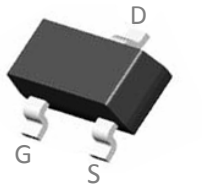
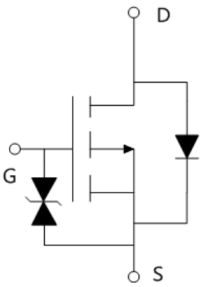
Description：

This P-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.





Features：

1) V_{DS}=-20V,I_D=-0.5A,$R_{DS(ON)}$<420mΩ @V_{GS}=-4.5V（Typ：320mΩ）
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.
6) ESD Protection
7) MSL3

Package Marking and Ordering Information：

Part NO.	Marking	Package	Packing
DOY3139A	3139A	SOT-523	3000 pcs/Reel

Absolute Maximum Ratings：（T_A=25℃ unless otherwise noted）

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±10	V
I_D	Continuous Drain Current-T_A=25℃	-0.5	A
	Continuous Drain Current-T_A=70℃	-0.3	
I_{DM}	Pulsed Drain Current[1]	-2	
P_D	Power Dissipation	0.15	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	833	℃/W

Electrical Characteristics: (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=-250μA	-20	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=-20V	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±10V, V_{DS}=0A	---	---	±10	μA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=-250μA	-0.4	-0.65	-1	V
$R_{DS(ON)}$	Drain-Source On Resistance[3]	V_{GS}=-4.5V,I_D=-0.5A	---	320	420	mΩ
		V_{GS}=-2.5V,I_D=-0.4A	---	430	560	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-10V, V_{GS}=0V, f=1MHz	---	65.3	---	pF
C_{oss}	Output Capacitance		---	14	---	
C_{rss}	Reverse Transfer Capacitance		---	8	---	
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=-10V, I_D=-0.5A, R_{ENG}=3Ω,V_{GS}=-4.5V	---	4	---	ns
t_r	Rise Time		---	19	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	16.08	---	ns
t_f	Fall Time		---	25.1	---	ns
Q_g	Total Gate Charge	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-0.5A	---	1.14	---	nC
Q_{gs}	Gate-Source Charge		---	0.37	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	0.25	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_{SD}=-0.5A	---	---	-1.2	V
I_S	Continuous Drain Curren	V_D=V_G=0V	---	---	-0.5	A
I_{SM}	Pulsed Drain Current		---	---	-2	A

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : TJ=25℃,VDD=50V,VG=10V,L=0.5mH
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Test Circuit

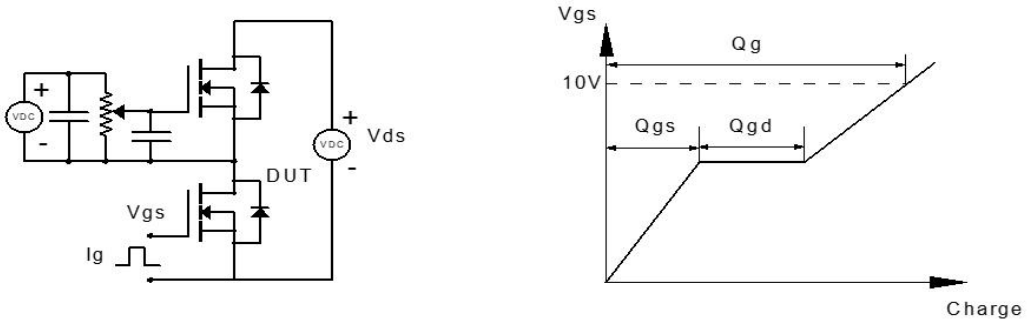


Figure 1: Gate Charge Test Circuit & Waveform

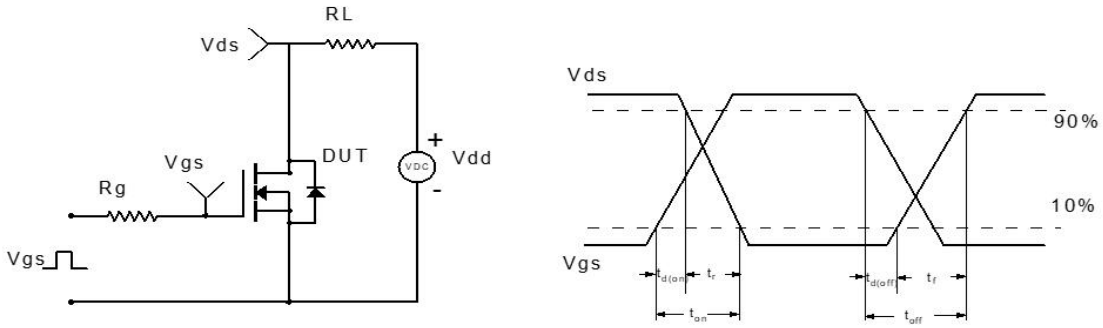


Figure 2: Resistive Switching Test Circuit & Waveform

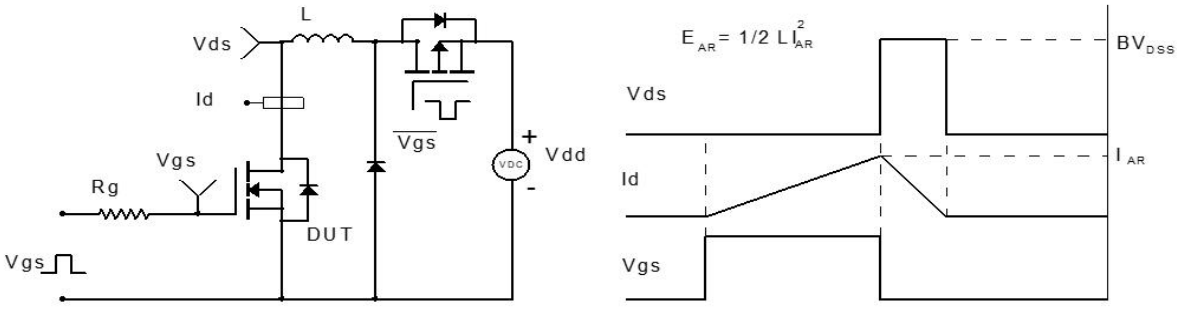


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

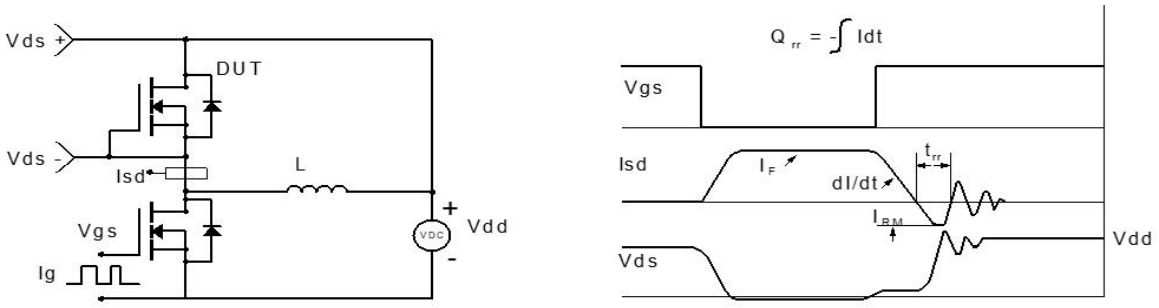
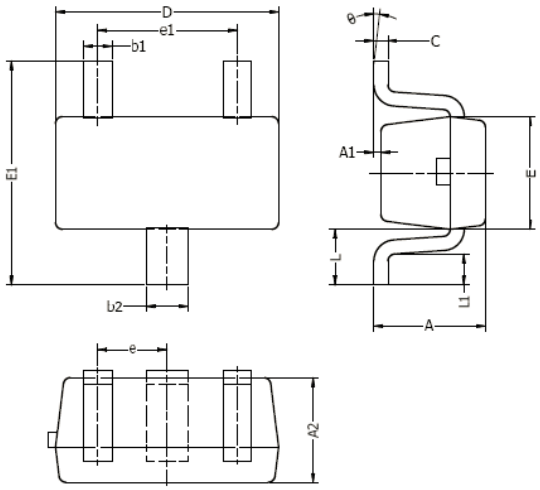


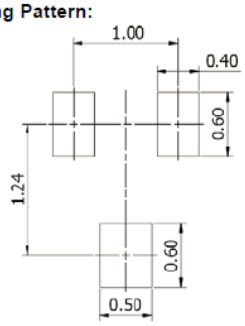
Figure 4: Diode Recovery Test Circuit & Waveform

SOT523 Package Outline Data

Unit:mm



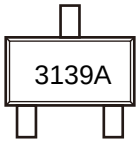
Typical Soldering Pattern:



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.70	0.90	0.028	0.035
A1	0.00	0.10	0.000	0.004
A2	0.70	0.80	0.028	0.031
b1	0.15	0.25	0.006	0.010
b2	0.25	0.35	0.010	0.014
c	0.10	0.20	0.004	0.008
D	1.50	1.70	0.059	0.067
E	0.70	0.90	0.028	0.035
E1	1.45	1.75	0.057	0.069
e	0.50 TYP.		0.020 TYP.	
e1	0.90	1.10	0.035	0.043
L	0.40 REF.		0.016 REF.	
L1	0.10	0.30	0.004	0.012
θ	0°	8°	0°	8°

NOTES:
1. Above package outline conforms to JEITA EAIJ ED-7500A SC-75A.
2. Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.

Marking Information：



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2024-09-06	Release of final version

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