

Description

The LM3404B uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

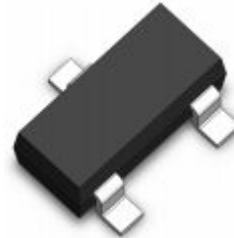
General Features

$V_{DS} = 30V$ $I_D = 4.2A$
 $R_{DS(ON)} < 38m\Omega$ @ $V_{GS}=10V$

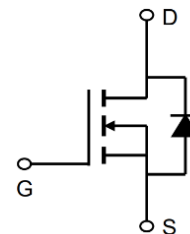
Application

- Lithium battery protection
- Wireless impact
- Mobile phone fast charging

Dimensions SOT-23



Pin Configuration



Package Marking and Ordering Information

Device	Device Marking	Device Package	Reel Size	Tape width	Quantity
LM3404B	3404B	SOT-23	Ø180mm	8 mm	3000 units

Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	30	V
VGSS	Gate-Source Voltage	±20	V
$I_D@T_A=25^\circ C$	Continuous Drain Current	4.2	A
$I_D@T_A=70^\circ C$	Continuous Drain Current	2.6	A
IDM	Pulsed Drain Current	16	A
P_D	Power Dissipation $T_A = 25^\circ C$	1	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	125	°C/W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +150	°C

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	32	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.2	1.5	2.5	V
RDS(on)	Static Drain-Source on-Resistance note2	V _{GS} =10V, I _D =4A	-	29	38	mΩ
		V _{GS} =4.5V, I _D =3A	-	45	65	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1.0MHz	-	233	-	pF
C _{oss}	Output Capacitance		-	44	-	pF
C _{rss}	Reverse Transfer Capacitance		-	33	-	pF
Q _g	Total Gate Charge	V _{DS} =15V, I _D =2A, V _{GS} =10V	-	3	-	nC
Q _{gs}	Gate-Source Charge		-	0.5	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	0.8	-	nC
td(on)	Turn-on Delay Time	V _{DS} =15V, I _D =4A, R _{GEN} =3Ω, V _{GS} =10V	-	4	-	ns
t _r	Turn-on Rise Time		-	2.1	-	ns
td(off)	Turn-off Delay Time		-	15	-	ns
t _f	Turn-off Fall Time		-	3.2	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	4	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	16	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =4A	-	-	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°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

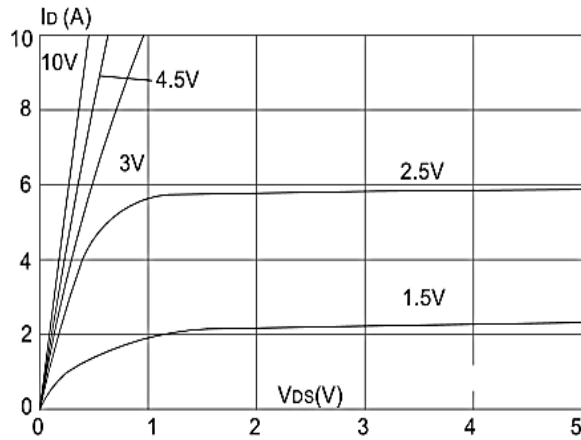


Figure1: Output Characteristics

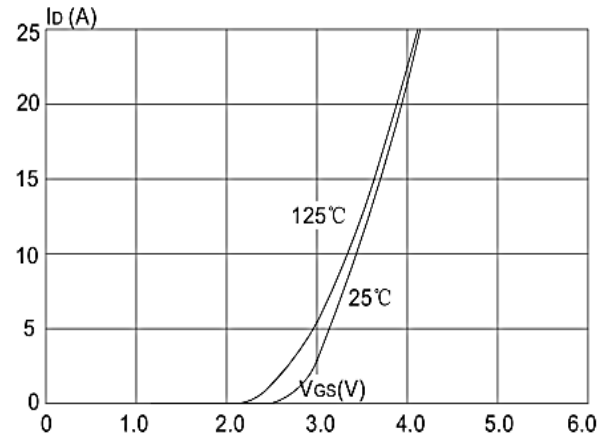


Figure 2: Typical Transfer Characteristics

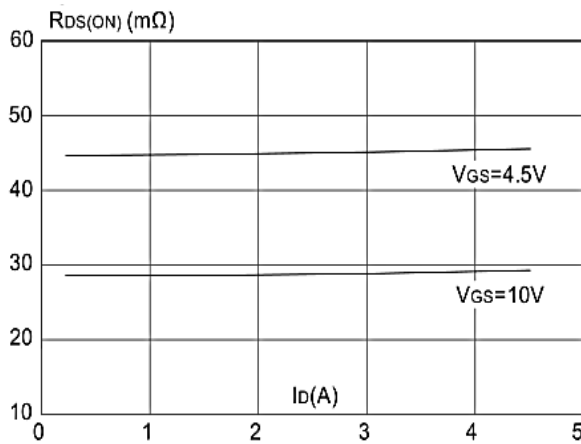


Figure 3: On-resistance vs. Drain Current

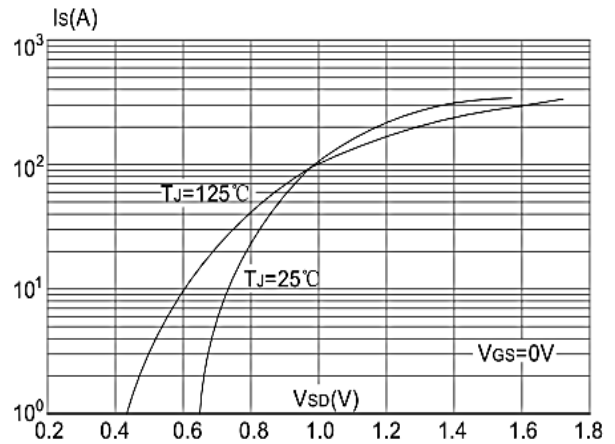


Figure 4: Body Diode Characteristics

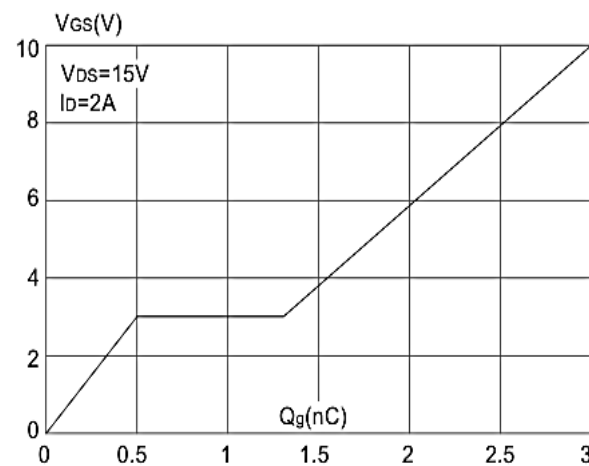


Figure 5: Gate Charge Characteristics

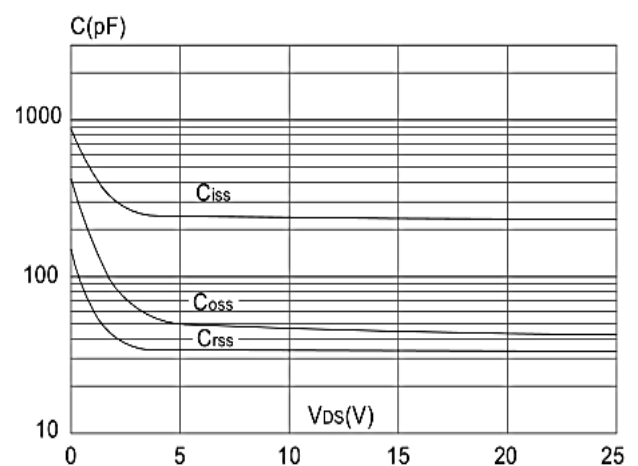


Figure 6: Capacitance Characteristics

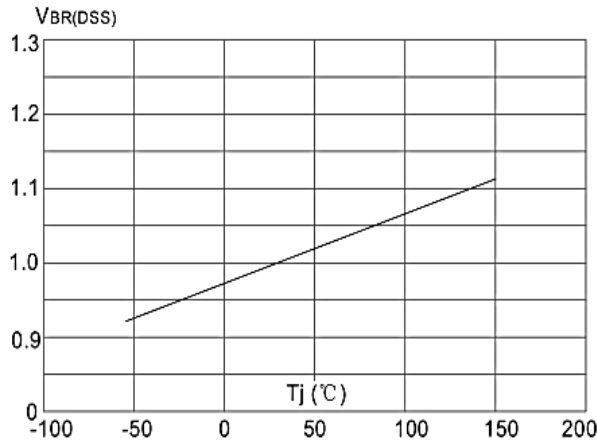


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

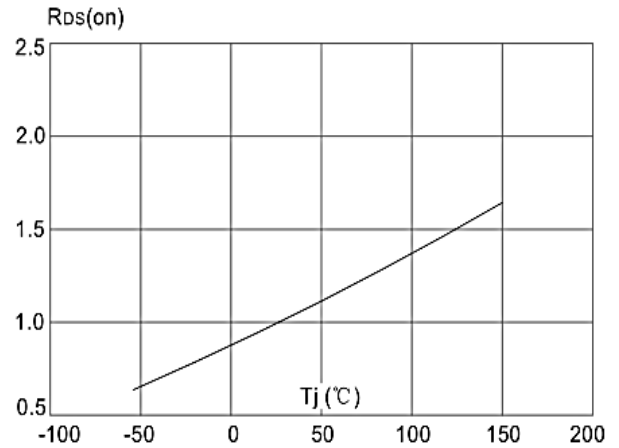


Figure 8: Normalized on Resistance vs. Junction Temperature

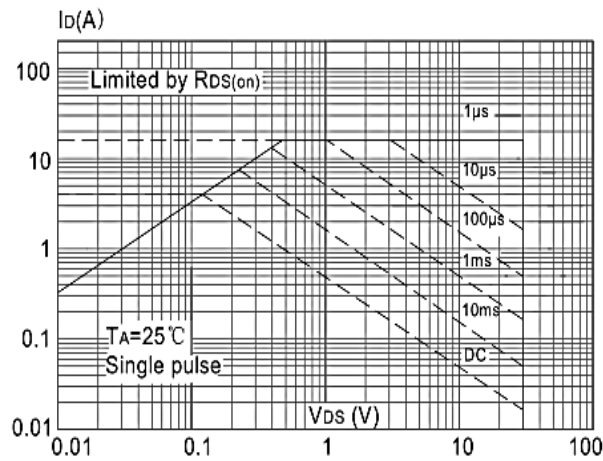


Figure 9: Maximum Safe Operating Area vs. Case Temperature

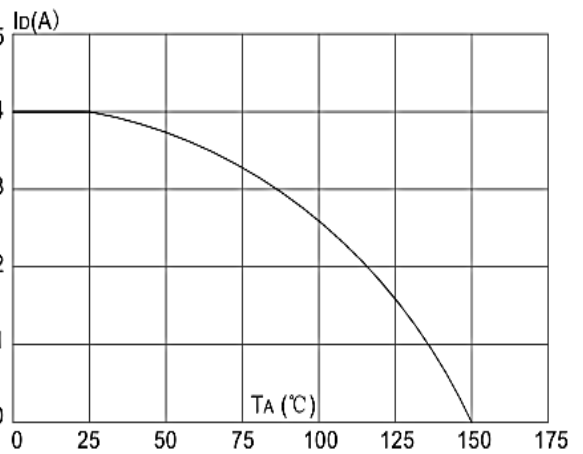


Figure 10: Maximum Continuous Drain Current

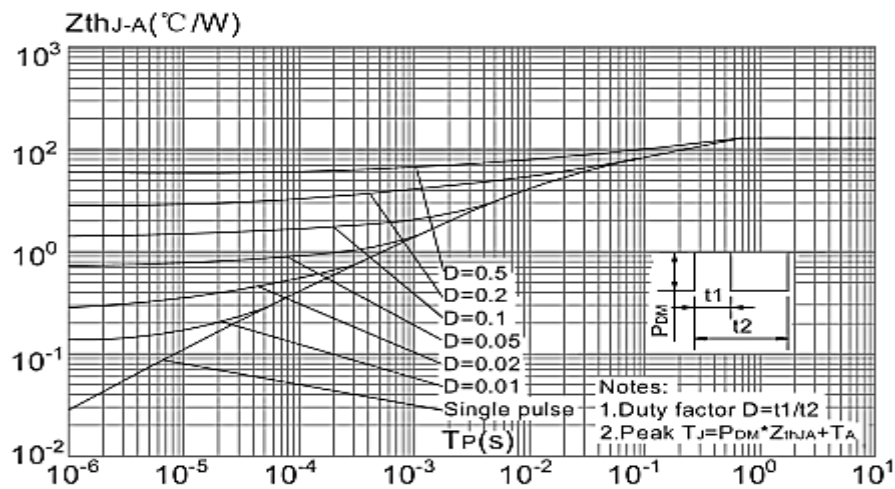
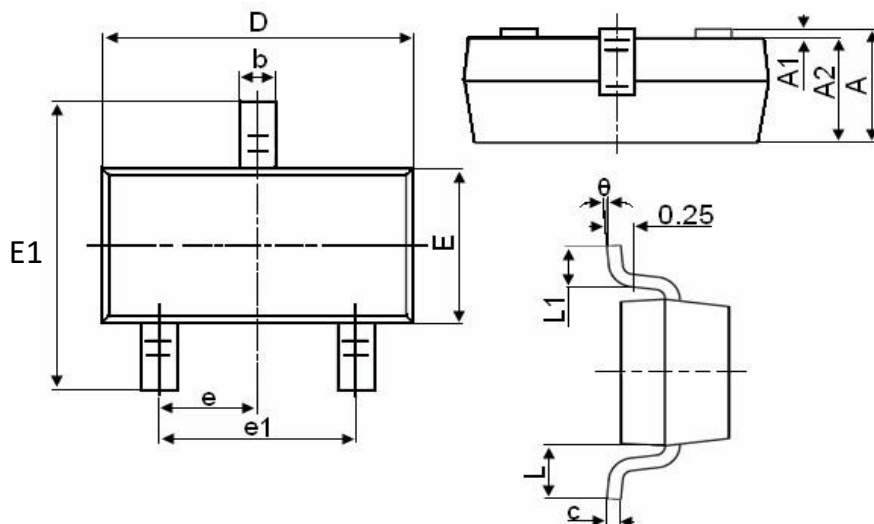


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Mechanical Data:SOT-23



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°