AS13ND012EWL

Dual N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)SSS}$	$R_{SS(on)MAX}$	I_S
12V	2.75mΩ@4.5V	13A
	6.1mΩ@2.5V	

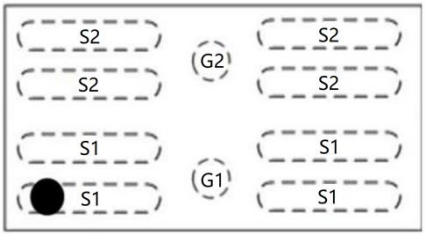
Feature

- Trench MOSFET Technology
- Extremely low $R_{SS(on)}$
- ESD Protected

Application

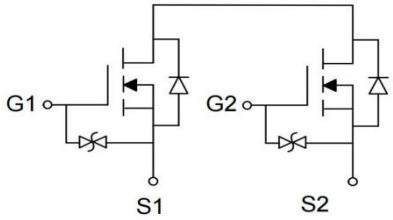
- Battery Protection

Package

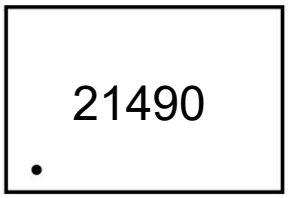


WLCSP-10L

Circuit diagram



Marking



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Absolute maximum ratings (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Source-Source Voltage	V_{SS}	12	V
Gate-Source Voltage	V_{GS}	±8	V
Continuous Source Current[1] (T_C=25°C)	I_S	13	A
Continuous Source Current (T_C=100°C)	I_S(100°C)	10	A
Pulsed Source Current[2]	I_{SM}	52	A
Power Dissipation (T_C=25°C)	P_D	0.5	W
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	250	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Source-source breakdown voltage	$V_{(BR)SSS}$	V_{GS} = 0V, I_S =250μA	12			V
Zero gate voltage source current	I_{SSS}	V_{SS} =12V,V_{GS} = 0V,			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±8V, V_{SS} = 0V			±10	μA
Gate threshold voltage	$V_{GS(th)}$	V_{SS} =0V,V_{GS}, I_S =1mA	0.55	0.95	1.35	V
Source-source on-resistance	$R_{SS(on)}$	V_{GS} =4.5V, I_S =6A		2.1	2.75	mΩ
		V_{GS} =3.8V, I_S =6A		2.2	2.85	
		V_{GS} =3.1V, I_S =6A		2.4	3.95	
		V_{GS} =2.5V, I_S =6A		3.1	6.1	
Dynamic characteristics[3]						
Input Capacitance	C_{iss}	V_{SS} =0V,V_{GS} =8V,f =1MHz		3500		pF
Output Capacitance	C_{oss}			450		
Reverse Transfer Capacitance	C_{rss}			400		
Total Gate Charge	Q_g	V_{SS} =6V,V_{GS} =4.5V,I_S =4A		23		nC
Gate-Source Charge	Q_{gs}			11		
Gate-Drain Charge	Q_{gd}			5		
Gate Resistance	R_g	f =1MHz		620		Ω
Turn-on delay time	$t_{d(on)}$	V_{SS} =6V,V_{GS}=4.5V, R_L=1.5Ω,R_G=3Ω		0.6		nS
Turn-on rise time	t_r			1.4		
Turn-off delay time	$t_{d(off)}$			6.6		
Turn-off fall time	t_f			4		
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SS}	V_{GS} =0V, I_S=4A			1.2	V
Diode Forward current	I_S				13	A
Diode Pulsed Forward current[1]	I_{SM}				52	A

Notes:

1) Continuous current based on $R_{\theta JA}$

2) Repetitive Rating: Pulse width limited by maximum junction temperature R_G=25ohm,L=0.5mH,I_{AS}=35A

3) Guaranteed by design, not subject to production.

Typical Characteristics

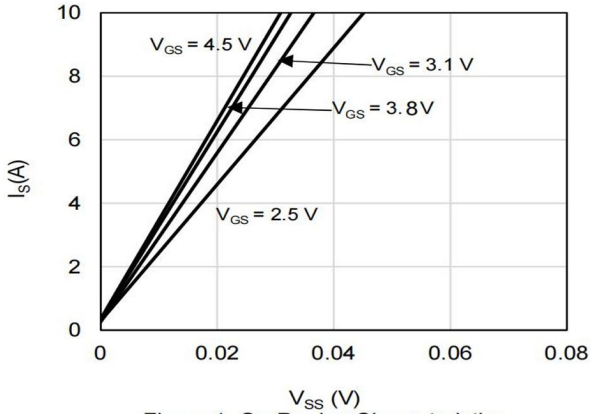


Figure 1: On-Region Characteristics

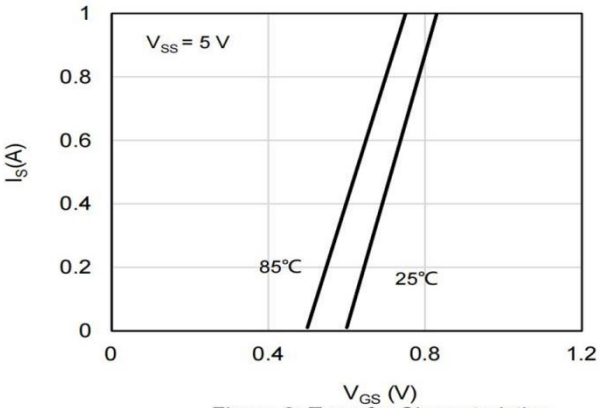


Figure 2: Transfer Characteristics

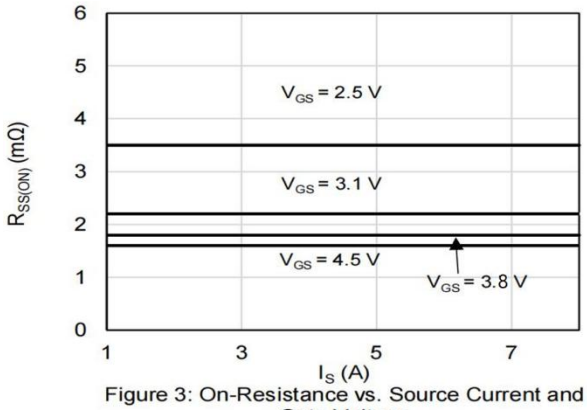


Figure 3: On-Resistance vs. Source Current and Gate Voltage

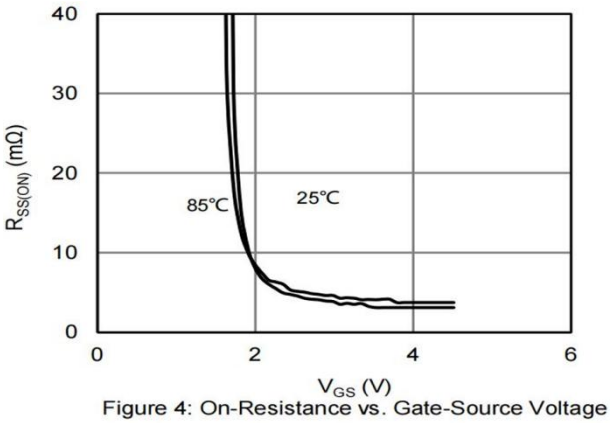


Figure 4: On-Resistance vs. Gate-Source Voltage

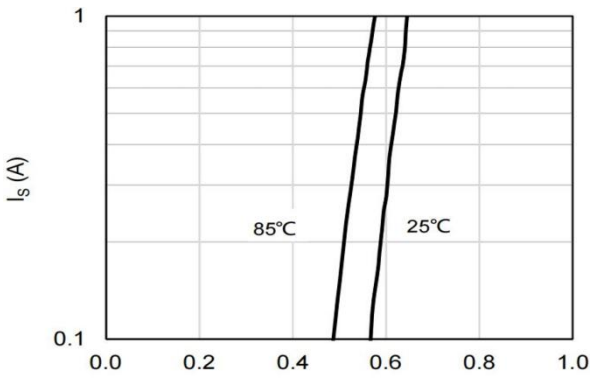


Figure 5: Body-Diode Characteristics

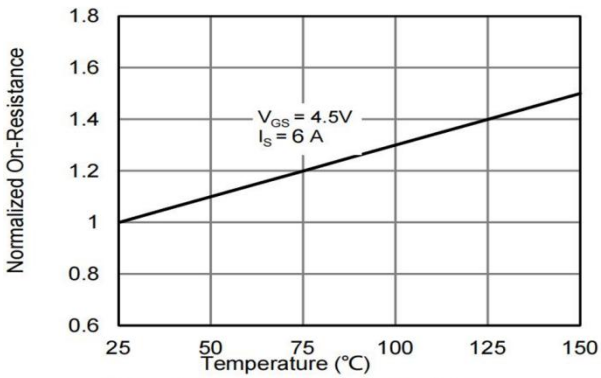


Figure 6: On-Resistance vs. Junction Temperature

Typical Characteristics

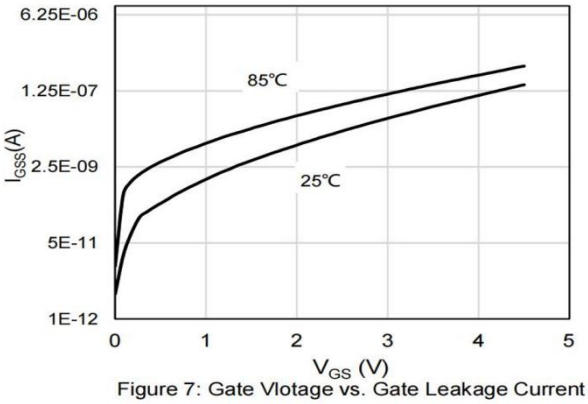


Figure 7: Gate Vlotage vs. Gate Leakage Current

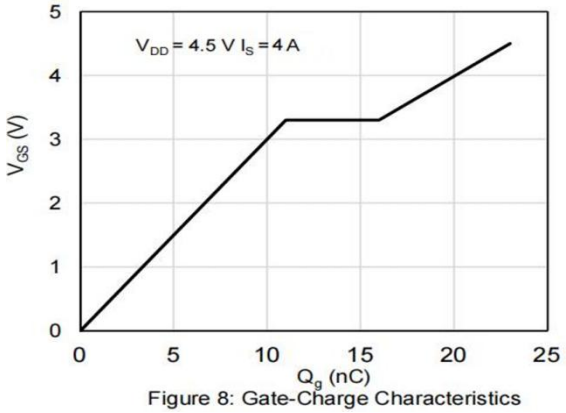


Figure 8: Gate-Charge Characteristics

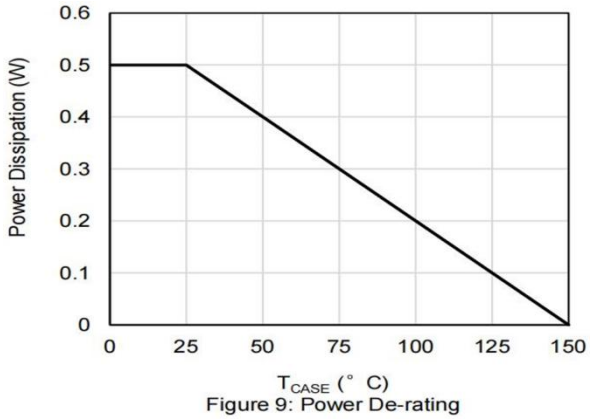


Figure 9: Power De-rating

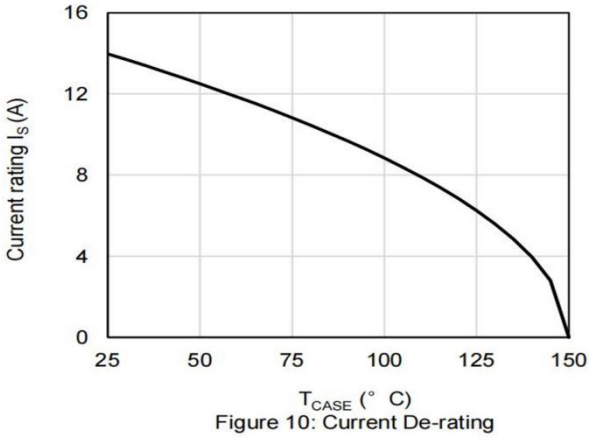


Figure 10: Current De-rating

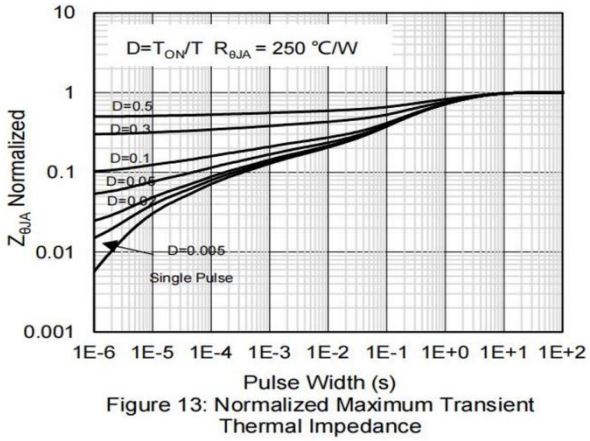


Figure 13: Normalized Maximum Transient Thermal Impedance

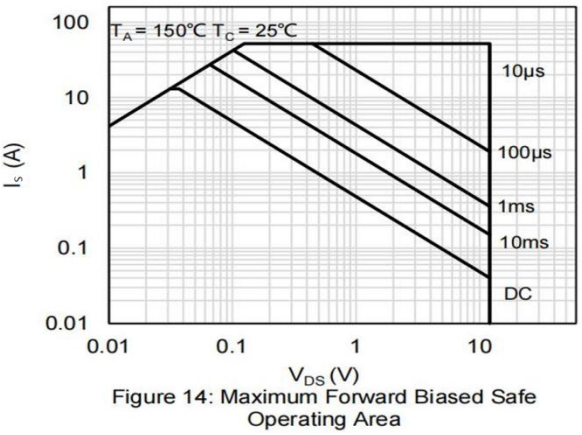
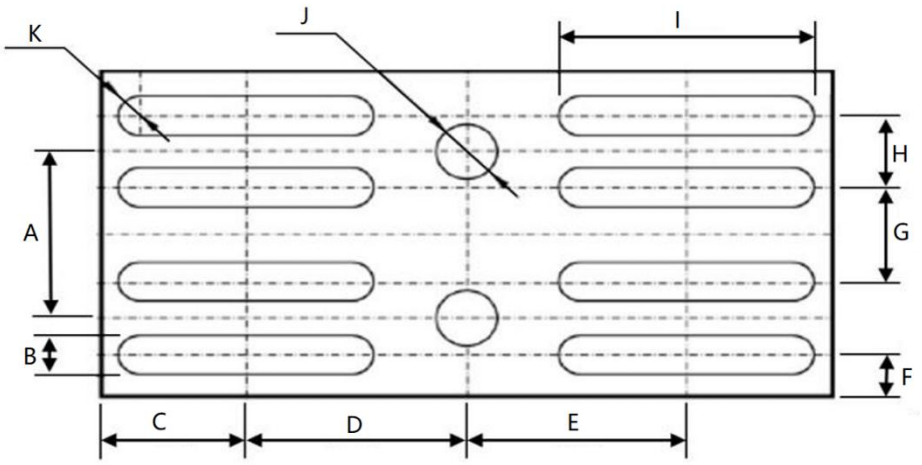


Figure 14: Maximum Forward Biased Safe Operating Area

WLCSP-10L Package Information

Bottom View



Side View

SYMBOL	DIMENSIONS	
	MILLIMETERS	INCHES
A	0.750	0.030
B	0.175	0.007
C	0.605	0.024
D	0.895	0.035
E	0.895	0.035
F	0.218	0.009
G	0.425	0.017
H	0.325	0.013
I	1.040	0.041
J	0.250	0.010
K	0.088	0.003
L	0.100	0.004