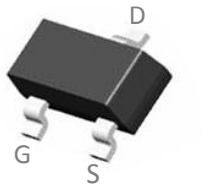
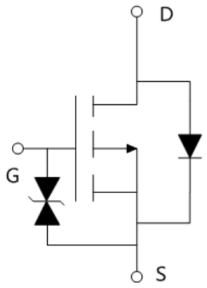
Description：

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=-0.6A,$R_{DS(ON)}$<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
DOX3139A	3139A	SOT- 323	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℃[1]	-0.6	A
	Continuous Drain Current-T_A=100℃[1]	-0.42	
I_{DM}	Pulsed Drain Current[2]	-2.4	
P_D	Power Dissipation	0.28	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	450	℃/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	-0.6	-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	---	ns
t_f	Fall Time		---	26	---	ns
Q_g	Total Gate Charge	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-0.5A	---	1.1	---	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 Current	V_D=V_G=0V	---	---	-0.5	A
I_{SM}	Pulsed Drain Current		---	---	-2	A
Trr	Reverse Recovery Time	I_F=-0.5A,T_J=25℃ dI/dt=100A/u	---	0.97	---	ns
Qrr	Reverse Recovery Charge		---	26	---	nC

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

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

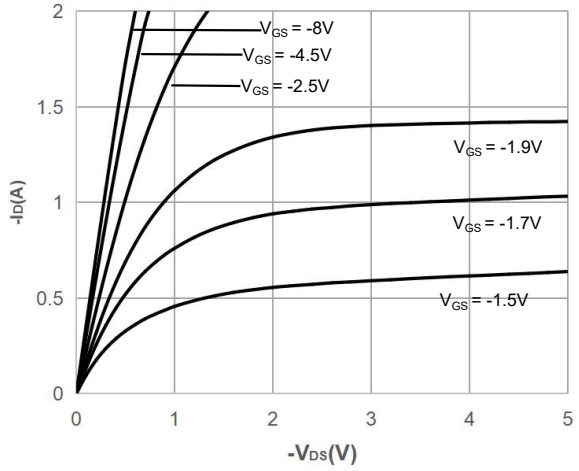


Figure 1: Output Characteristics

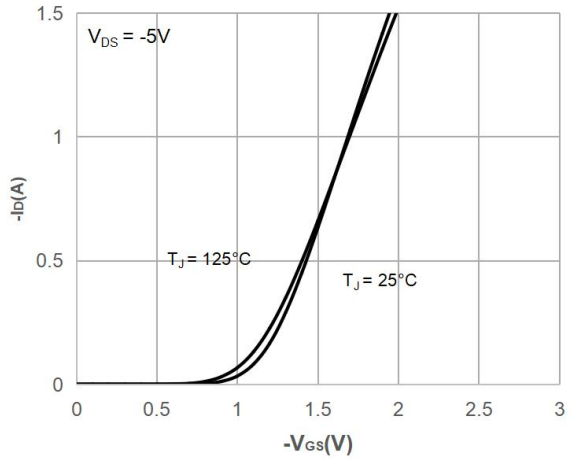


Figure 2: Typical Transfer Characteristics

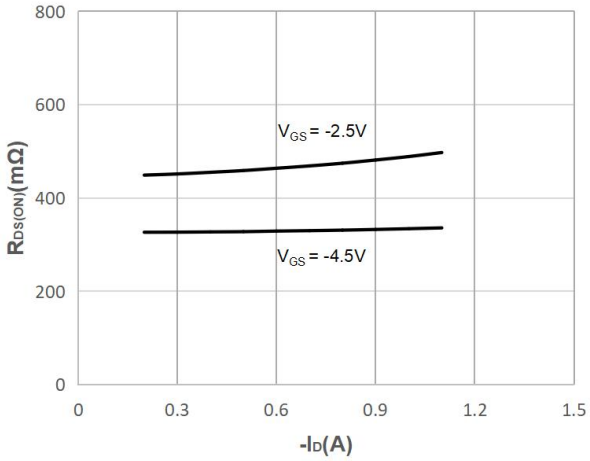


Figure 3: On-resistance vs. Drain Current

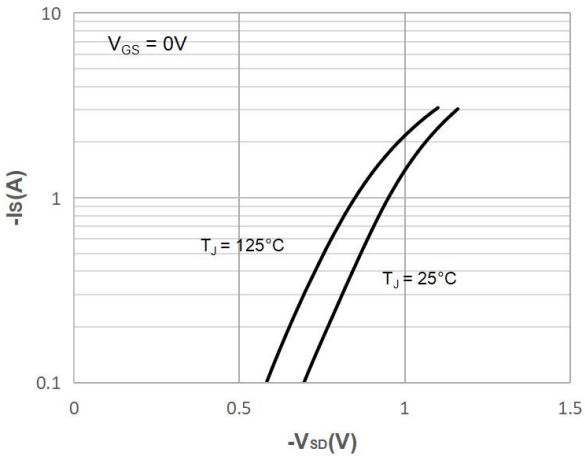


Figure 4: Body Diode Characteristics

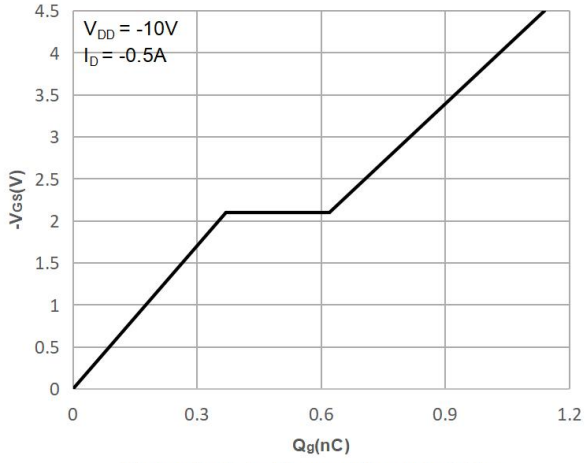


Figure 5: Gate Charge Characteristics

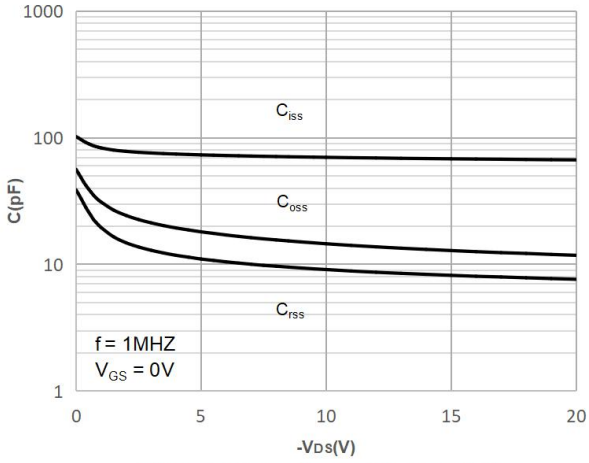


Figure 6: Capacitance Characteristics

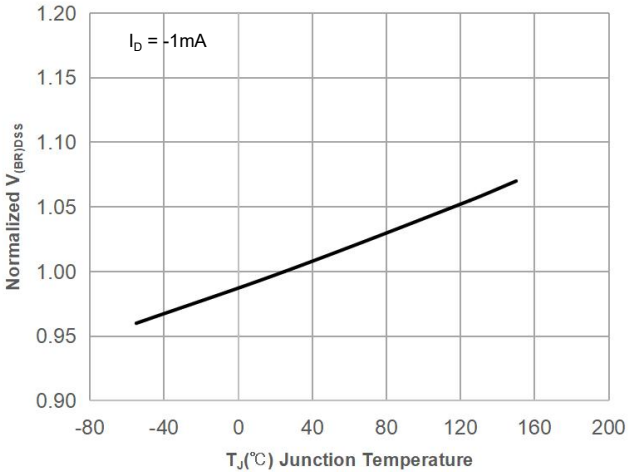


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

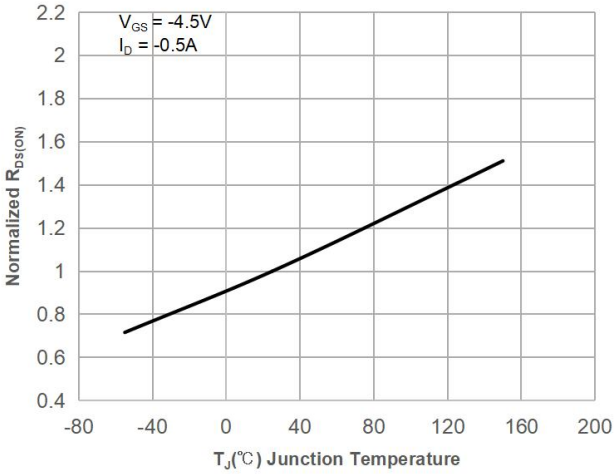


Figure 8: Normalized on Resistance vs. Junction Temperature

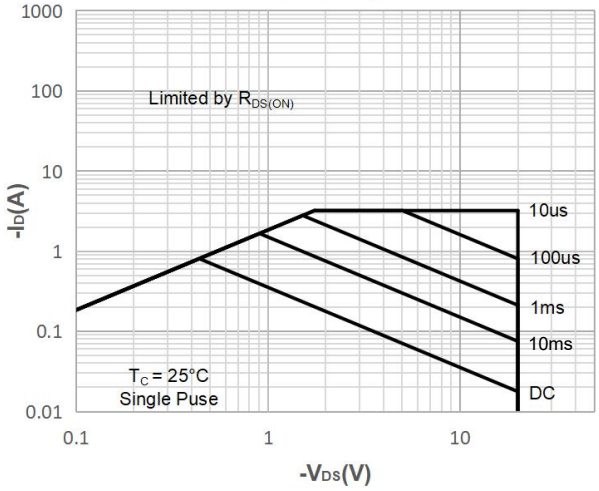


Figure 9: Maximum Safe Operating Area

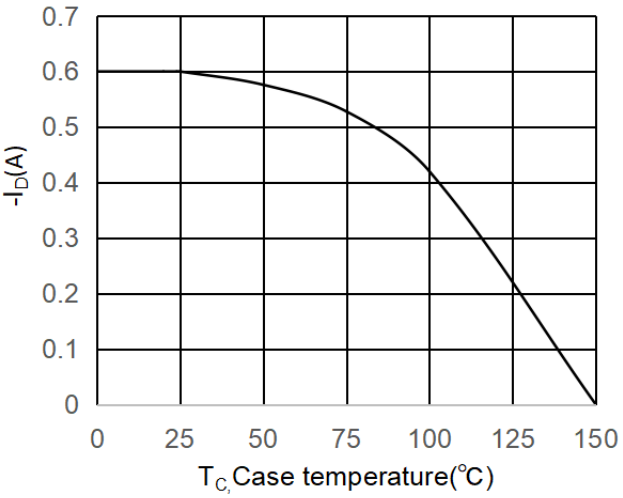


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

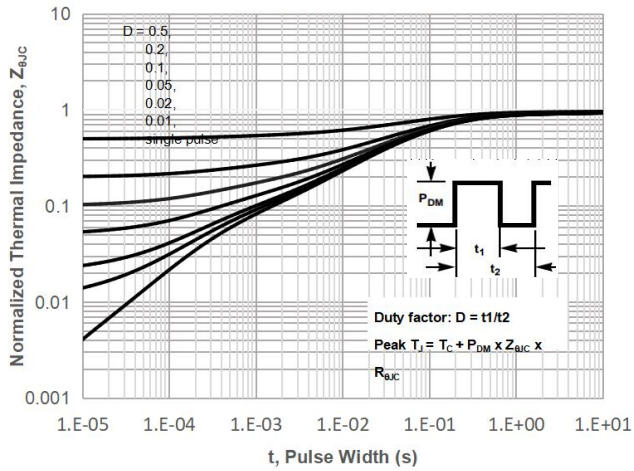


Figure 11: Normalized Maximum Transient Thermal Impedance

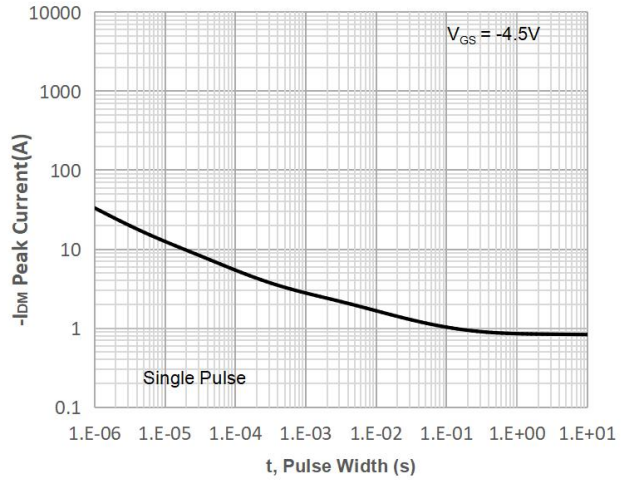
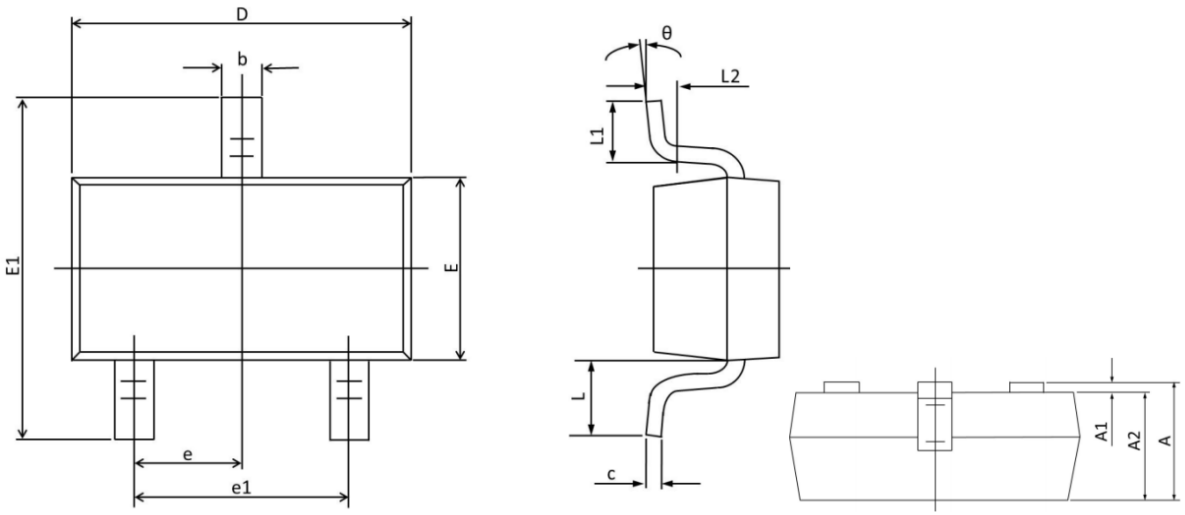


Figure 12: Peak Current Capacity

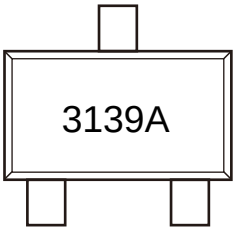
SOT- 323 Mechanical Data



Unit:mm

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
A1	0.100	0.000	0.004	0.000
A2	1.000	0.800	0.039	0.031
b	0.400	0.200	0.016	0.008
c	0.250	0.080	0.010	0.003
D	2.200	1.800	0.087	0.071
E	1.350	1.150	0.053	0.045
E1	2.450	1.800	0.096	0.071
e	0.65BSC		0.026BSC	
e1	1.400	1.200	0.055	0.047
L	0.525REF.		0.021REF.	
L1	0.460	0.150	0.018	0.006
L2	0.200	0.000	0.008	0.000
θ	8°	0°	8°	0°

Marking Information：



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2026-01-16	Release of final version

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