

General Description

The M10YB06C 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.

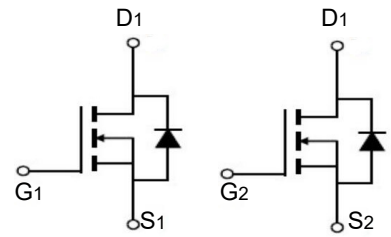
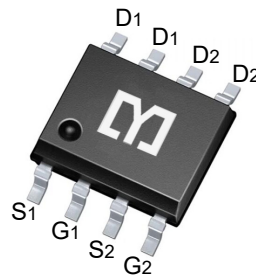


Features

V_{DSS}	60	V
I_D	10	A
$P_D(T_C=25^\circ C)$	2.0	W
$R_{DS(ON)}(at V_{GS}=10V)$	<30	m Ω

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
M10YB06C	SOP-8	10B06C	3000

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	10	A
Drain Current-Continuous($T_C=100^\circ C$)	$I_D(100^\circ C)$	3.5	A
Pulsed Drain Current	I_{DM}	24	A
Maximum Power Dissipation	P_D	2	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	62.5	$^\circ C/W$

Electrical Characteristics ($T_J=25\text{ }^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.6	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$	-	26	35	m Ω
	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=5A$	-	32	45	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=5A$	11	-	-	S
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V,$ $F=1.0MHz$	-	979	-	PF
Output Capacitance	C_{oss}		-	120	-	PF
Reverse Transfer Capacitance	C_{rss}		-	100	-	PF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=30V, R_L=6.7\Omega$ $V_{GS}=10V, R_G=3\Omega$	-	5.2	-	nS
Turn-on Rise Time	t_r		-	3	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	17	-	nS
Turn-Off Fall Time	t_f		-	2.5	-	nS
Total Gate Charge	Q_g	$V_{DS}=30V, I_D=5A,$ $V_{GS}=10V$	-	22	-	nC
Gate-Source Charge	Q_{gs}		-	3.3	-	nC
Gate-Drain Charge	Q_{gd}		-	5.2	-	nC
Diode Forward Voltage ^(Note 3)	V_{SD}	$V_{GS}=0V, I_S=5A$	-	-	1.2	V
Diode Forward Current ^(Note 2)	I_S		-	-	5	A
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition: $T_J=25\text{ }^\circ\text{C}, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25\Omega$

Typical Characteristics

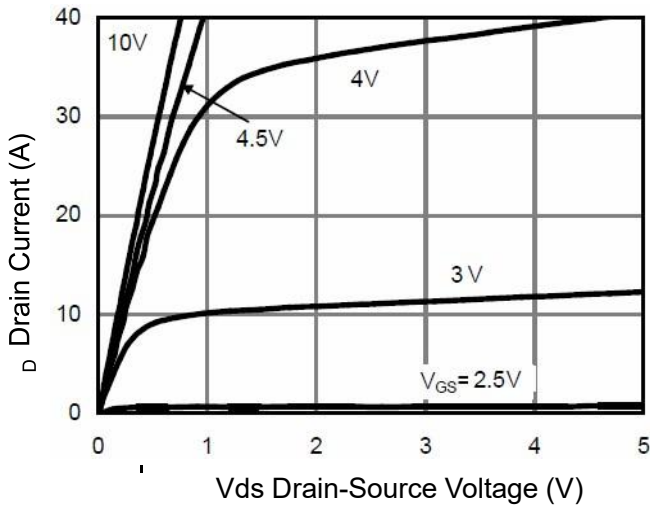


Figure 1 Output Characteristics

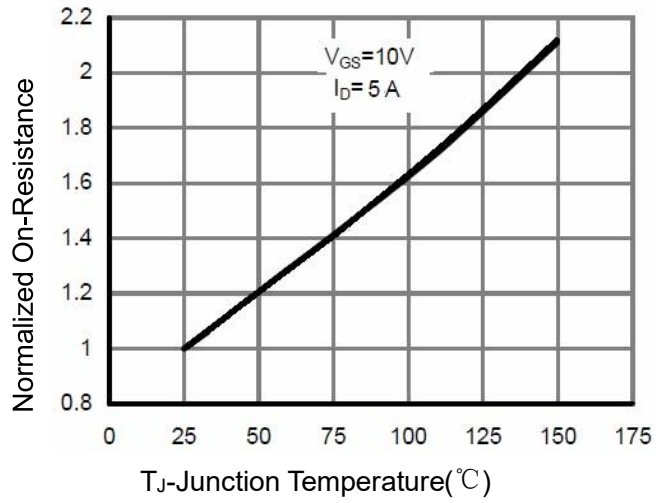


Figure 4 Rdson-Junction Temperature

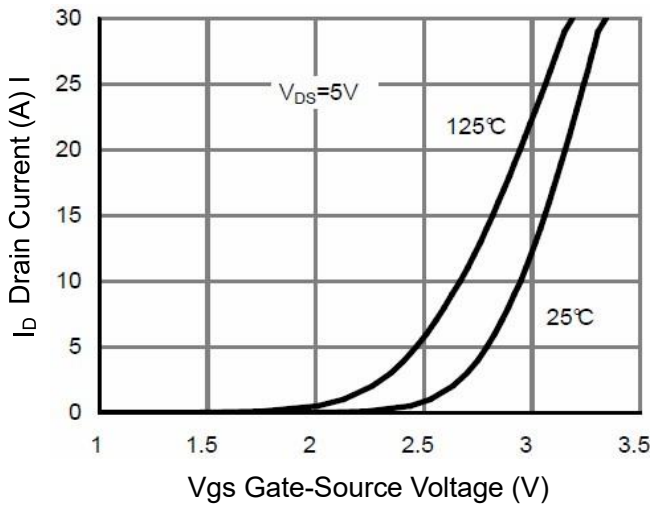


Figure 2 Transfer Characteristics

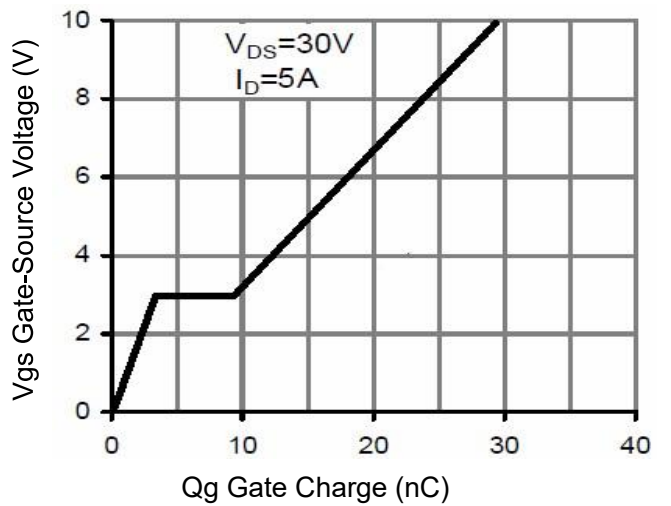


Figure 5 Gate Charge

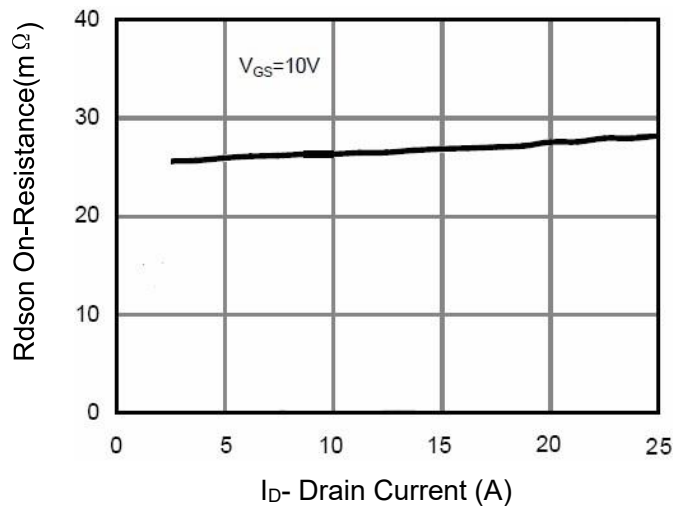


Figure 3 Rdson- Drain Current

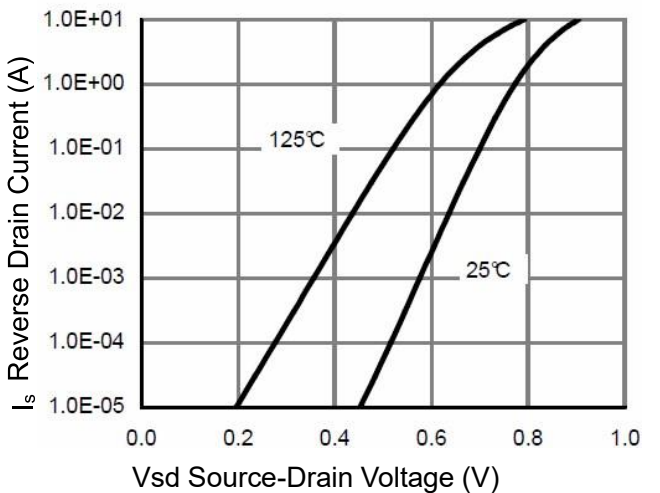


Figure 6 Source- Drain Diode Forward

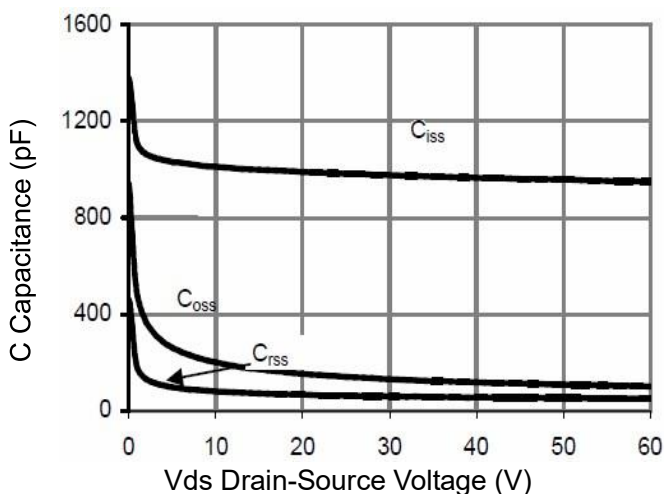


Figure 7 Capacitance vs Vds

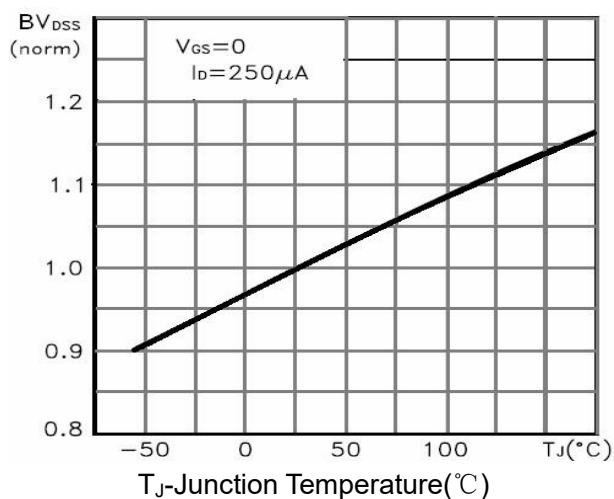


Figure 9 BV_{DSS} vs Junction Temperature

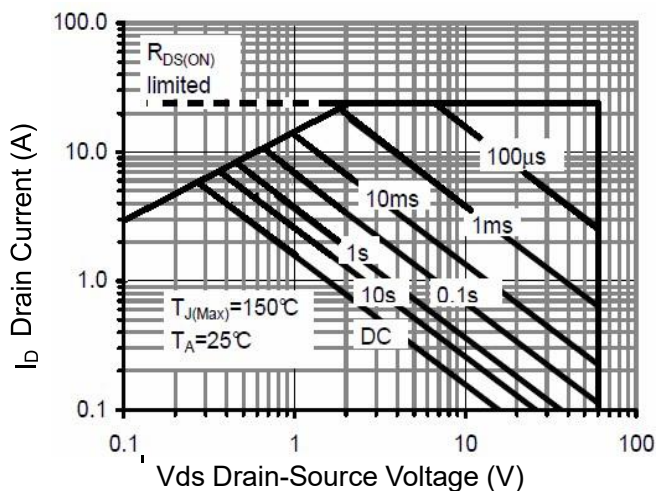


Figure 8 Safe Operation Area

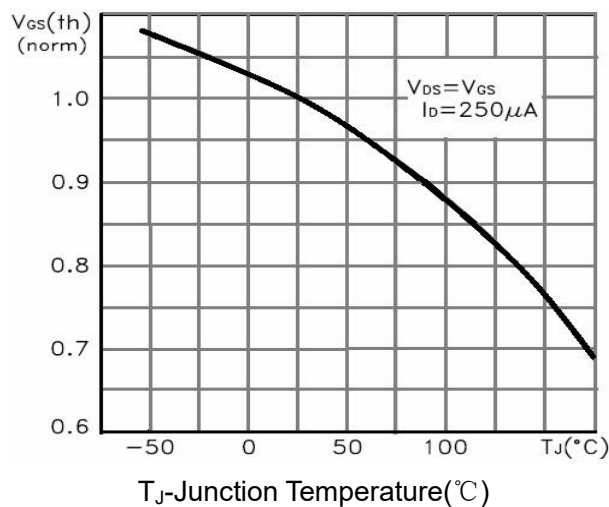


Figure 10 V_{GS(th)} vs Junction

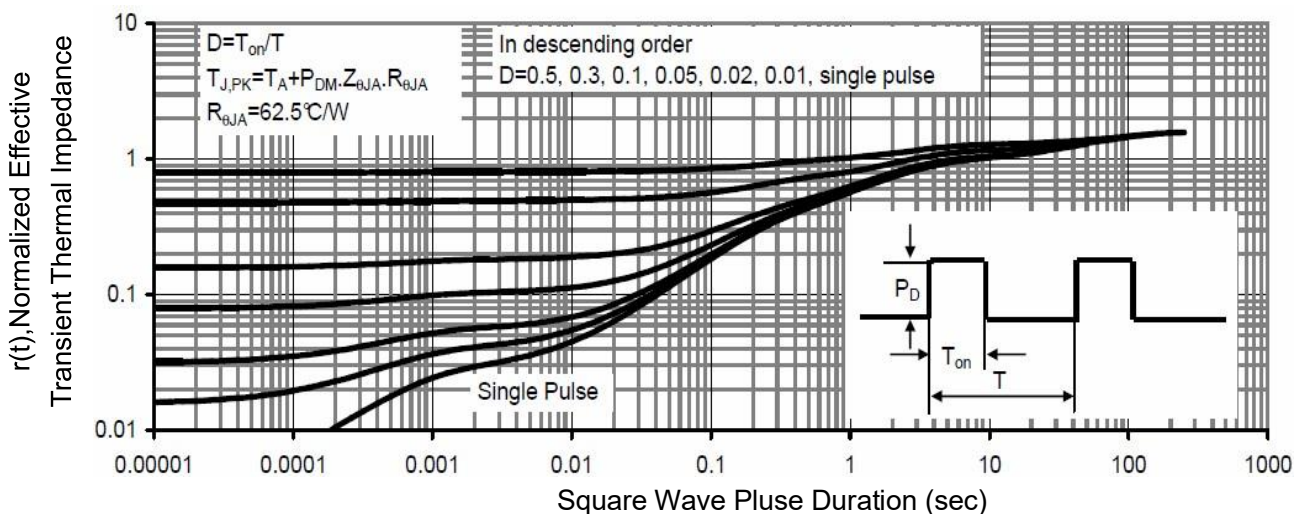


Figure 11 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-SOP-8

