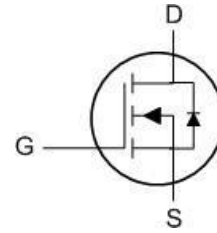




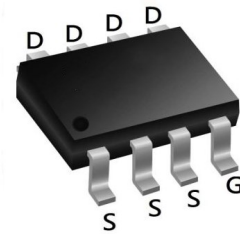
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology



### Description

The WLB10N06 is the high performance complementary N-ch MOSFETs with high cell density, which provide excellent R<sub>DS(on)</sub> and gate charge for most of the synchronous buck converter applications. The WLB10N06 meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

### SOP8 Pin Configuration



### Product Summary

BVDSS	R <sub>DS(on)</sub>	I <sub>D</sub>
60V	34.5mΩ	10A

### Absolute Maximum Ratings (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	60	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> = 25°C	10
		T <sub>C</sub> = 100°C	6.8
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	30	A
EAS	Single Pulsed Avalanche Energy <sup>note2</sup>	6.3	mJ
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> = 25°C	4
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	63	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +175	°C



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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V,$	-	-	1.0	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.6	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note3</small>	$V_{GS}=10V, I_D=15A$	-	34.5	44	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$	-	41.5	54	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0MHz$	-	825	-	pF
$C_{oss}$	Output Capacitance		-	49	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	41	-	pF
$Q_g$	Total Gate Charge	$V_{DS}=30V, I_D=4.5A,$ $V_{GS}=10V$	-	14	-	nC
$Q_{gs}$	Gate-Source Charge		-	2.9	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	5.2	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=30V, I_D=2A,$ $R_L=6.7\Omega, R_G=3\Omega,$ $V_{GS}=10V$	-	5	-	ns
$t_r$	Turn-on Rise Time		-	2.6	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	16.1	-	ns
$t_f$	Turn-off Fall Time		-	2.3	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	30	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=15A$	-	-	1.2	V
$t_{rr}$	Body Diode Reverse Recovery Time	$T_J=25^{\circ}\text{C}, I_F=15A,$ $di/dt=100A/\mu s$	-	35	-	ns
$Q_{rr}$	Body Diode Reverse Recovery Charge		-	53	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition :  $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25\Omega, I_{AS}=6.1A$

3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$



### Typical Performance Characteristics

Figure 1: Output Characteristics

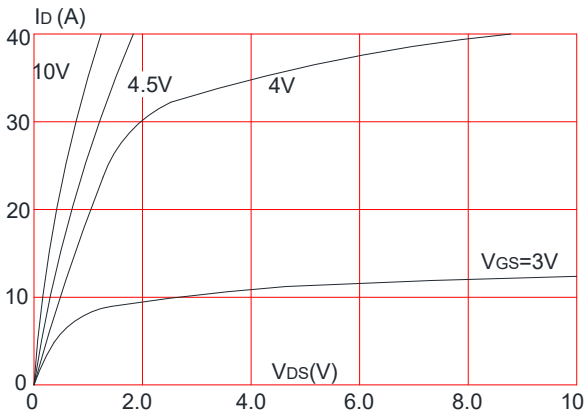


Figure 2: Typical Transfer Characteristics

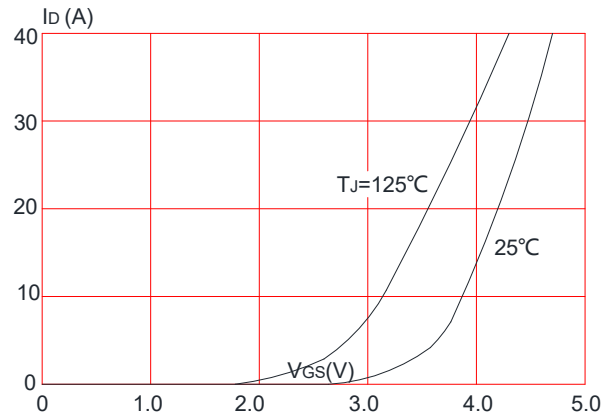


Figure 3: On-resistance vs. Drain Current

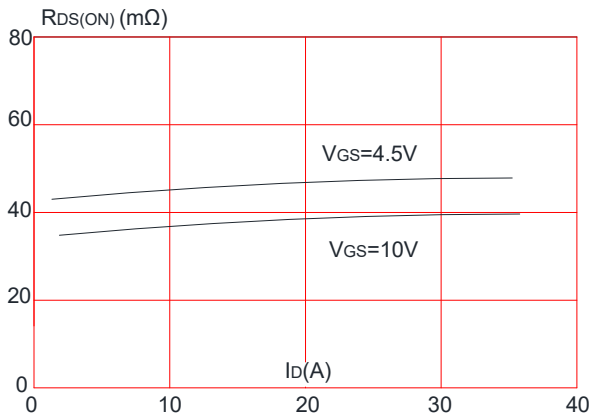


Figure 4: Body Diode Characteristics

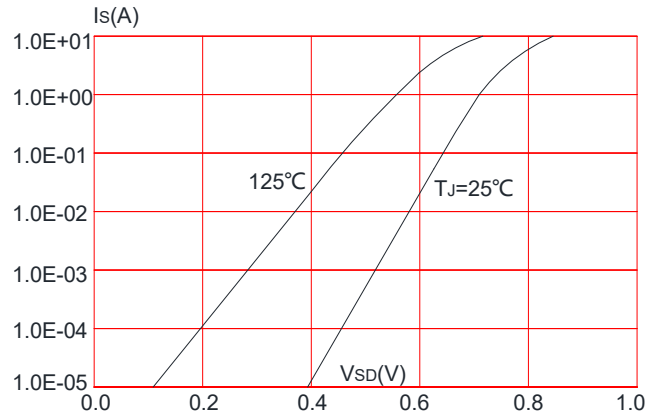


Figure 5: Gate Charge Characteristics

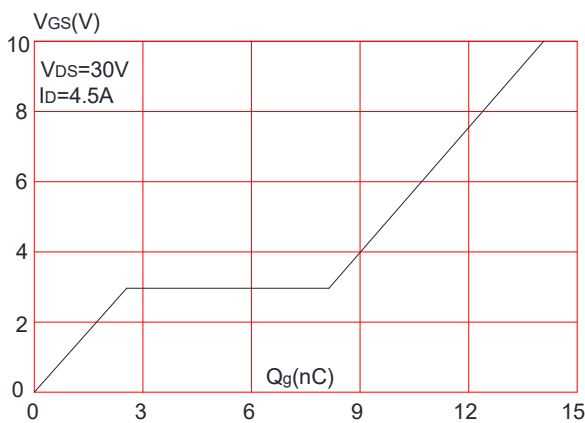
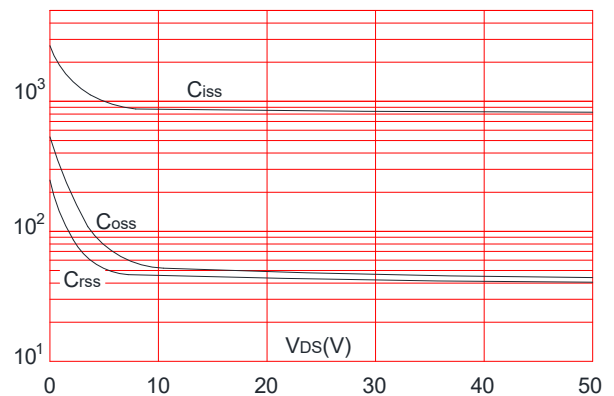
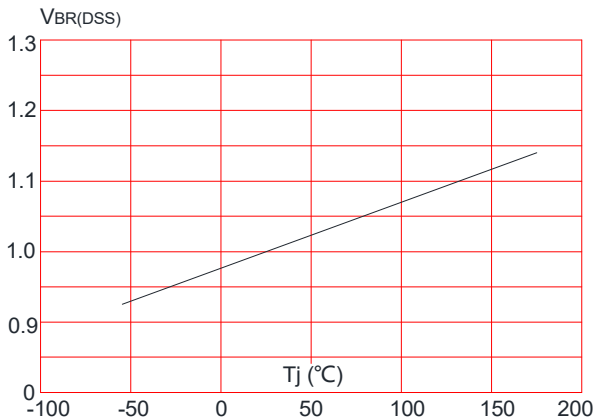


Figure 6: Capacitance Characteristics

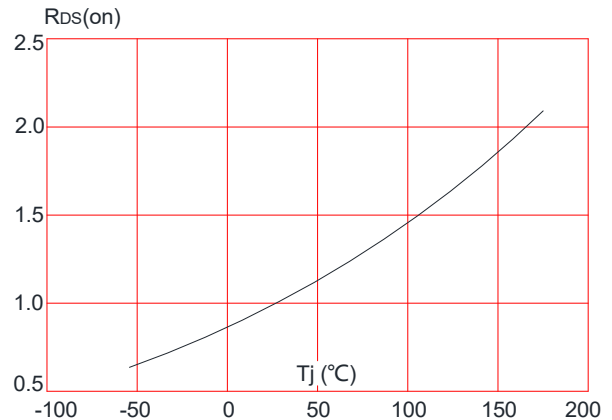




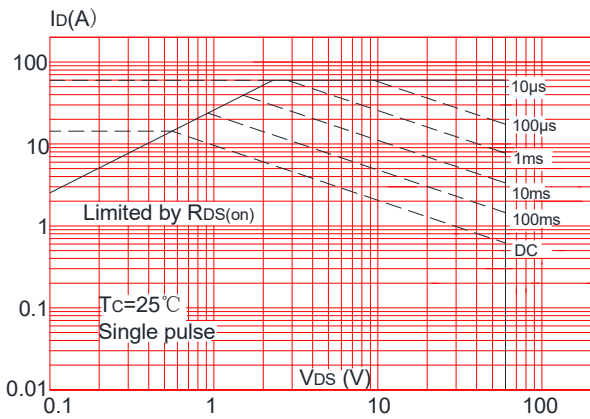
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



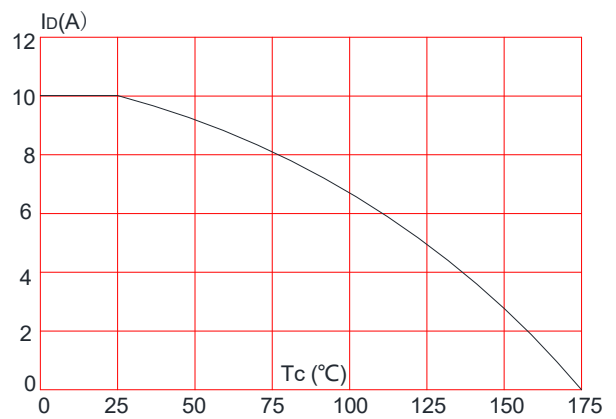
**Figure 8:** Normalized on Resistance vs. Junction Temperature



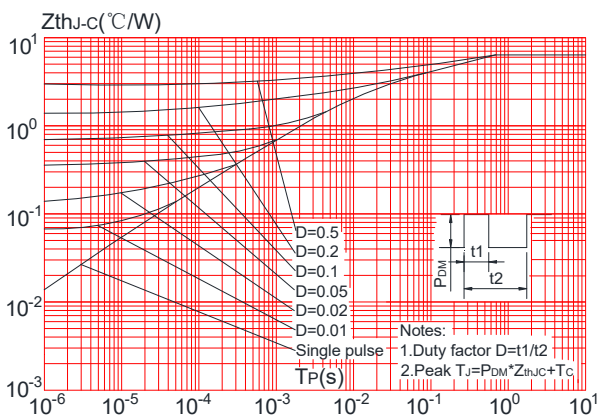
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

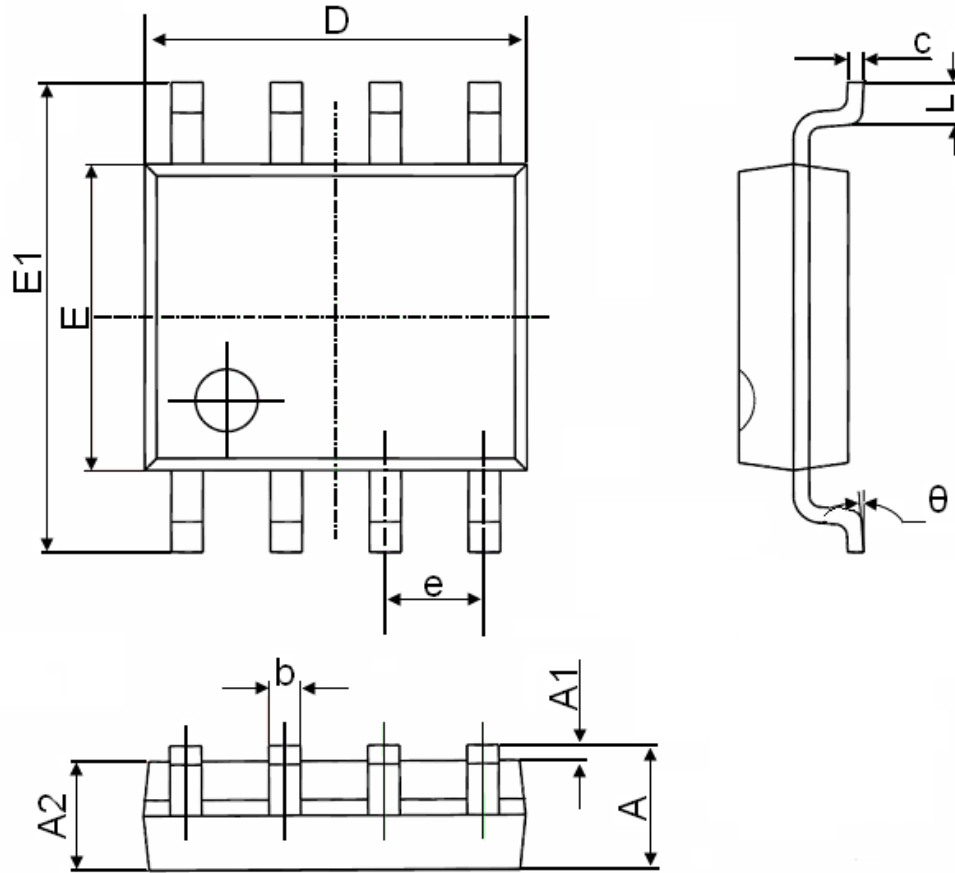


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case





**SOP-8 Package Information**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
$\theta$	0°	8°	0°	8°



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