Features

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

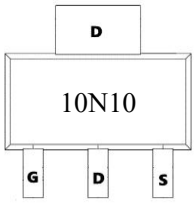
Bvdss	Rdson	ID
100V	85mΩ	10A

Application

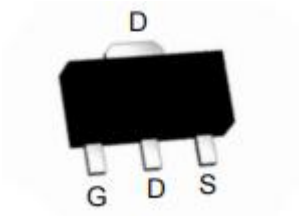
- PWM applications
- Load Switch
- Power management

RoHS

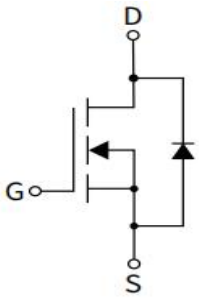
Package



Marking and pin assignment



SOT89-3L top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
10N10	10N10Q	SOT89-3L	1000

Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

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]	T_C= 25℃	I_D	10	A
	T_C=100℃		7	A
Pulsed Drain Current[2]		I_{DM}	24	A
Single Pulse Avalanche Energy[3]		EAS	6.1	mJ
Avalanche Current		I_{AS}	10	A
Total Power Dissipation[3]	T_C= 25℃	P_D	34.7	W
	T_A= 25℃		2	
Storage Temperature Range		T_{STG}	-55 ~ +150	℃
Operating Junction Temperature Range		T_J	-55 ~ +150	℃

Thermal Resistance Ratings

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-ambient[1]	$R_{\theta JA}$	-	62	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	-	3.6	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL10N10Q	SOT89-3L	1	2	3	Tape Reel

Electrical Characteristics (T_j=25℃unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250uA	100	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=80V,V_{GS}=0V,T_J=25℃	-	-	1	uA
		V_{DS}=80V,V_{GS}=0V,T_J=55℃	-	-	5	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	1	-	2.5	V
Static Drain-Source On-Resistance[2]	$R_{DS(on)}$	V_{GS}=10V, I_D=10A	-	85	112	mΩ
		V_{GS}=4.5V,I_D=8A	-	105	120	
Forward Transconductance	gfs	V_{DS}=5V,I_D=10A	-	13	-	S
Gate resistance	R_g	V_{DS}=0V,V_{GS}=0V,f=1MHz	-	2	-	Ω
Total Gate Charge	Q_g	V_{GS}=80V,V_{DS}=10V,I_D=10A	-	26.2	-	nC
Gate-Source Charge	Q_{gs}		-	4.6	-	
Gate-Drain Charge	Q_{gd}		-	5.1	-	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=50V,V_{GS}=10V, R_G=3.3Ω, I_D=10A	-	4.2	-	ns
Turn-On Rise Time	T_r		-	8.2	-	
Turn-Off Delay Time	$T_{d(off)}$		-	35.6	-	
Turn-Off Fall Time	T_f		-	9.6	-	
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V, f=1MHz	-	1535	-	pF
Output Capacitance	C_{oss}		-	60	-	
Reverse Transfer Capacitance	C_{rss}		-	37	-	
Continuous Source Current[1,5]	I_S	V_G=V_D=0,Force Current	-	-	10	A
Pulsed Source Current[2,5]	I_{SM}		-	-	20	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V,I_S=1A,T_J=25℃	-	-	1.2	V

Reverse Recovery Time	t_{rr}	IF=10A,di/dt=100A/μs,T_J=25℃	-	37	-	nS
Reverse Recovery Charge	Q_{rr}		-	27.3	-	nC

Notes:

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.

3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=11A.

4.The power dissipation is limited by 150℃ junction temperature.

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Performance Characteristics

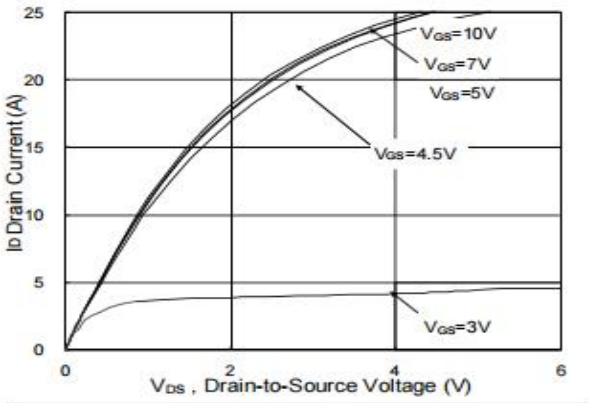


Fig.1 Typical Output Characteristics

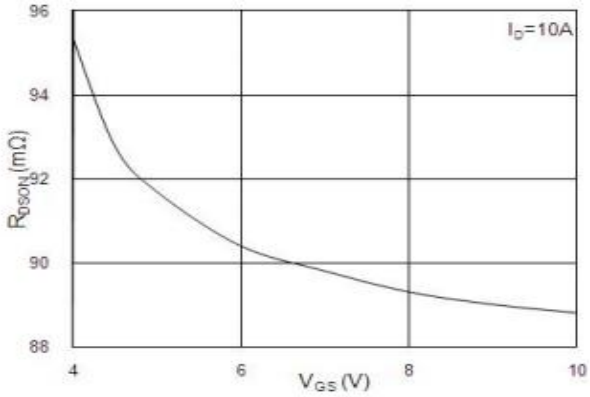


Fig.2 On-Resistance vs. Gate-Source

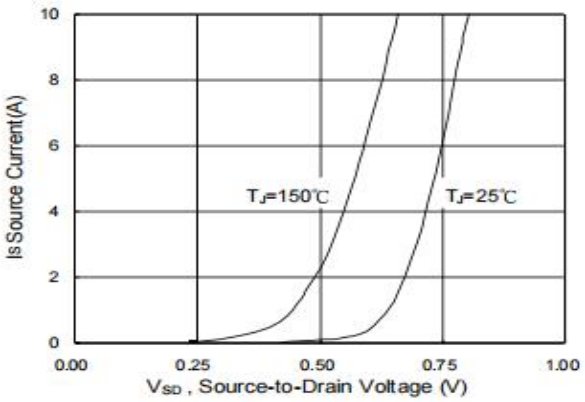


Fig.3 Forward Characteristics Of Reverse

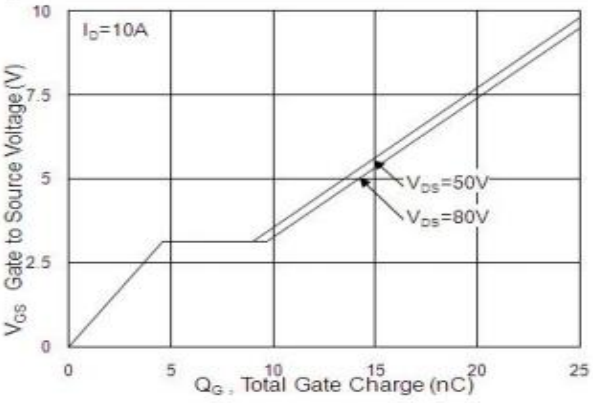


Fig.4 Gate-Charge Characteristics

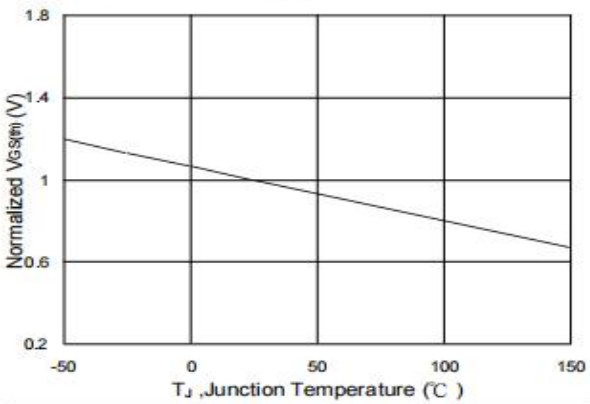


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

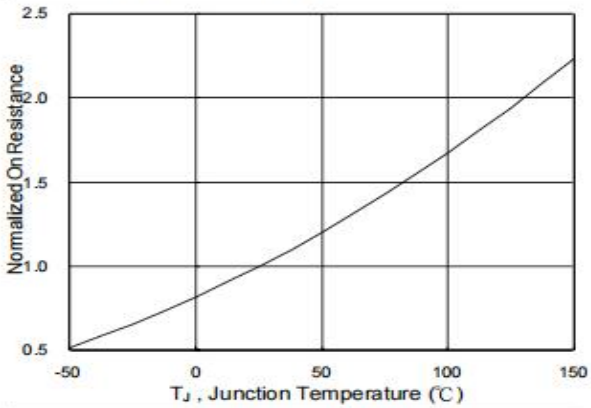


Fig.6 Normalized R_{DSON} vs. T_J

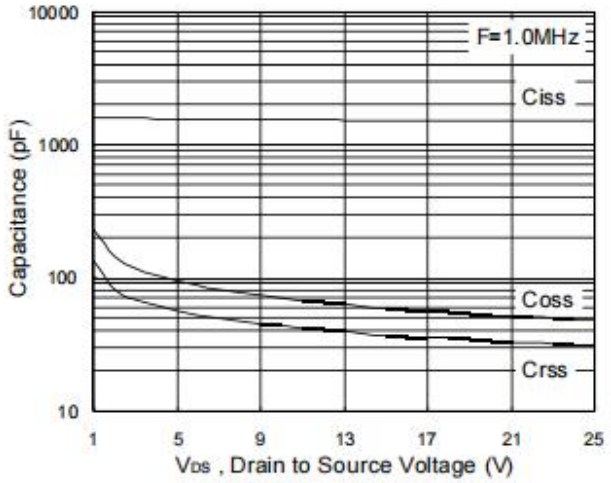


Fig.7 Capacitance

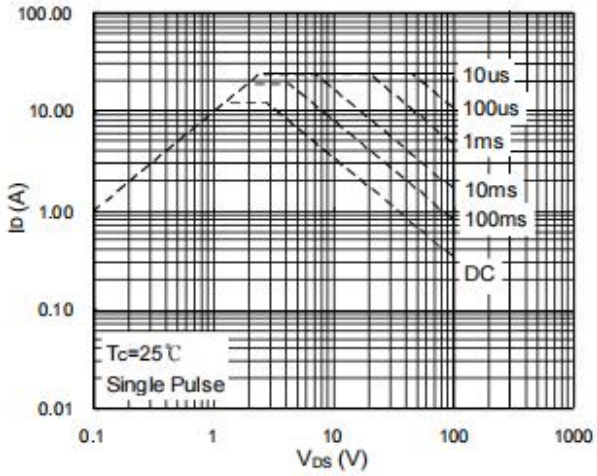


Fig.8 Safe Operating Area

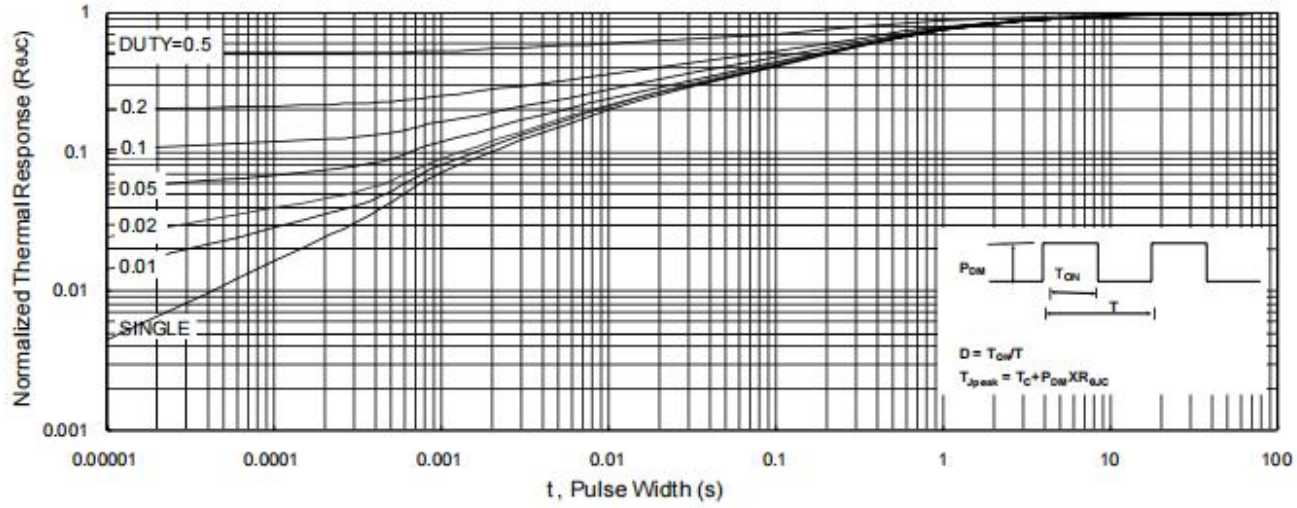


Fig.9 Normalized Maximum Transient Thermal Impedance

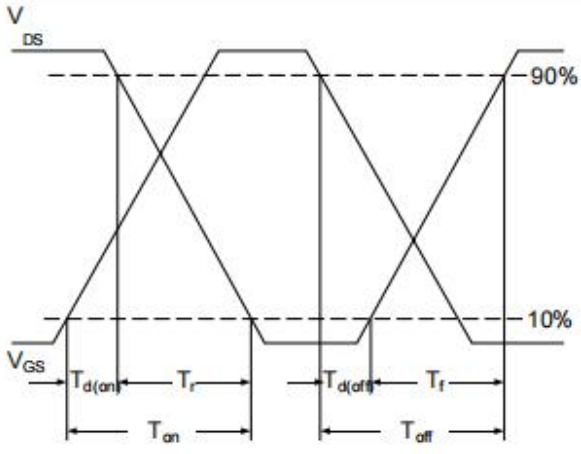


Fig.10 Switching Time Waveform

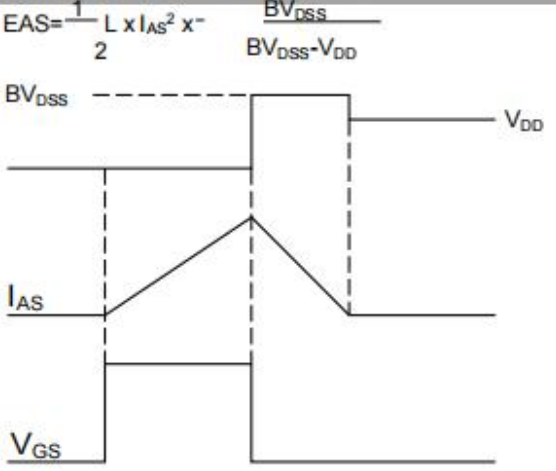
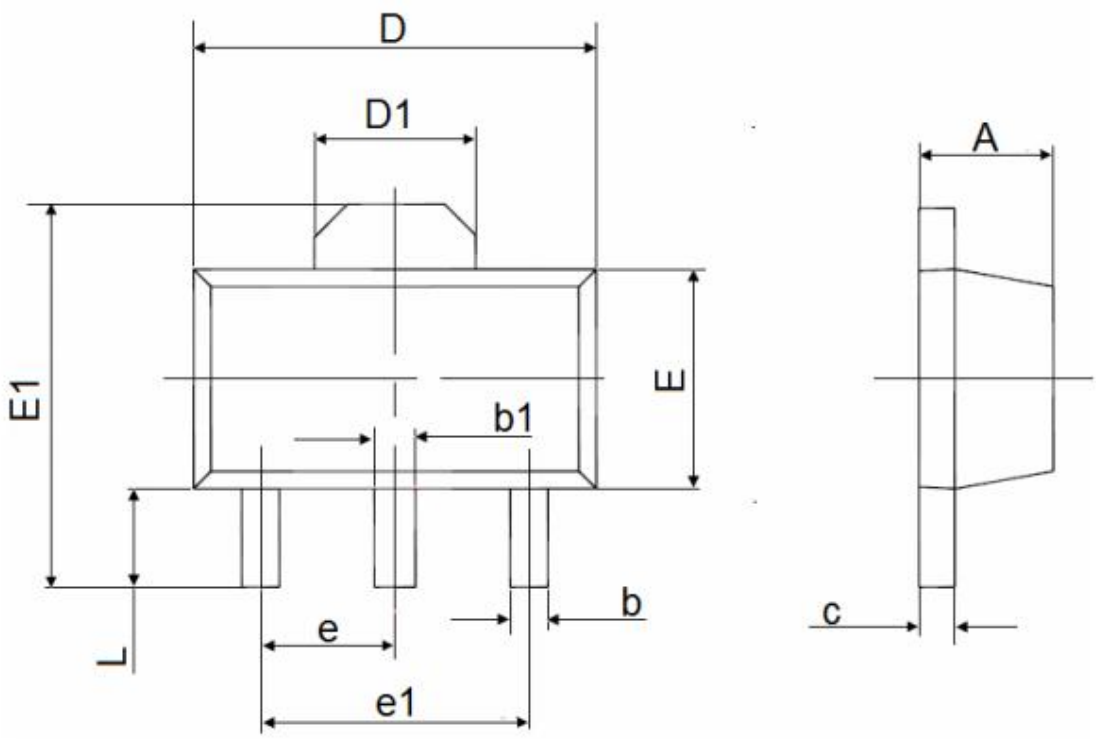


Fig.11 Unclamped Inductive Switching Waveform

Package Dimensions SOT89-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

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