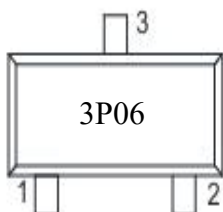


Features	<i>Bvdss</i>	<i>Rdson</i>	<i>ID</i>
	-60V	115mΩ	-3A
➤ Super Low Gate Charge ➤ Green Device Available ➤ Excellent Cdv/dt effect decline ➤ Advanced high cell density Trench technology ➤ 100% EAS Guaranteed	Application ➤ PWM applications ➤ Load Switch ➤ Power management		

RoHS

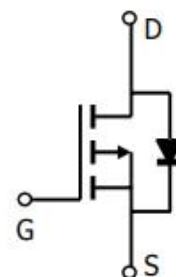
Package



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°C 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°C	-3	A
	I _D @T _A =70°C	-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°C	1.5	W
Junction Temperature Range	T _J	-55~+150	°C
Storage Temperature Range	T _{STG}	-55~+150	°C

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Case ¹	R _{θJC}	50	°C/W



Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	85	°C/W
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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°C 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	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Reference to 25°C, I _D =-1mA	-	-0.049	-	V/°C
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	$\Delta V_{GS(th)}$		-	5.42	-	mV/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-48V, V _{GS} =0V, T _J =25°C	-	-	1	uA
		V _{DS} =-48V, V _{GS} =0V, T _J =150°C	-	-	5	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Forward Transconductance	g _{fs}	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}	$V_{GS}=0V, I_S=-1A, T_J=25^{\circ}C$	-	-	-1.2	V
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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 $V_{DD}=-25V, V_{GS}=-10V, L=0.5mH, I_{AS}=-20A$
- 4.The power dissipation is limited by $150^{\circ}C$ 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 Characteristics

Fig.1 Typical Output Characteristics

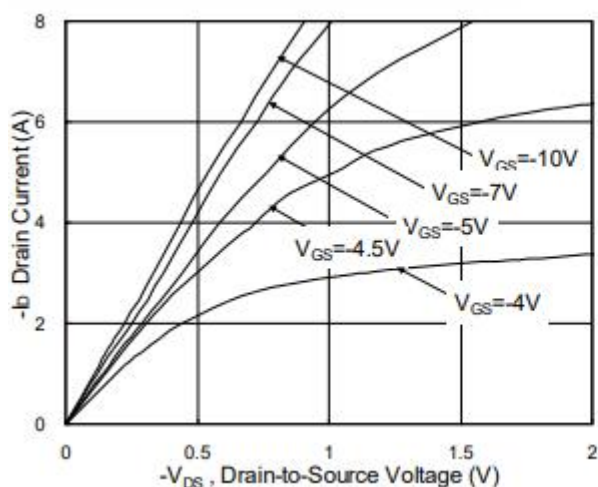


Fig.2 On-Resistance vs. G-S Voltage

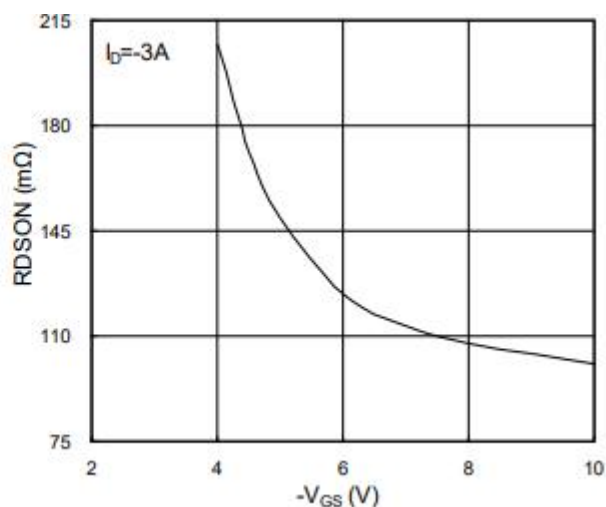


Fig.3 Forward Characteristics Of Reverse

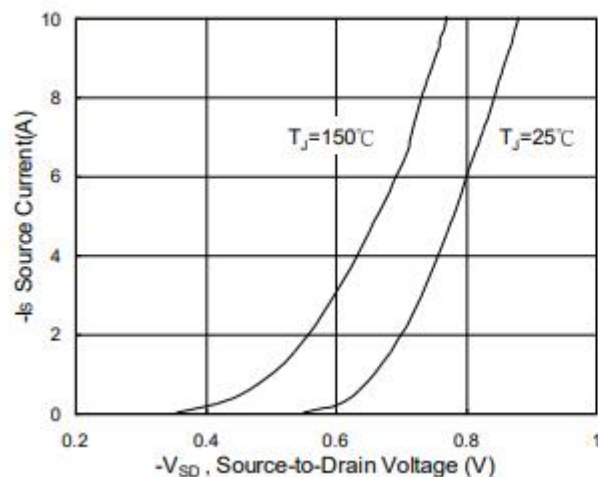


Fig.4 Gate-Charge Characteristics

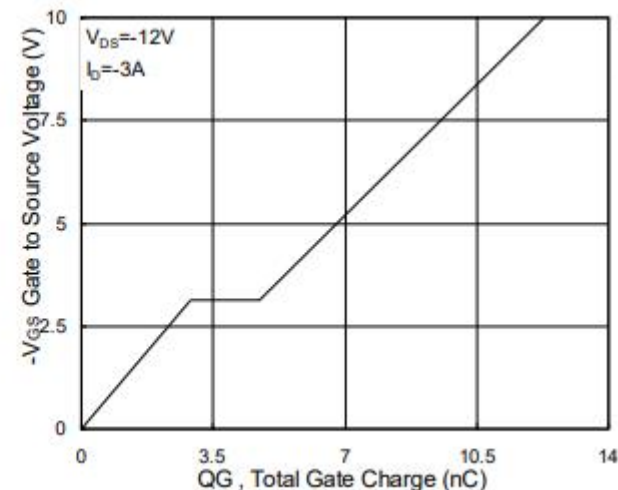


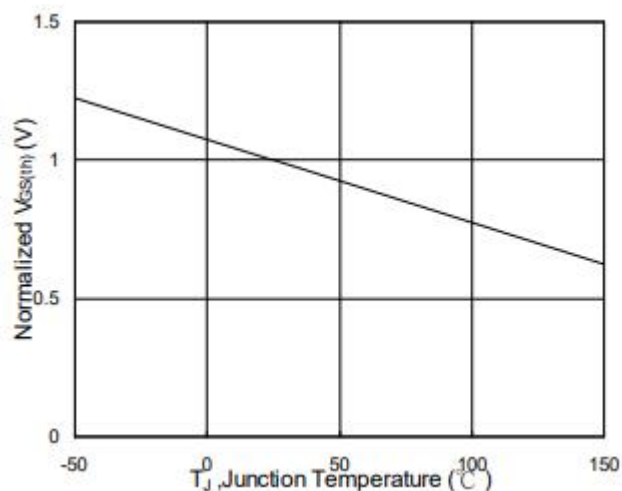
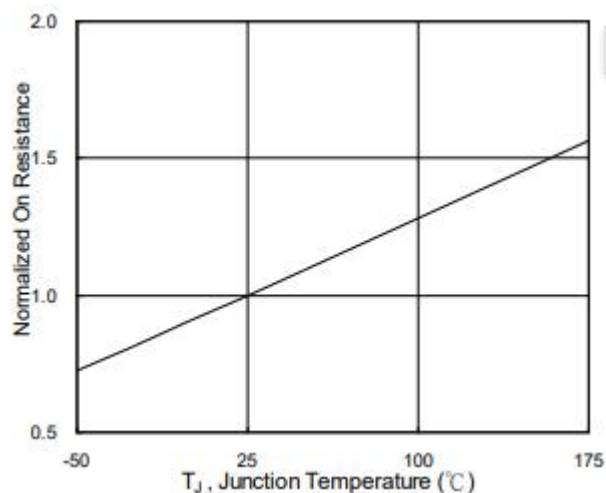
Fig.5 Normalized VGS(th) vs. T_J

Fig.6 Normalized RDSON vs. T_J


Fig.7 Capacitance

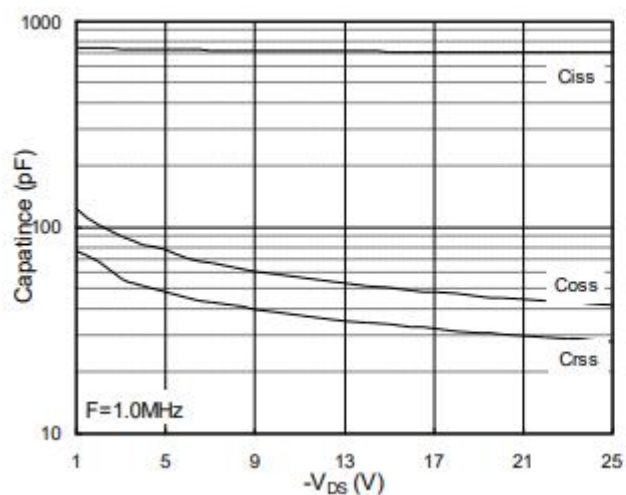


Fig.8 Safe Operating Area

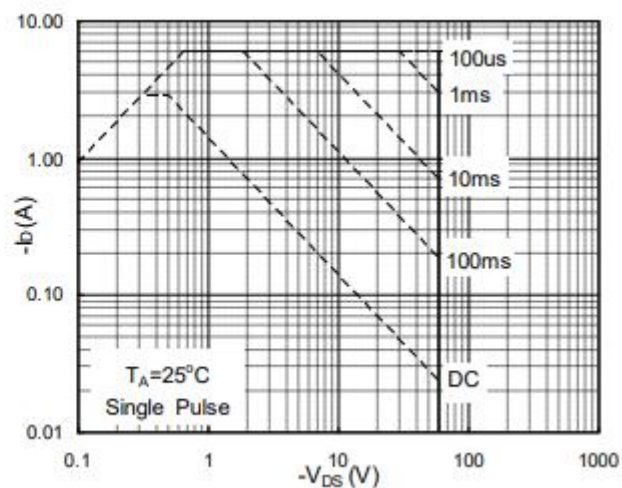


Fig.9 Normalized Maximum Transient Thermal Impedance

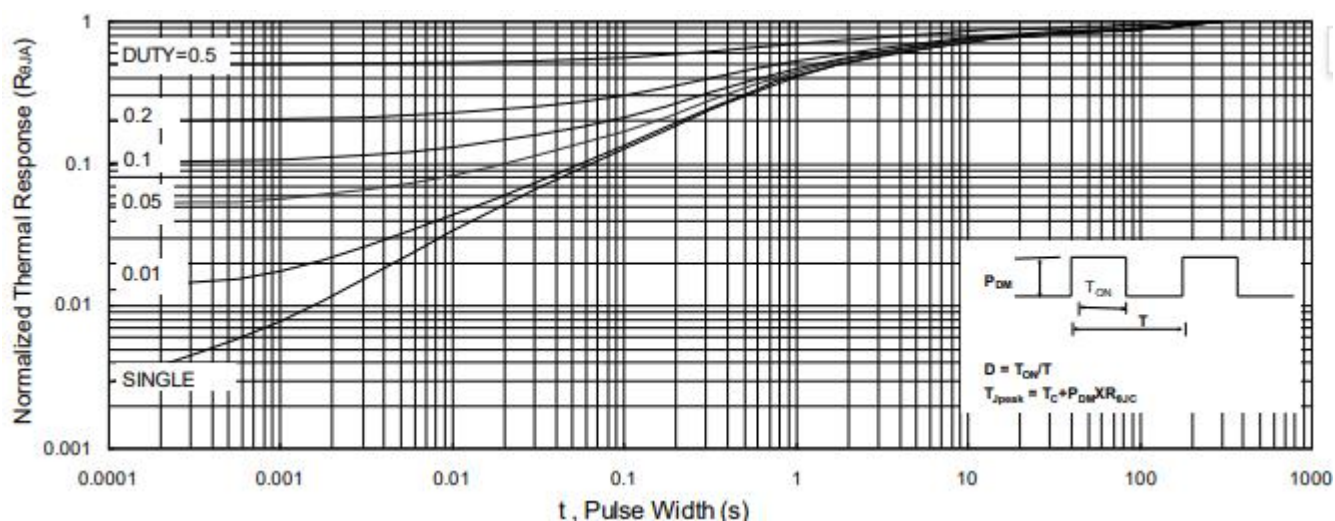


Fig.10 Switching Time Waveform

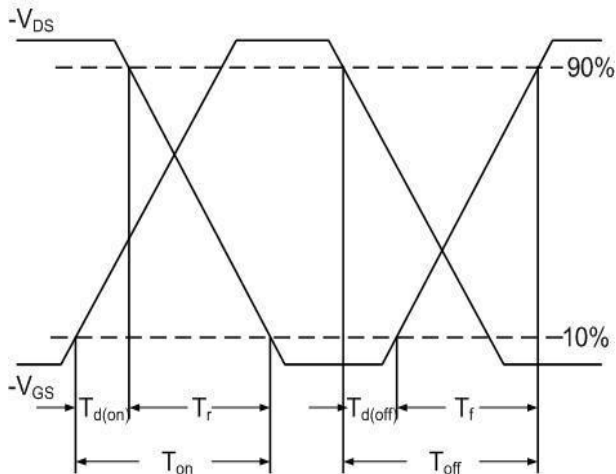
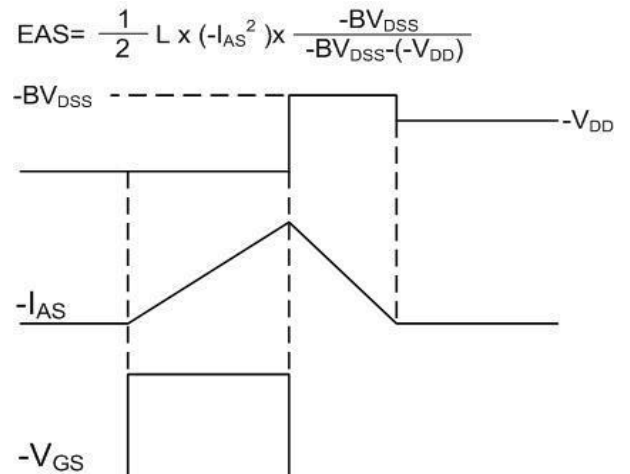
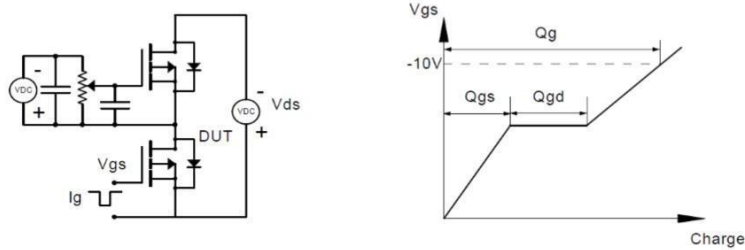


Fig.11 Unclamped Inductive Waveform

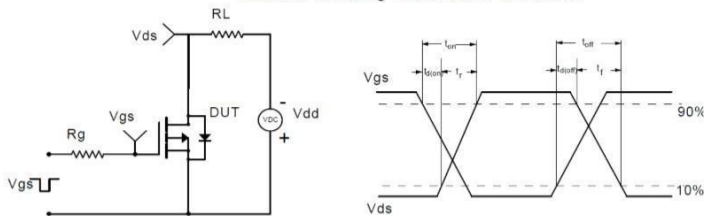


Test Circuit

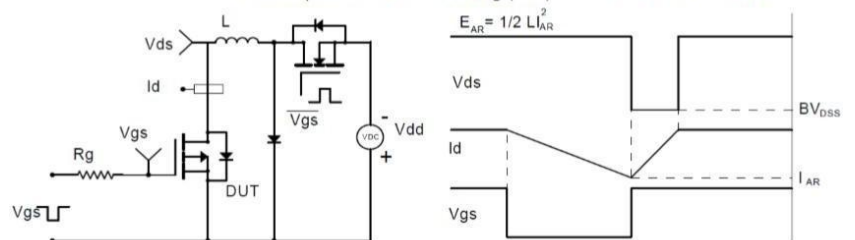
Gate Charge Test Circuit & Waveform



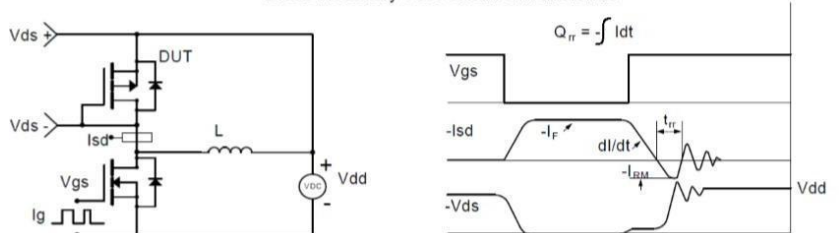
Resistive Switching Test Circuit & Waveforms



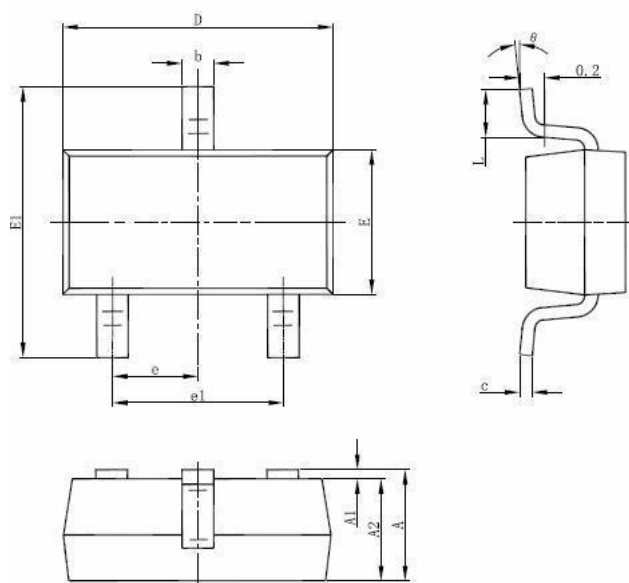
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



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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