Features

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

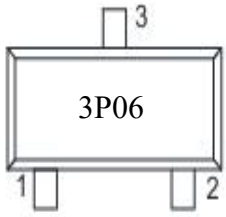
Bvdss	Rdson	ID
-60V	115mΩ	-3A

RoHS

Application

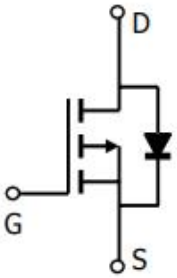
- PWM applications
- Load Switch
- Power management

Package



1.Marking and pin assignment

2. SOT23-3L top view



3.Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
3P06	3P06L	SOT23-3L	3000

Absolute Maximum Ratings (T_C=25℃unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current,V_{GS} @ 10V[1]	I_D@T_A =25℃	-3	A
	I_D@T_A =70℃	-2.4	A
Pulsed Drain Current[2]	I_{DM}	-6	A
Single Pulsed Avalanche Energy[3]	E_{AS}	20	mJ
Avalanche Current	I_{AS}	-20	A
Total Power Dissipation	P_D@T_A =25℃	1.5	W
Junction Temperature Range	T_J	-55~+150	℃
Storage Temperature Range	T_{STG}	-55~+150	℃

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	50	℃/W

Thermal Resistance Junction-Ambient[1]	$R_{\theta JA}$	85	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL3P06L	SOT23-3L	1	2	3	Tape Reel

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=-250uA	-60	-	-	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃ , I_D=-1mA	-	-0.049	-	V/℃
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-3A	-	115	140	mΩ
		V_{GS}=-4.5V , I_D=-2A	-	-	190	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =-250uA	-1.0	-	-2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		-	5.42	-	mV/℃
Drain-Source Leakage Curren	I_{DSS}	V_{DS}=-48V , V_{GS}=0V , T_J=25℃	-	-	1	uA
		V_{DS}=-48V ,V_{GS}=0V , T_J=150℃	-	-	5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	-	-	±100	nA
Forward Transconductance	gfs	V_{DS}=-5V , I_D=-3A	-	5.8	-	S
Total Gate Charge (-4.5V)	Q_g	V_{DS}=-20V , V_{GS}=-4.5V , I_D=-3A	-	5.9	-	nC
Gate-Source Charge	Q_{gs}		-	2.9	-	
Gate-Drain Charge	Q_{gd}		-	1.8	-	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-12V , V_{GS}=-10V ,R_G=3.3Ω , I_D=-3A	-	10	-	ns
Rise Time	T_r		-	17	-	
Turn-Off Delay Time	$T_{d(off)}$		-	22	-	
Fall Time	T_f		-	21	-	
Input Capacitance	C_{iss}	V_{DS}=-15V , V_{GS}=0V , F=1MHz	-	715	-	pF
Output Capacitance	C_{oss}		-	51	-	
Reverse Transfer Capacitance	C_{rss}		-	34	-	

Diode Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Continuous Source Current [1,6]	I_S	V_G=V_D=0V , Force Current	-	-	-3	A
Pulsed Source Current [2,6]	I_{SM}		-	-	-6	

Diode Forward Voltage [2]	V_{SD}	V_{GS}=0V , I_S=-1A , T_J=25℃	-	-	-1.2	V

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 ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.5mH,I_{AS}=-20A

4.The power dissipation is limited by 150℃ 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 Characteristics

Fig.1 Typical Output Characteristics

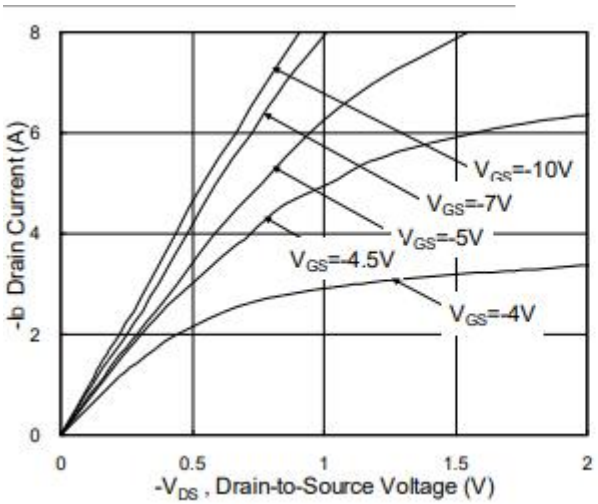


Fig.2 On-Resistance vs. G-S Voltage

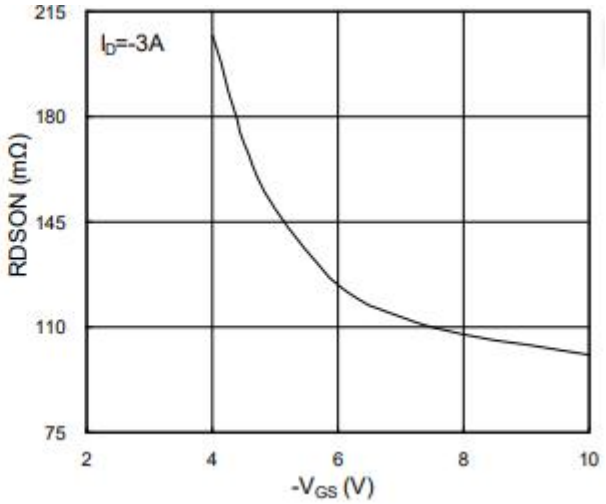


Fig.3 Forward Characteristics Of Reverse

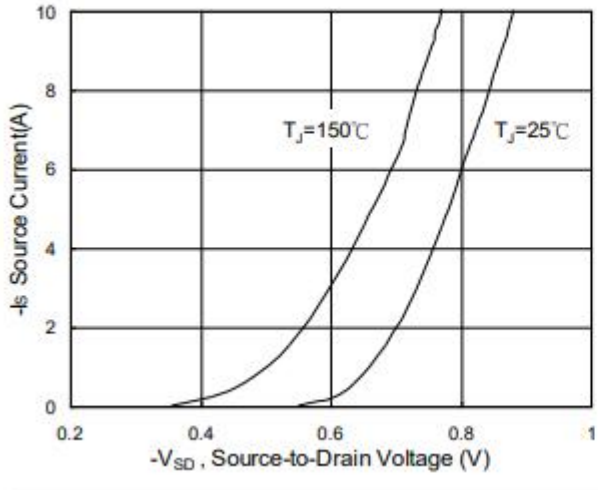


Fig.4 Gate-Charge Characteristics

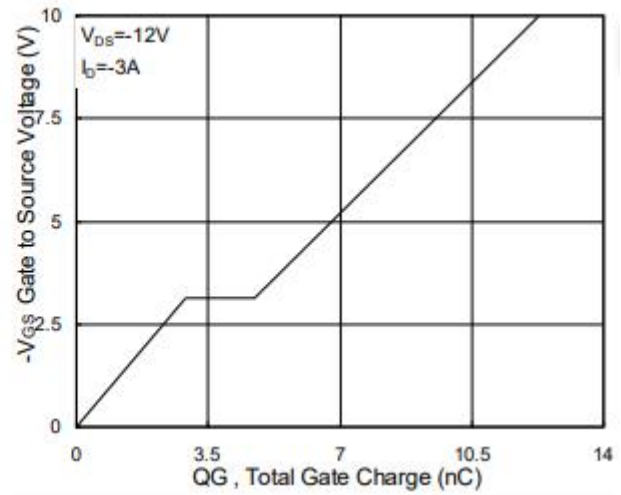


Fig.5 Normalized VGS(th) vs. T_J

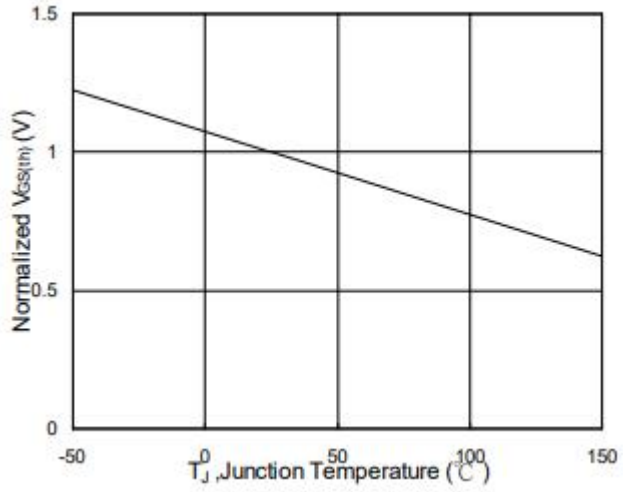


Fig.6 Normalized RDSON vs. T_J

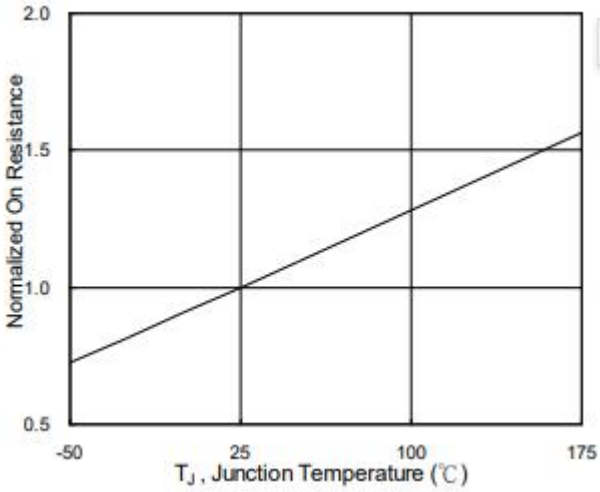


Fig.7 Capacitance

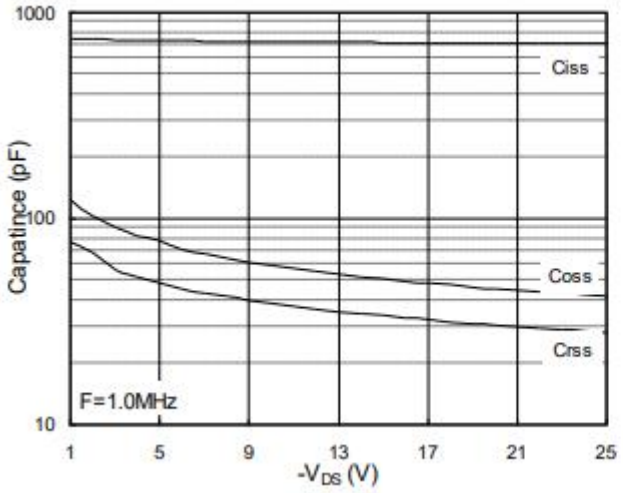


Fig.8 Safe Operating Area

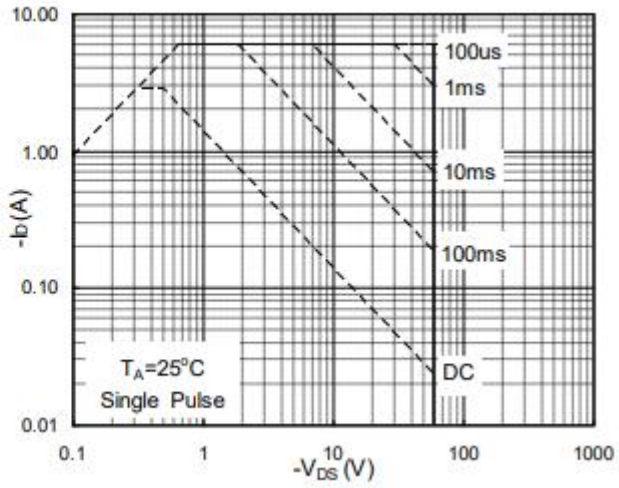


Fig.9 Normalized Maximum Transient Thermal Impedance

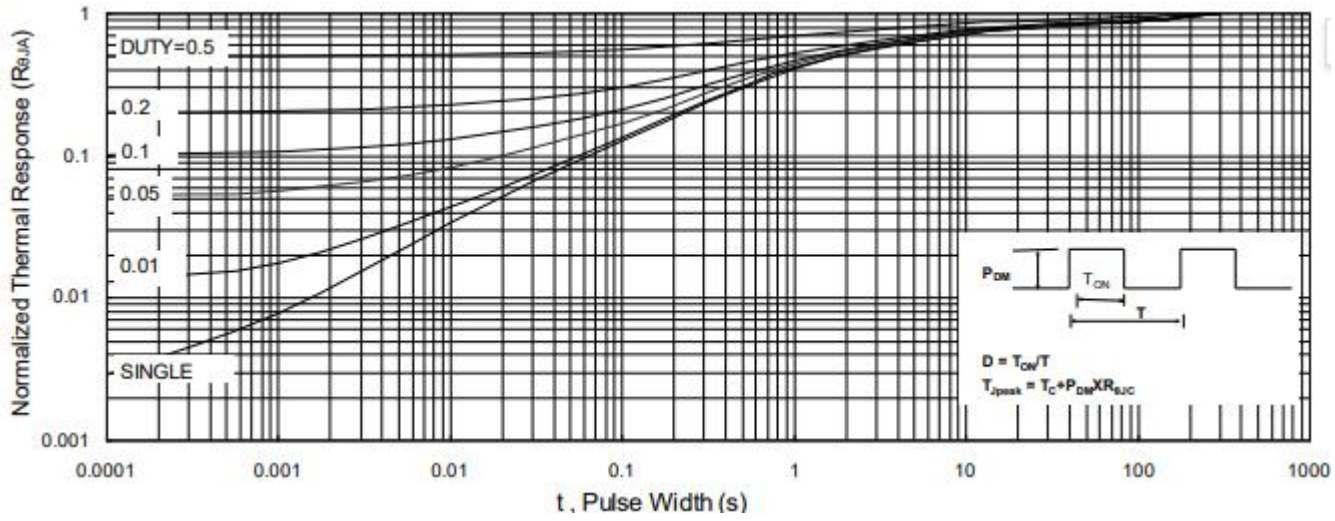


Fig.10 Switching Time Waveform

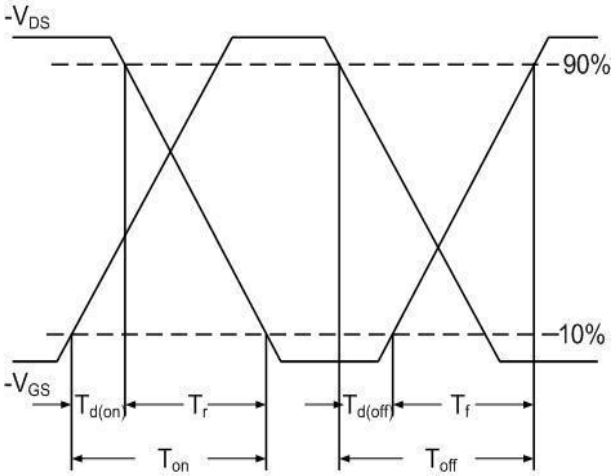
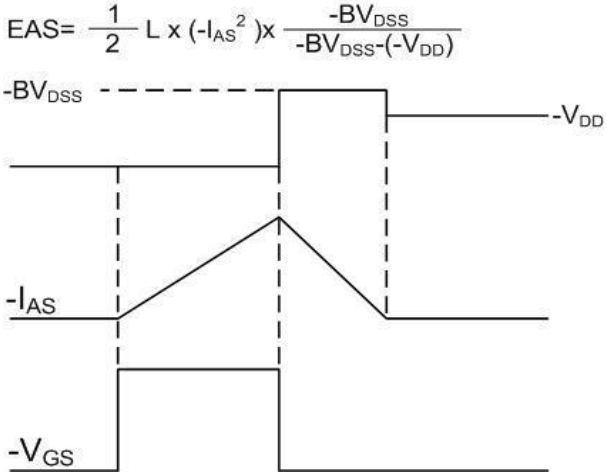
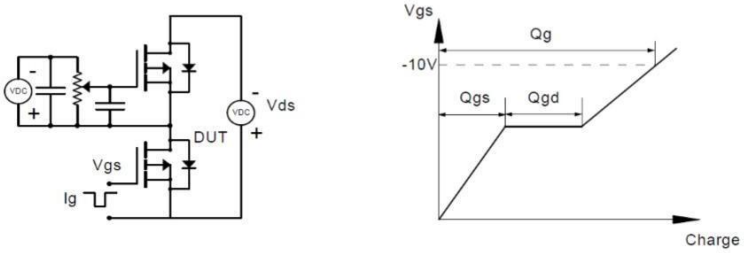


Fig.11 Unclamped Inductive Waveform

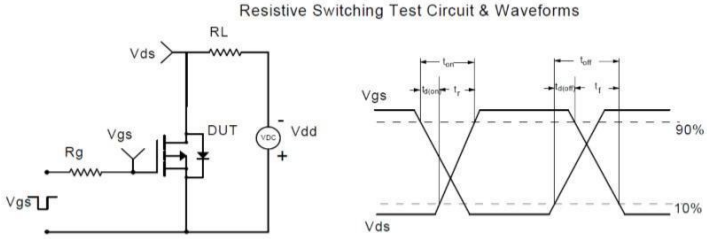


Test Circuit

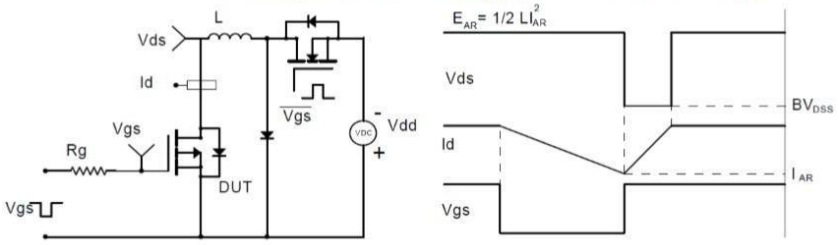
Gate Charge Test Circuit & Waveform



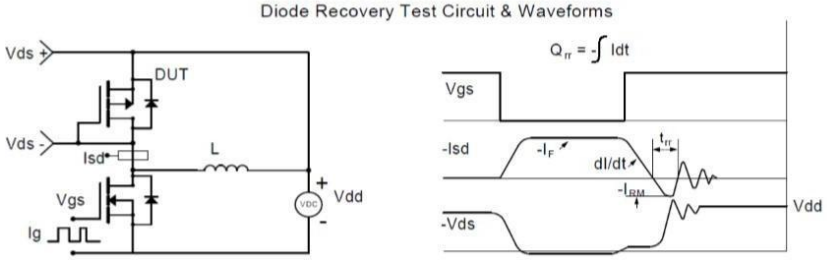
Resistive Switching Test Circuit & Waveforms



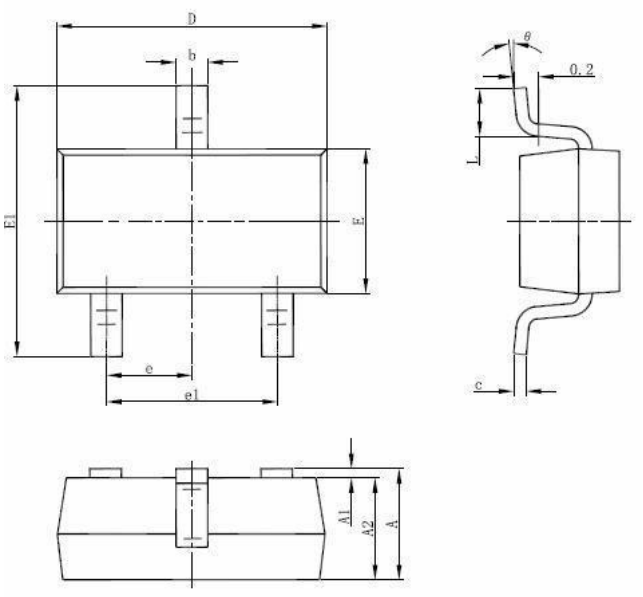
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



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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