

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary



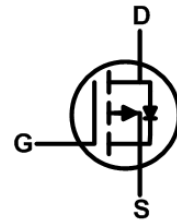
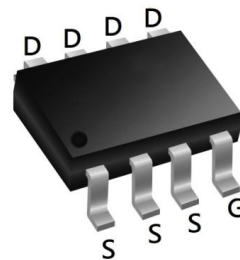
BVDSS	RDSON	ID
-30V	9.5 mΩ	-12 A

General Description

The SL12P03S is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The SL12P03S meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

SOP8 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-12	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-9	A
I_{DM}	Pulsed Drain Current ²	-46	A
EAS	Single Pulse Avalanche Energy ³	55	mJ
I_{AS}	Avalanche Current	-50	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ⁴	4.5	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	75	$^\circ C/W$
	Thermal Resistance Junction-Ambient ¹ ($t \leq 10s$)	---	40	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	24	$^\circ C/W$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-30V, V_{GS}=0V,$	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.6	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance Note3	$V_{GS}=-10V, I_D=-10A$	-	9.5	14	m Ω
		$V_{GS}=-4.5V, I_D=-5A$	-	17	24	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V,$ $f=1.0MHz$	-	1770	-	pF
C_{oss}	Output Capacitance		-	233	-	pF
C_{rss}	Reverse Transfer Capacitance		-	206	-	pF
Q_g	Total Gate Charge	$V_{DS}=-15V, I_D=-5A,$ $V_{GS}=-10V$	-	22	-	nC
Q_{gs}	Gate-Source Charge		-	1.0	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	1.8	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=-15V, I_D=-10A,$ $V_{GS}=-10V, R_{GEN}=2.5\Omega$	-	9	-	ns
t_r	Turn-on Rise Time		-	13	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	48	-	ns
t_f	Turn-off Fall Time		-	20	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-15	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-60	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=-15A$	-	-0.8	-1.2	V
t_{rr}	Reverse Recovery Time	$T_J=25^\circ\text{C},$	-	64	-	ns
Q_{rr}	Reverse Recovery Charge	$V_{DD}=-24V, I_F=-2.8A,$ $di/dt=-100A/\mu s$	-	25	-	nC

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

2. EAS condition: $T_J=25^\circ\text{C}, V_{GS}=10V, R_G=25\Omega, L=0.5mH, I_{AS}=-12.7A$

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

Typical Performance Characteristics

Figure 1: Output Characteristics

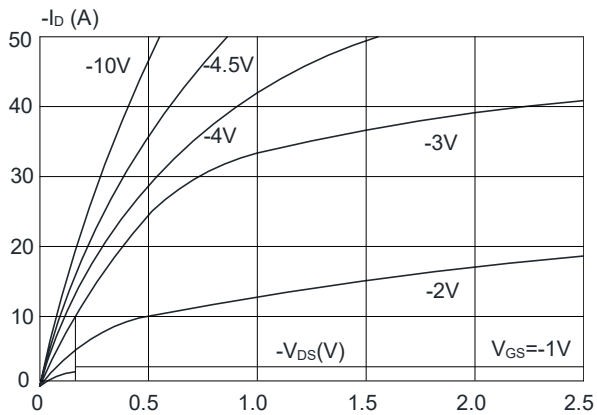


Figure 2: Typical Transfer Characteristics

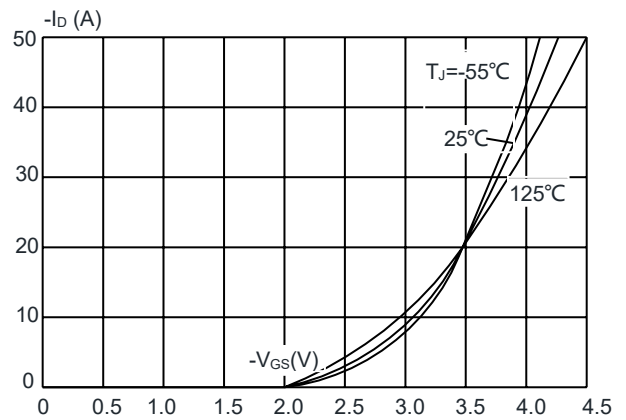


Figure 3: On-resistance vs. Drain Current

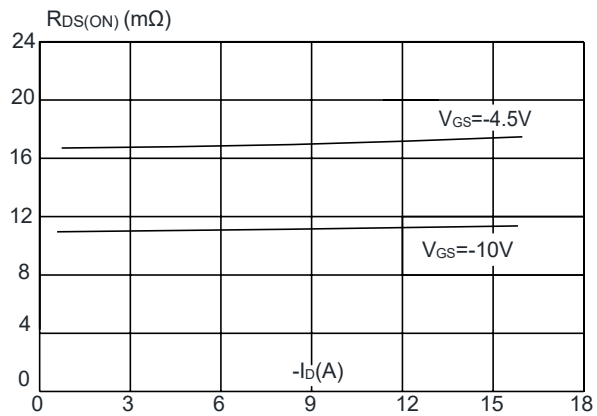


Figure 4: Body Diode Characteristics

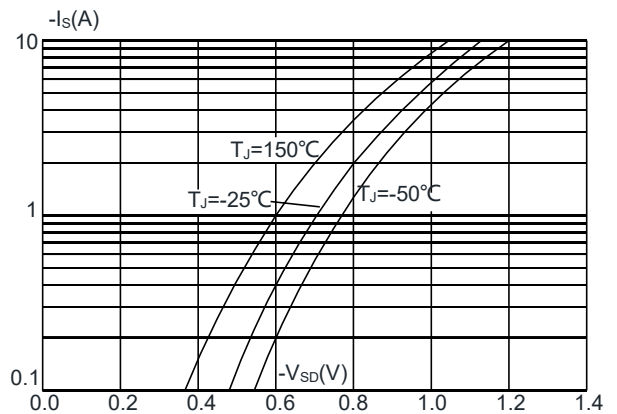


Figure 5: Gate Charge Characteristics

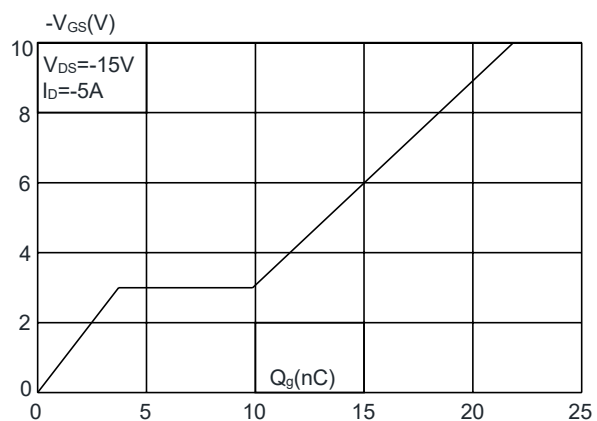


Figure 6: Capacitance Characteristics

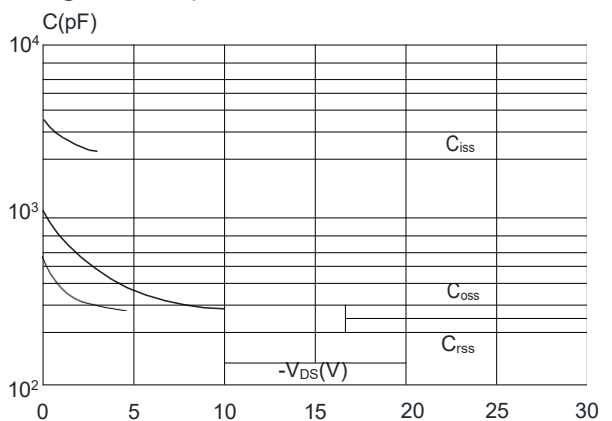


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

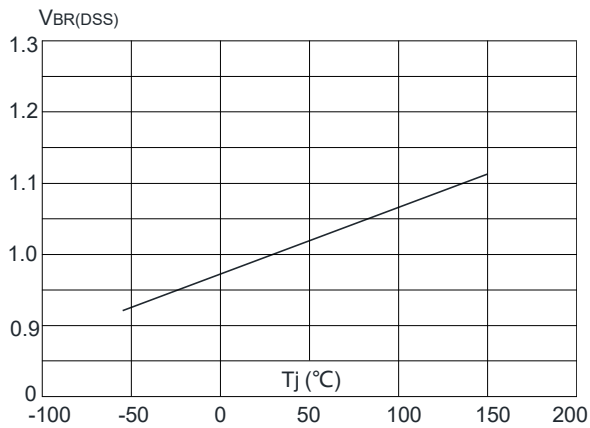


Figure 8: Normalized on Resistance vs. Junction Temperature

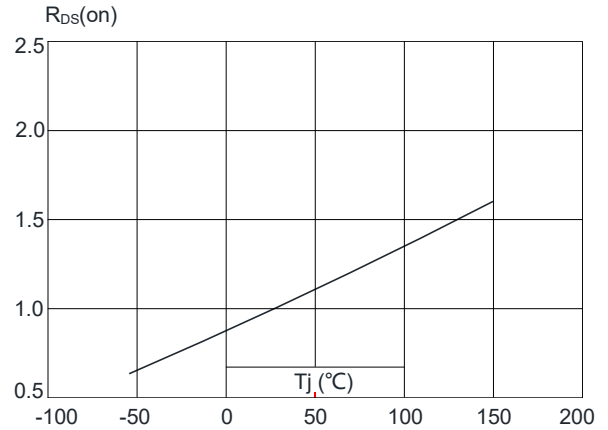


Figure 9: Maximum Safe Operating Area

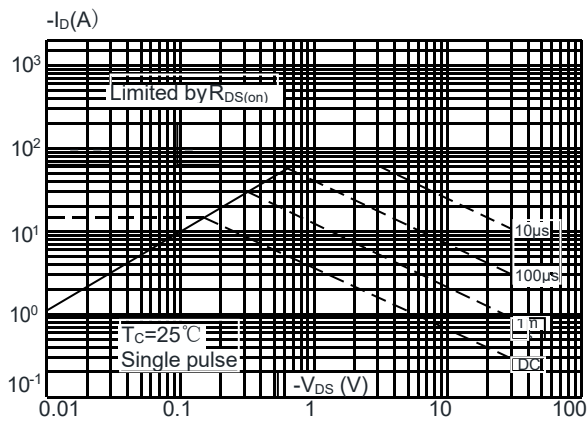


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

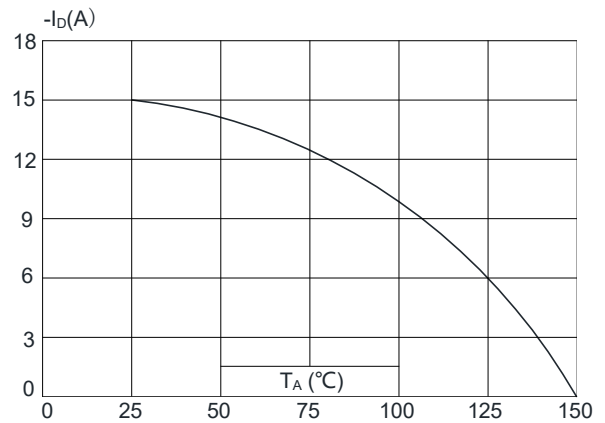
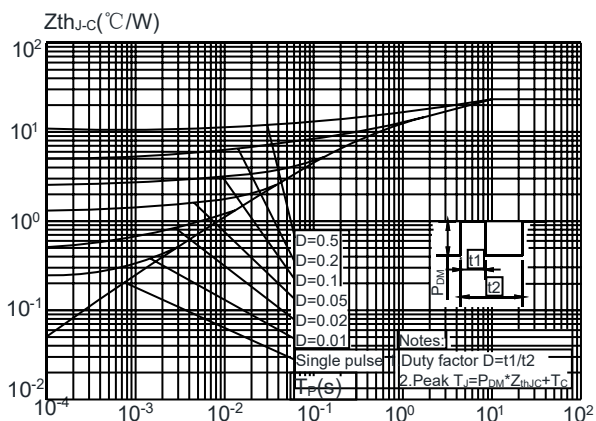
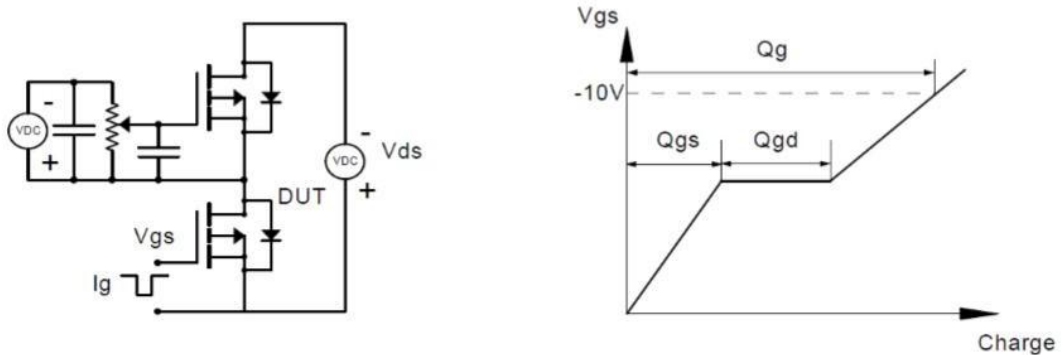


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

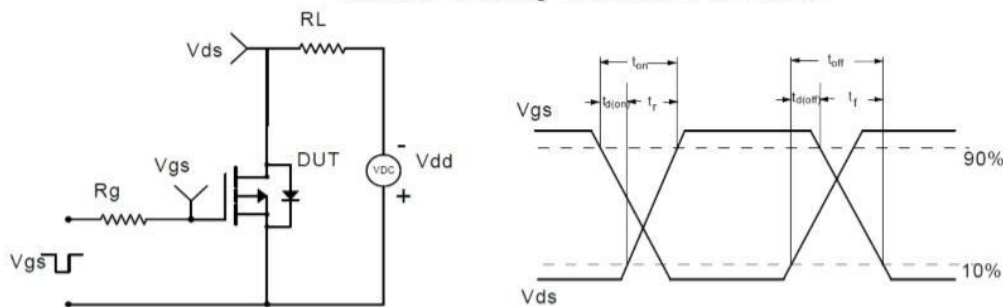


Test Circuit

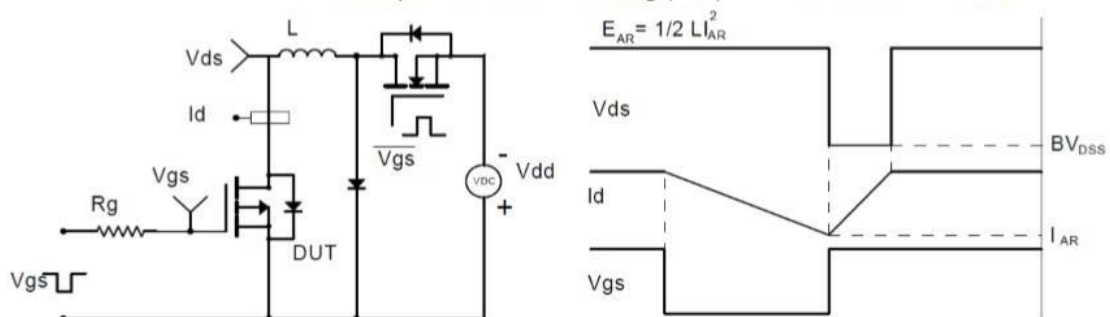
Gate Charge Test Circuit & Waveform



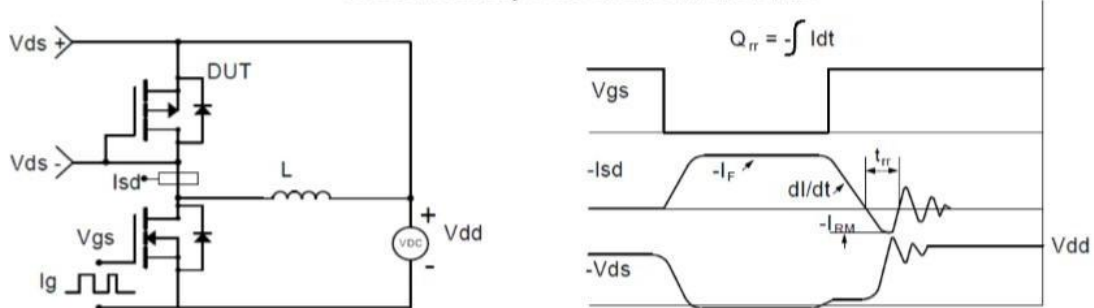
Resistive Switching Test Circuit & Waveforms



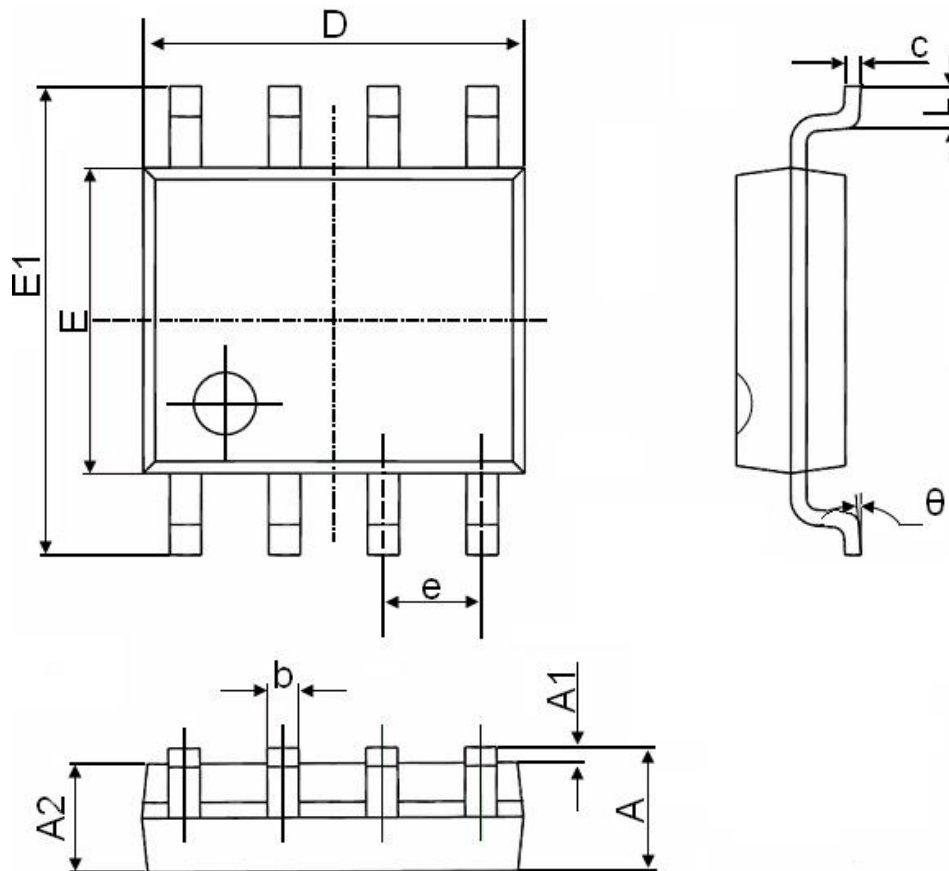
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



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
θ	0°	8°	0°	8°

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