

Description

The DM3400DI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 20V$ $I_D = 3.2A$

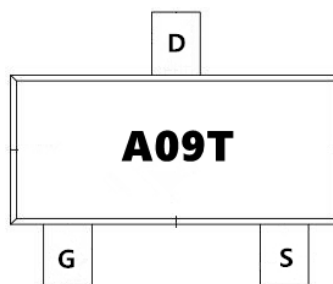
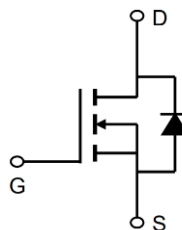
$R_{DS(ON)} < 56m\Omega$ @ $V_{GS}=10V$ (Type: 45m Ω)

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
DM3400DI	SOT23L	A09T	3000

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	20	V
V_{GSS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current $T_A = 25^\circ\text{C}$	3.2	A
I_D	Continuous Drain Current $T_A = 100^\circ\text{C}$	2	A
I_{DM}	Pulsed Drain Current	12	A
P_D	Power Dissipation $T_A = 25^\circ\text{C}$	0.77	W
$R_{\theta JA}$	Thermal Resistance, Junction to Case	162	$^\circ\text{C/W}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

20V N-Channel Enhancement Mode MOSFET
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	22	-	V
IDSS	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$	-	-	± 100	nA
VGS(th)	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4	0.6	1.2	V
RDS(on)	Static Drain-Source on-Resistance note2	$V_{GS}=4.5V, I_D=3A$	-	45	55	m Ω
		$V_{GS}=2.5V, I_D=2A$	-	62	85	
Ciss	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1.0MHz$	-	184	-	pF
Coss	Output Capacitance		-	38	-	pF
Crss	Reverse Transfer Capacitance		-	28	-	pF
Qg	Total Gate Charge	$V_{DS}=10V, I_D=3A,$ $V_{GS}=4.5V$	-	2.7	-	nC
Qgs	Gate-Source Charge		-	0.4	-	nC
Qgd	Gate-Drain("Miller") Charge		-	0.5	-	nC
td(on)	Turn-on Delay Time	$V_{DS}=10V,$ $I_D=3A, R_{GEN}=3\Omega,$ $V_{GS}=4.5V$	-	2.3	-	ns
tr	Turn-on Rise Time		-	3.1	-	ns
td(off)	Turn-off Delay Time		-	9.2	-	ns
tf	Turn-off Fall Time		-	2.5	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	3	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	12	A
VSD	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=3A$	-	-	1.2	V

Note :

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2、The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The power dissipation is limited by 150 $^{\circ}\text{C}$ junction temperature
- 4、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

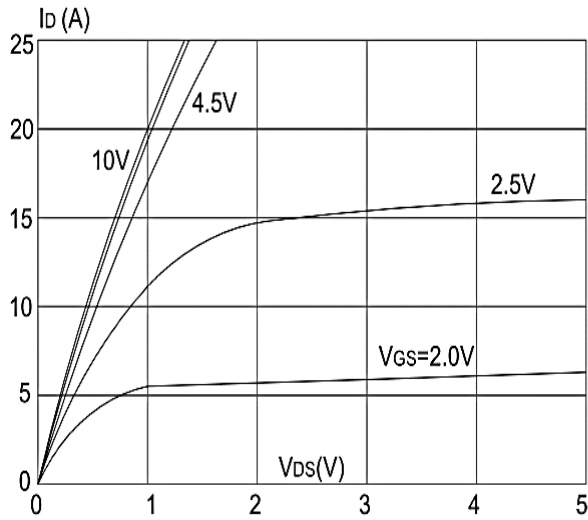


Figure1: Output Characteristics

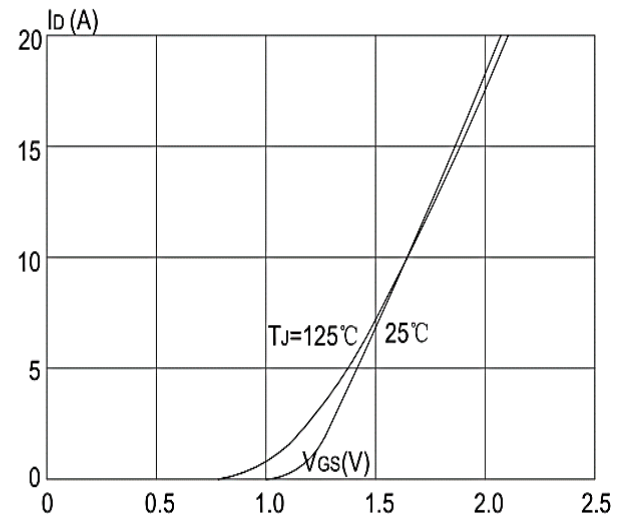


Figure 2: Typical Transfer Characteristics

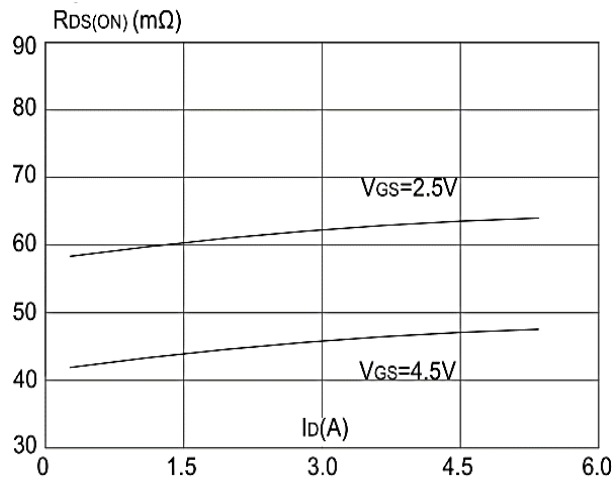


Figure 3: On-resistance vs. Drain Current

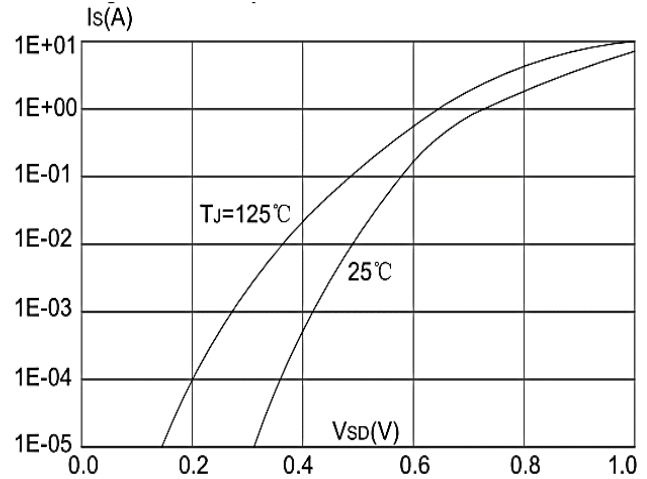


Figure 4: Body Diode Characteristics

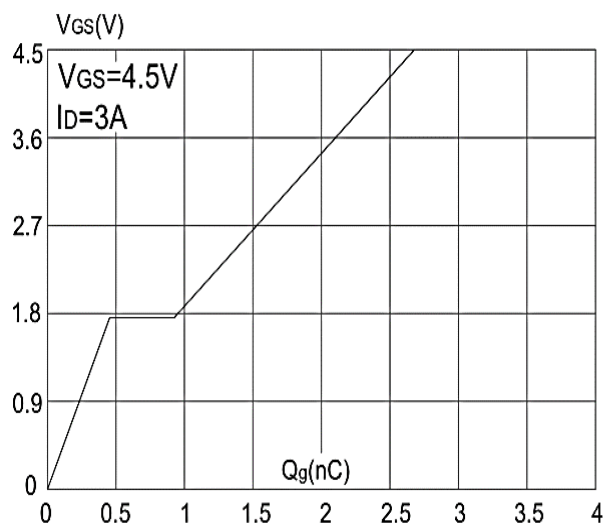


Figure 5: Gate Charge Characteristics

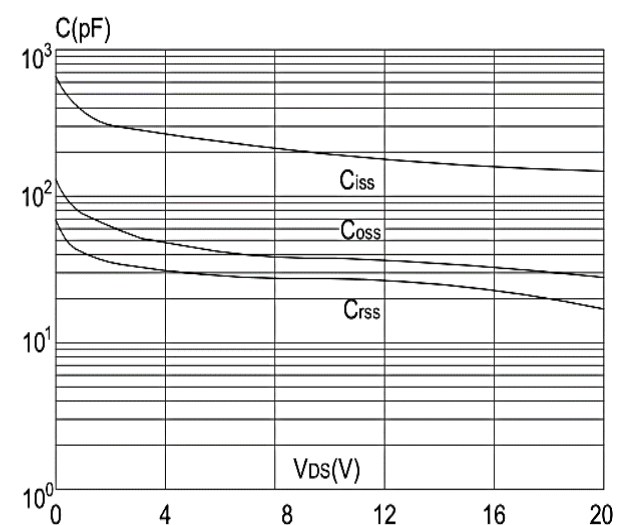


Figure 6: Capacitance Characteristics

20V N-Channel Enhancement Mode MOSFET

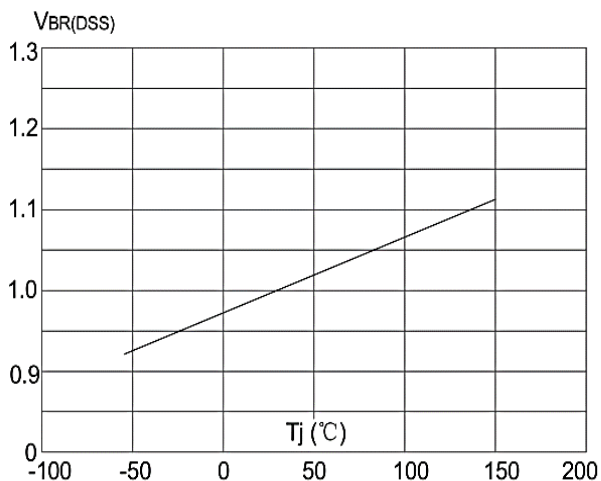


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

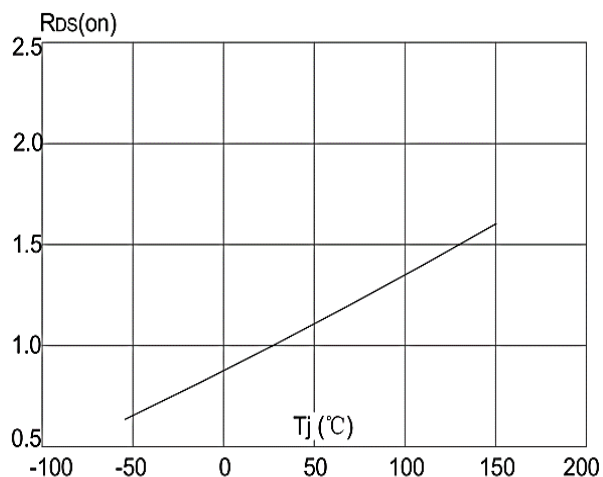


Figure 8: Normalized on Resistance vs. Junction Temperature

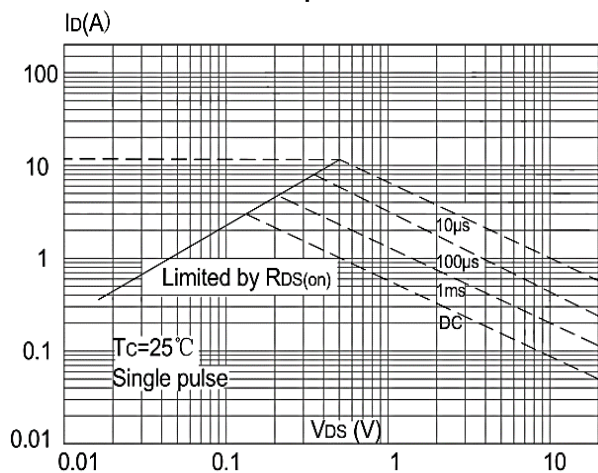


Figure 9: Maximum Safe Operating Area

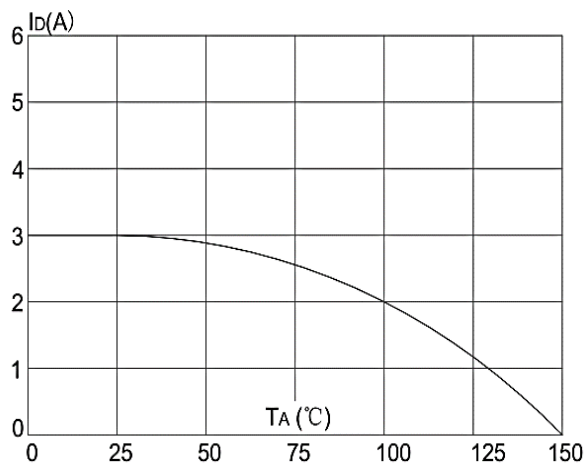


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

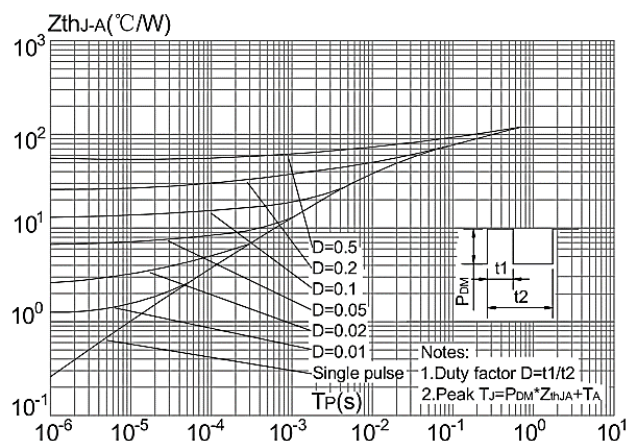
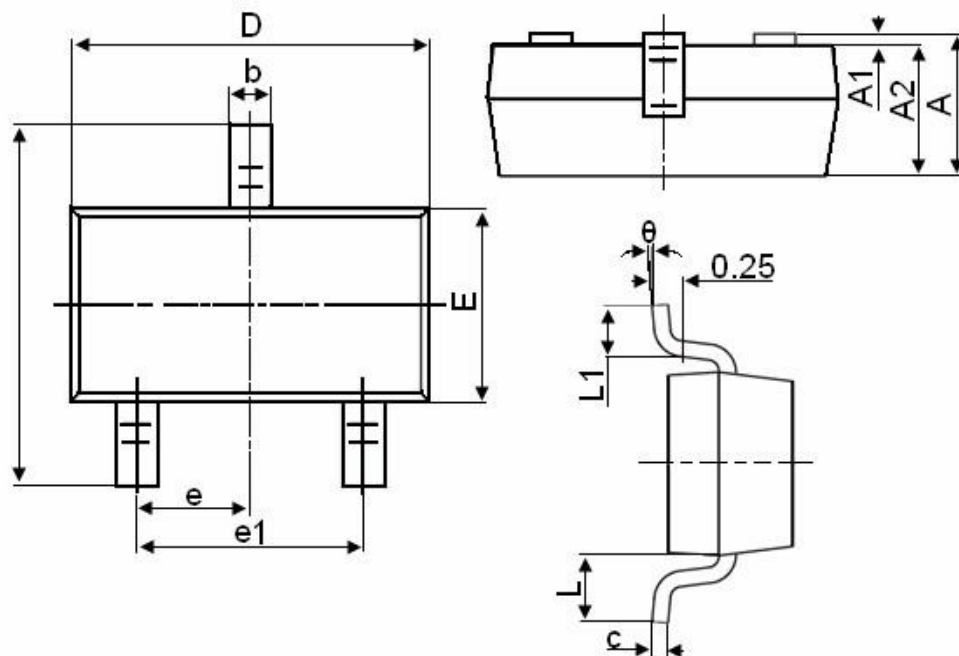


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Package Mechanical Data-SOT23-XC-Single


Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°