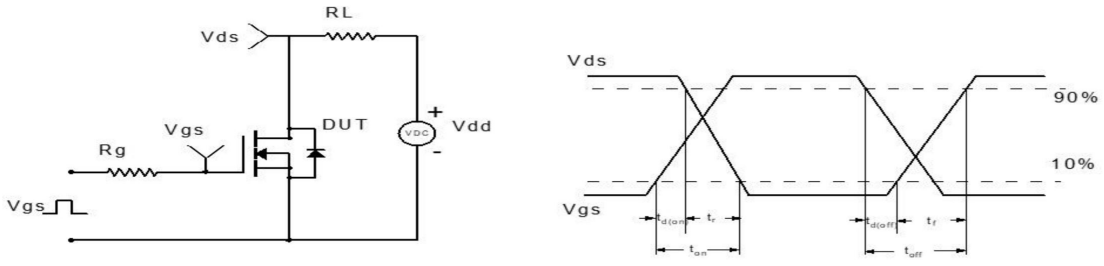


Figure 2: Resistive Switching Test Circuit & Waveform

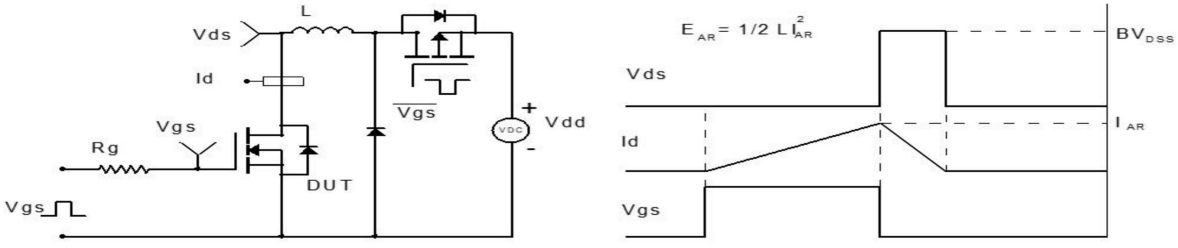


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

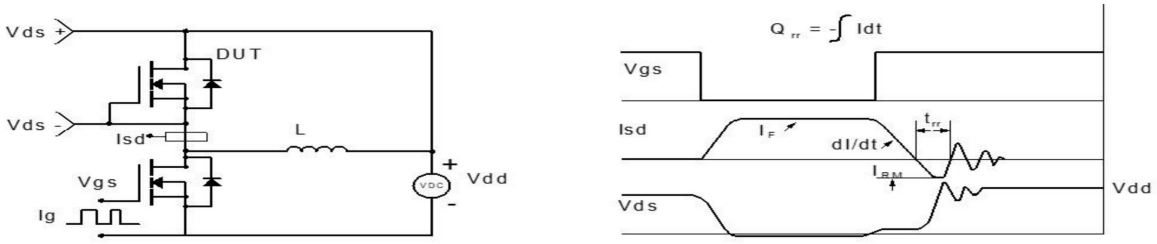


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(SOT-23)