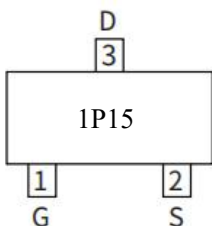


Features ➤ Super Low Gate Charge ➤ Green Device Available ➤ Advanced high cell density Trench technology	<i>Bvdss</i>	<i>Rdson</i>	<i>ID</i>
	-150V	650mΩ	-1.2A
	Application ➤ Battery protection ➤ Load Switch ➤ Uninterruptible power supply		

RoHS

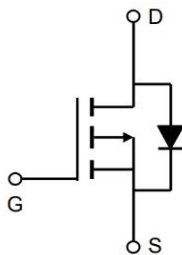
Package



Marking and pin assignment



SOT23-3L top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
1P15	1P15L	SOT23-3L	3000

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $V_{GS}@-10V^1$	$I_D@T_A=25^{\circ}\text{C}$	-1.2	A
	$I_D@T_A=70^{\circ}\text{C}$	-0.88	A
Pulsed Drain Current ²	I_{DM}	-4.4	A
Single Pulsed Avalanche Energy ³	EAS	12.5	mJ
Total Power Dissipation ⁴	$P_D@T_A=25^{\circ}\text{C}$	2	W
Storage Temperature Range	T_{STG}	-55 ~ 150	$^{\circ}\text{C}$
Operating Junction Temperature Range	T_J	-55 ~ 150	$^{\circ}\text{C}$

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	62	$^{\circ}\text{C/W}$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	40	$^{\circ}\text{C/W}$



Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	S	D	
HL1P15L	SOT23-3L	1	2	3	Tape Reel

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-150	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-120V, V_{GS}=0V$	-	-	-1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2	-3	-4	V
Static Drain-Source On-Resistance ²	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-1A$	-	650	780	m Ω
		$V_{GS}=-6V, I_D=-0.5A$	-	700	980	
Gate Resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	-	12	-	Ω
Input Capacitance	C_{iss}	$V_{DS}=-75V, V_{GS}=0V, f=1MHz$	-	706	-	pF
Output Capacitance	C_{oss}		-	23	-	
Reverse Transfer Capacitance	C_{rss}		-	13	-	
Total Gate Charge	Q_g	$V_{DS}=-75V, V_{GS}=-10V, I_D=-1A$	-	10.8	-	nC
Gate-Source Charge	Q_{gs}		-	3.1	-	
Gate-Drain Charge	Q_{gd}		-	2.2	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=-10V, V_{DD}=-30V, R_G=6\Omega, I_D=-1A$	-	21	-	ns
Rise Time	t_r		-	16	-	
Turn-off Delay Time	$t_{d(off)}$		-	40	-	
Fall Time	t_f		-	18	-	
Continuous Source Current ^{1,5}	I_S	$V_G=V_D=0V$, Force Current	-	-	-1.2	A
Drain to Source Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=-1A, T_J=25^{\circ}\text{C}$	-	-	-1.2	V
Reverse Recovery Time	t_{rr}	-	-	-	-	nS
Reverse Recovery Charge	Q_{rr}		-	-	-	nC

Notes:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=-50V, V_{GS}=-10V, L=1mH, I_{AS}=-5A$
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Performance Characteristics

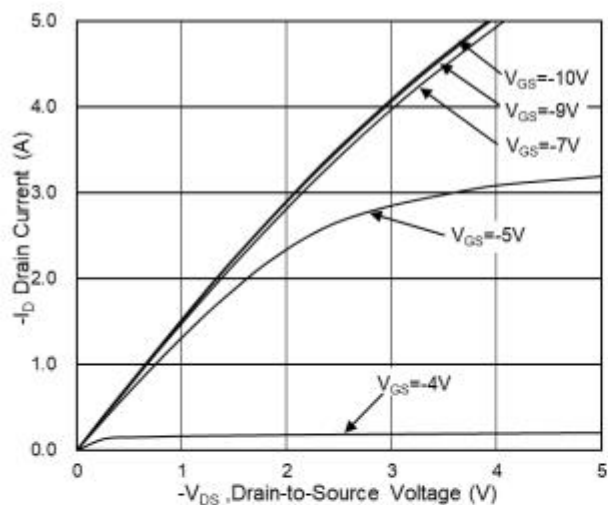


Fig.1 Typical Output Characteristics

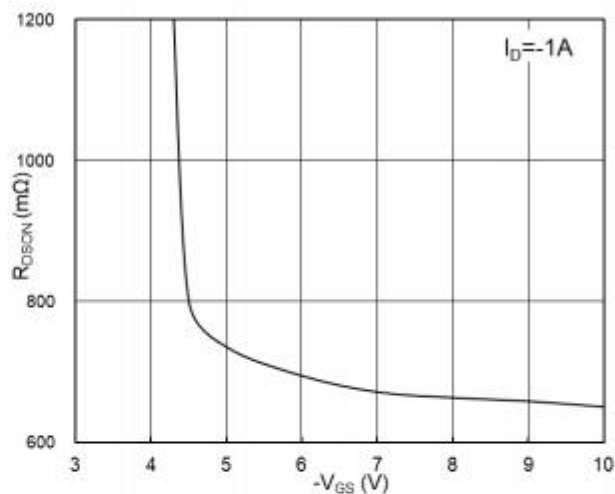


Fig.2 On-Resistance vs G-S Voltage

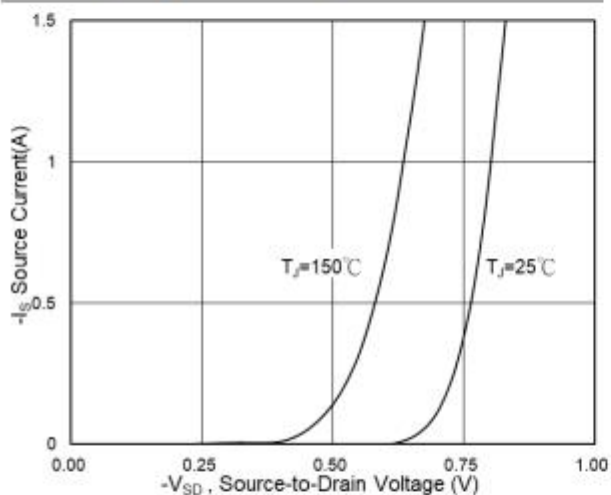


Fig.3 Source Drain Forward Characteristics

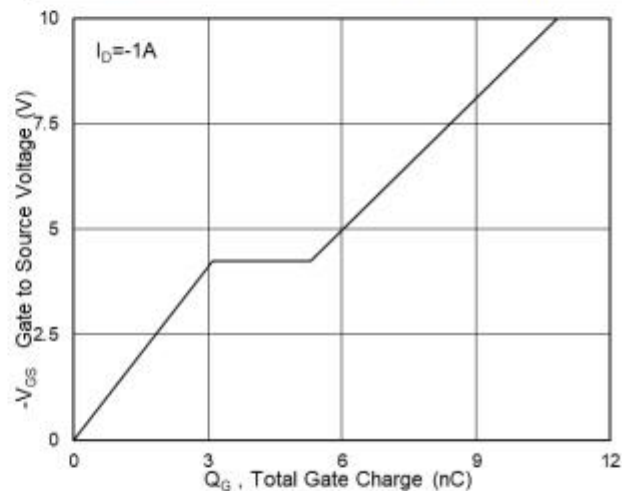


Fig.4 Gate-Charge Characteristics

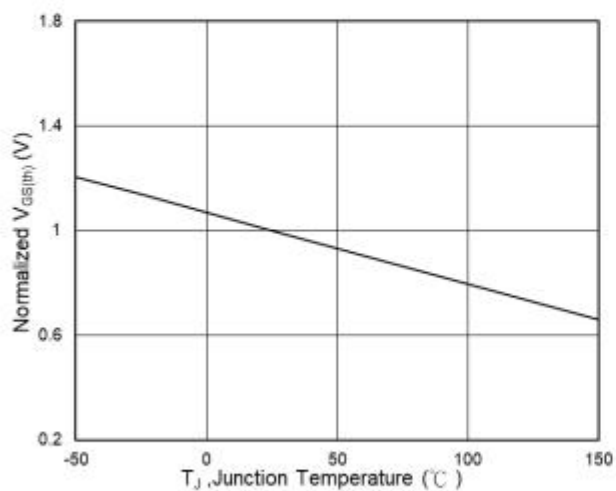


Fig.5 Normalized $V_{GS(th)}$ vs T_J

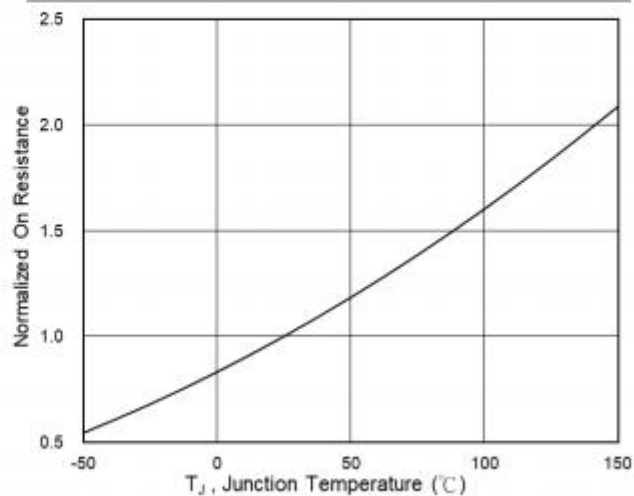


Fig.6 Normalized $R_{DS(on)}$ vs T_J

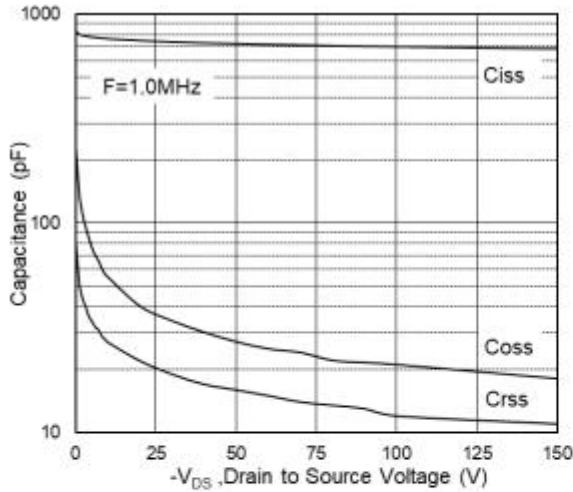


Fig.7 Capacitance

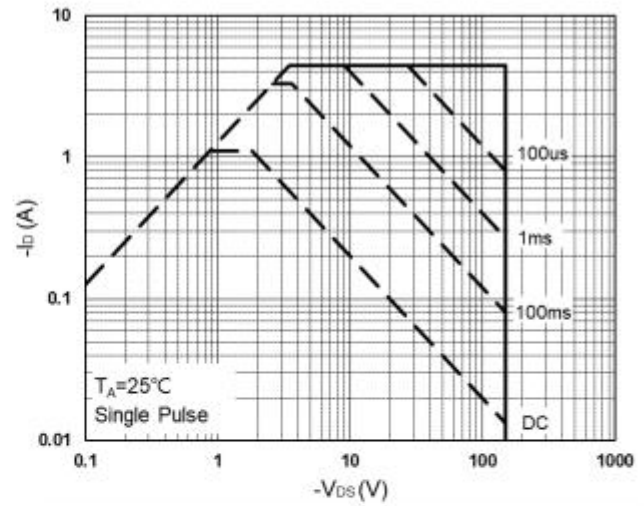


Fig.8 Safe Operating Area

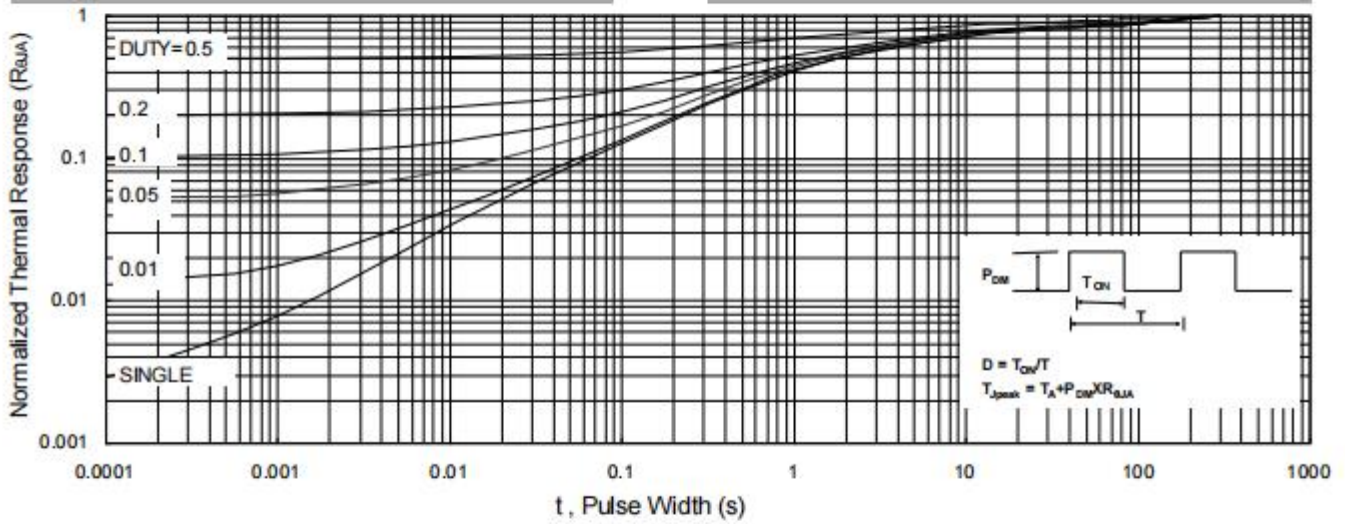


Fig.9 Normalized Maximum Transient Thermal Impedance

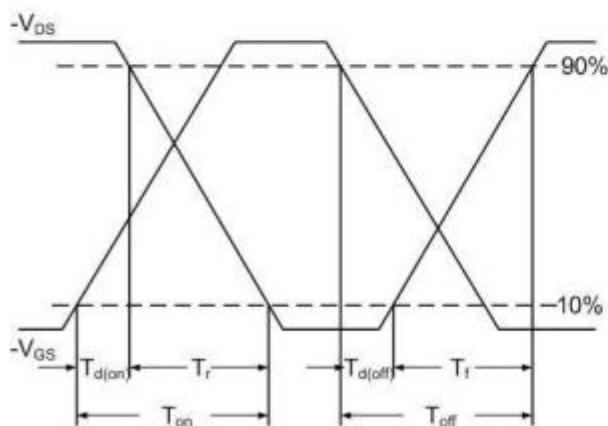


Fig.10 Switching Time Waveform

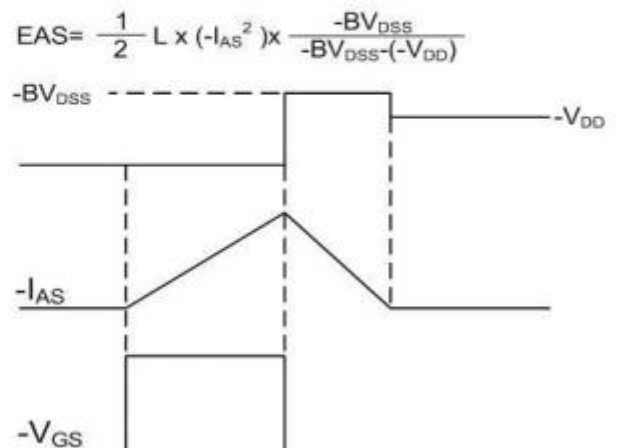
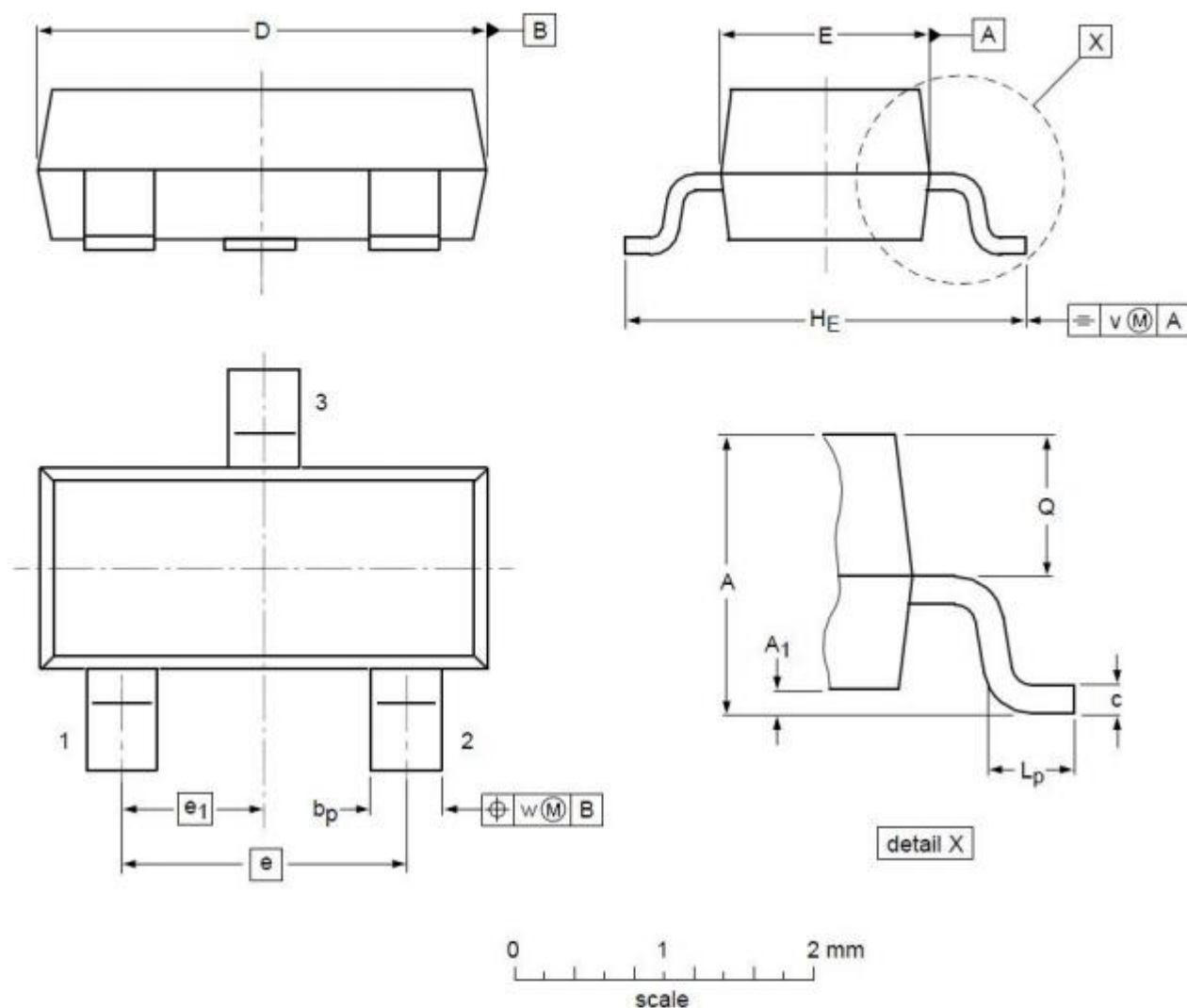


Fig.11 Unclamped Inductive Waveform

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°



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