

Features ➤ Super Low Gate Charge ➤ Green Device Available ➤ Excellent Cdv/dt effect decline ➤ Advanced high cell density Trench technology	Bvdss	Rdson	ID
	100V	200mΩ	2.5A
	Application ➤ Battery protection ➤ Load Switch ➤ Uninterruptible power supply		

Package Marking and pin assignment SOT23-3L top view Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
3N10	3N10L	SOT23-3L	3000

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current, V _{GS} @10V ¹	I _D @T _A =25°C	2.5	A
Continuous Drain Current, V _{GS} @10V ¹	I _D @T _A =70°C	1.2	A
Pulsed Drain Current ²	I _{DM}	5	A
Total Power Dissipation ³	P _D @T _A =25°C	1	W
Storage Temperature Range	T _{STG}	-55 to 150	°C
Operating Junction Temperature Range	T _J	-55 to 150	°C

Thermal Resistance Ratings

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-ambient ¹	R _{θJA}	--	125	°C/W
Thermal Resistance Junction-Case ¹	R _{θJC}	--	80	°C/W



Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	S	D	
HL3N10L	SOT23-3L	1	2	3	Tape Reel

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{DSS}	V _{GS} =0V,I _D =250μA	100	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V,V _{GS} =0V	-	-	1	μA
Gate- Source Forward Leakage	I _{GSS} (F)	V _{GS} =+20V,V _{DS} =0V	-	-	100	nA
Gate- Source Reverse Leakage	I _{GSS} (R)	V _{GS} =-20V,V _{DS} =0V	-	-	-100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250μA	1.1	1.5	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =2A	-	200	280	mΩ
		V _{GS} =4.5V, I _D =1.5A	-	230	310	
Dynamic Characteristics ⁴						
Input Capacitance	C _{iss}	V _{DS} =50V,V _{GS} =0V, F=1.0MHz	-	440	-	pF
Output Capacitance	C _{oss}		-	14	-	pF
Reverse Transfer Capacitance	C _{rss}		-	10	-	pF
Resistive Switching Characteristics ⁴						
Turn-on Delay Time	T _{d(on)}	V _{DD} =50V,I _D =2A, R _{GEN} =1Ω, V _{GS} =10V	-	14	-	nS
Turn-on Rise Time	t _r		-	54	-	nS
Turn-Off Delay Time	T _{d(off)}		-	18	-	nS
Turn-Off Fall Time	T _f		-	11	-	nS
Total Gate Charge	Q _g	V _{DS} =50V,I _D =2A, V _{GS} =10V	-	5.3	-	nC
Gate-Source Charge	Q _{gs}		-	1.4	-	nC
Gate-Drain Charge	Q _{gd}		-	1.8	-	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage ³	V _{SD}	V _{GS} =0V,I _S =1A	-	-	1.2	V
Maximum Continuous Drain to Source Diode Forward Current	I _S	-	-	-	2.5	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^{\circ}\text{C}$.
2. The data tested by surface mounted on a 1 inch2 FR-4 board with 20Z copper, The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. This value is guaranteed by design hence it is not included in the production test.



Typical Characteristics

Figure 1. Output Characteristics

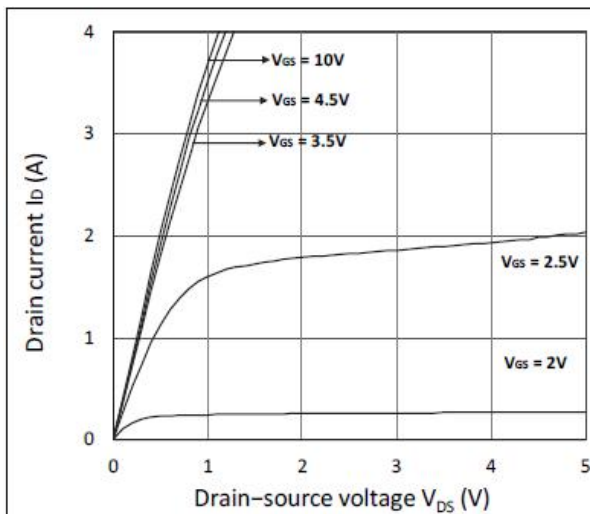


Figure 2. Typical Transfer Characteristics

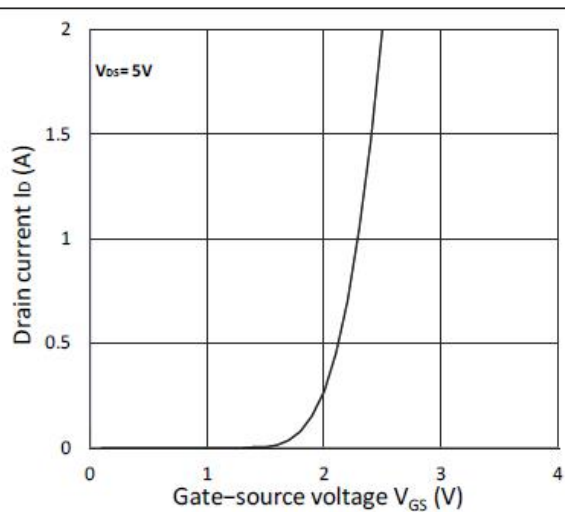


Figure 3. Forward Characteristics of Reverse

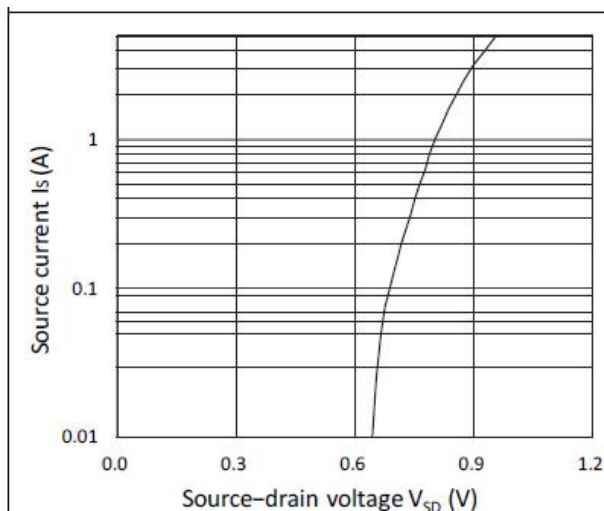
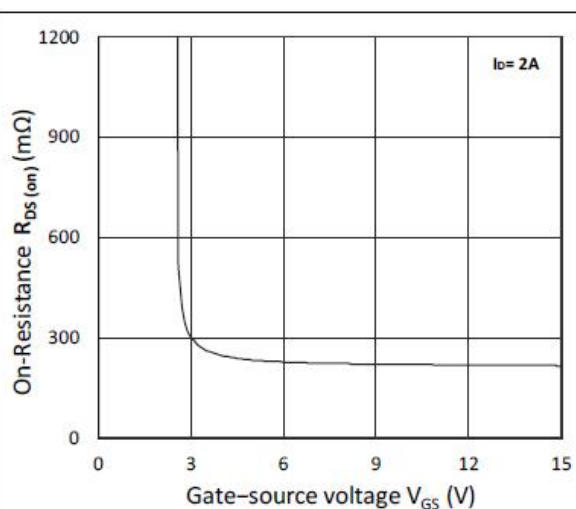
Figure 4. $R_{DS(on)}$ vs. V_{GS} 

Figure 5: Capacitance Characteristics

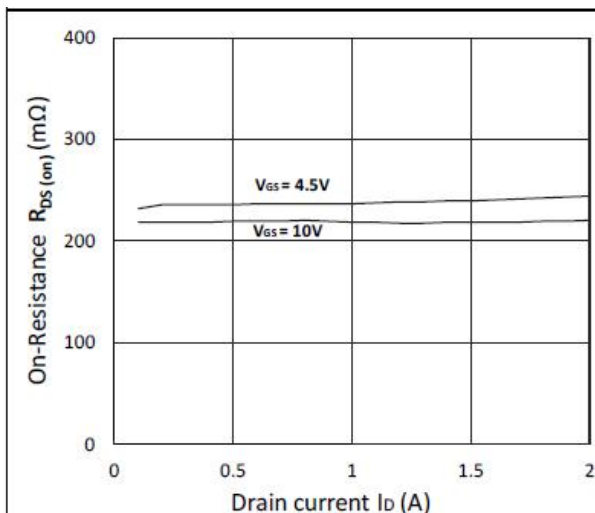


Figure 6: Gate Charge Characteristics

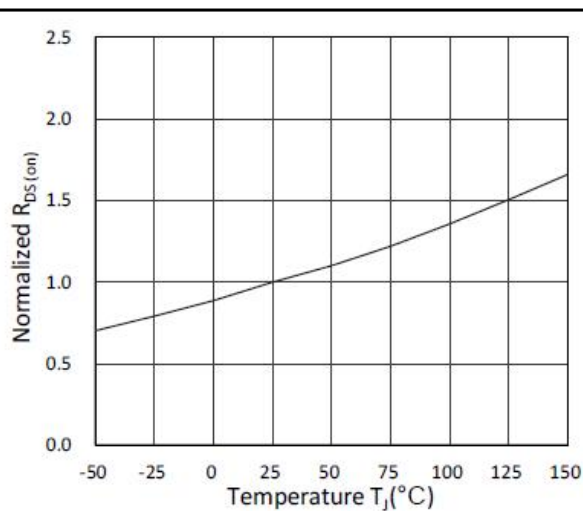
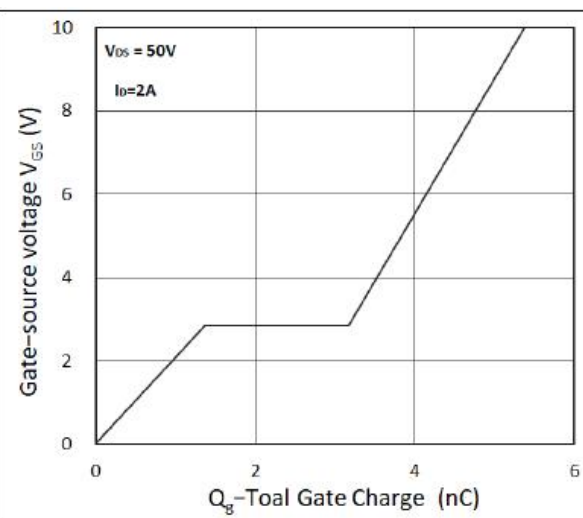
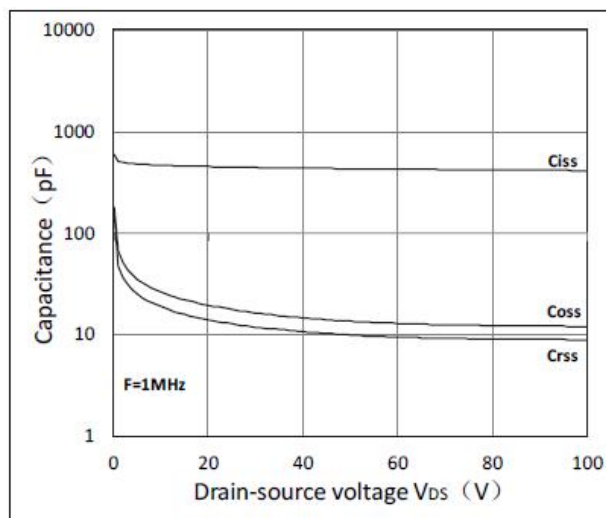
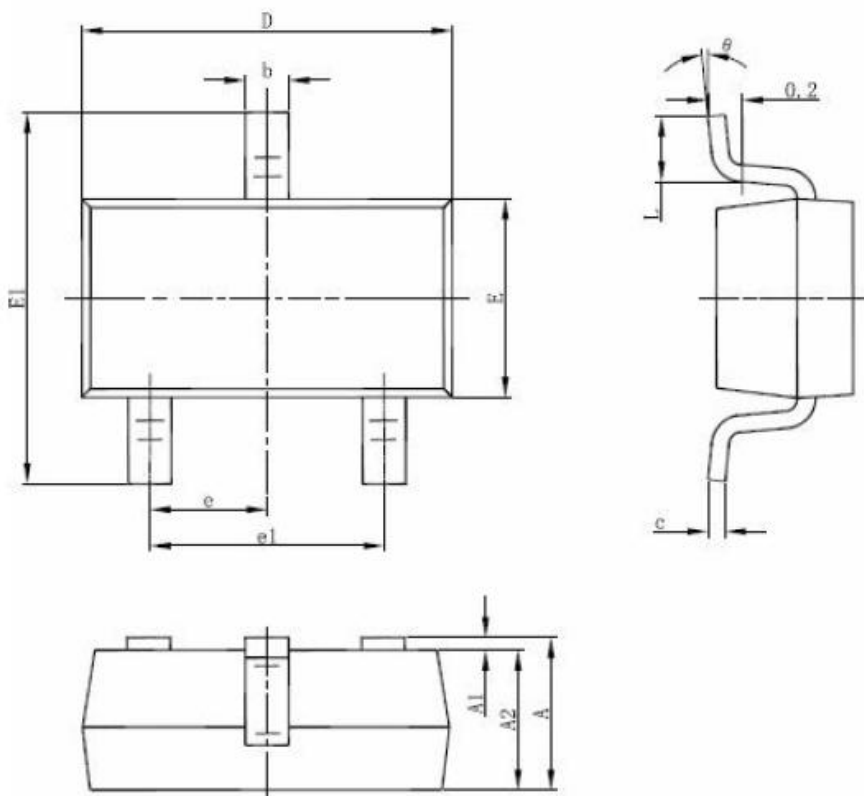


Figure 7: Capacitance Characteristics

Figure 8: Gate Charge Characteristics



Package Dimensions SOT23-3L


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°



Important Notice and Disclaimer

HL Microelectronics reserves the right to make changes to this document and its products and specifications at any time without notice.

Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

HL Microelectronics makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, not does HL Microelectronics assume any liability for application assistance or customer product design.

HL Microelectronics does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

No license is granted by implication or otherwise under any intellectual property rights of HL Microelectronics.

HL Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of HL Microelectronics.