ST47P06D

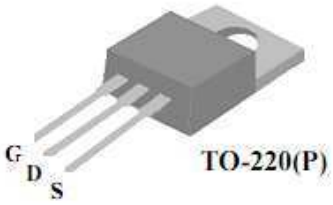
P Channel Enhancement Mode MOSFET

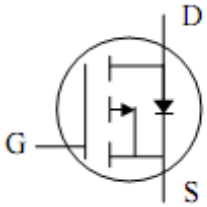
-47.0A

DESCRIPTION

ST47P06D is the P-Channel logic enhancement mode power field effect transistor which is produced using high cell density, DMOS trench technology.
This high density process is especially tailored to minimize on-state resistance.
These device is particularly suited for low voltage application, notebook computer power management and other battery circuits where high-side switching.

PIN CONFIGURATION





FEATURE

- -60V/-24A, $R_{DS(ON)}$ = 22mΩ (Typ.) @V_{GS} = -10V
- -60V/-10A, $R_{DS(ON)}$ = 30mΩ @V_{GS} = -4.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TO-220 package design

ABSOULTE MAXIMUM RATINGS (Ta = 25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		VDSS	-60	V
Gate-Source Voltage		VGSS	±20	V
Continuous Drain Current (TJ=150℃)	TA=25℃ TA=80℃	ID	-47.0 -33.0	A
Pulsed Drain Current		IDM	-180	A
Power Dissipation	TA=25℃	PD	160	W
Operation Junction Temperature		TJ	-55/150	℃
Storgae Temperature Range		TSTG	-55/150	℃
Thermal Resistance-Junction to Ambient		RθJA	62	℃/W

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ELECTRICAL CHARACTERISTICS (Ta = 25℃ Unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,ID=-250mA	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},ID=-250uA	-1.0		-3.0	V
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V,V_{GS}=0V			-1	uA
		V_{DS}=-48V,V_{GS}=0V T_J=125℃			-10	
Drain-source On-Resistance	$R_{DS(on)}$	V_{GS}=-10V,I_D=-24A V_{GS}=-4.5V,I_D=-10A		22 30	29 41	mΩ
Forward Transconductance	gfs	V_{DS}=-30V,I_D=-10A		21		S
Diode Forward Voltage	V_{SD}	I_S=-47A,V_{GS}=0V			-4.0	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=-48V R_G=25Ω I_D≡-47A		85	112	nC
Gate-Source Charge	Q_{gs}			1.6		
Gate-Drain Charge	Q_{gd}			4.3		
Input Capacitance	C_{iss}	V_{DS} =-25V V_{GS}=0V F=1.0MHz		2800	3600	pF
Output Capacitance	C_{oss}			1300	1700	
Reverse TransferCapacitance	C_{rss}			320	420	
Turn-On Time	$t_{d(on)}$	V_{DD}=-30V R_G= 25Ω I_D=-23.5A		52	110	nS
	tr			460	912	
Turn-Off Time	$t_{d(off)}$			100	210	
	tf			195	400	

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TYPICALCHARACTERICTICS

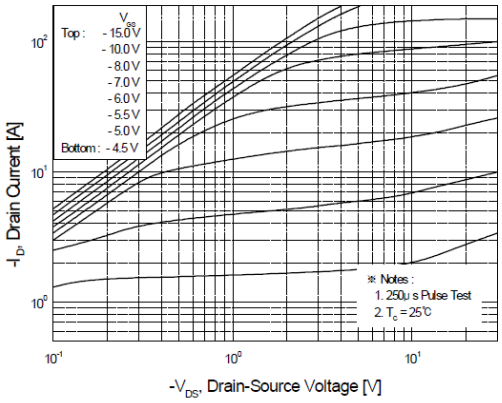

Figure 1. On-Region Characteristics

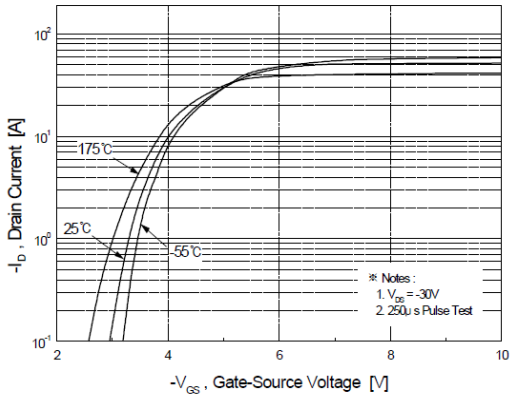

Figure 2. Transfer Characteristics

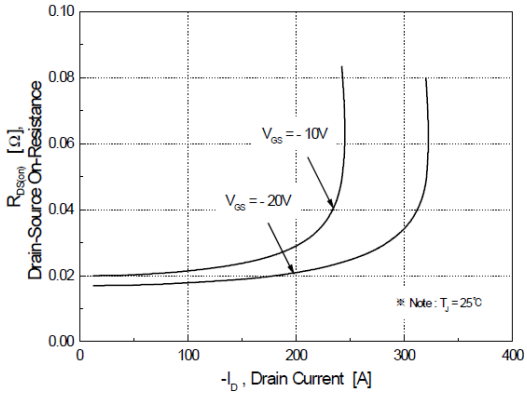

Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

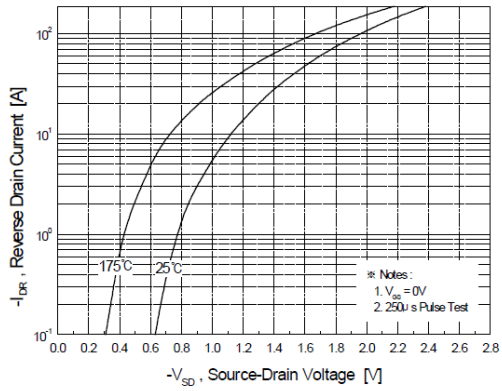

Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

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TYPICAL CHARACTERICTICS

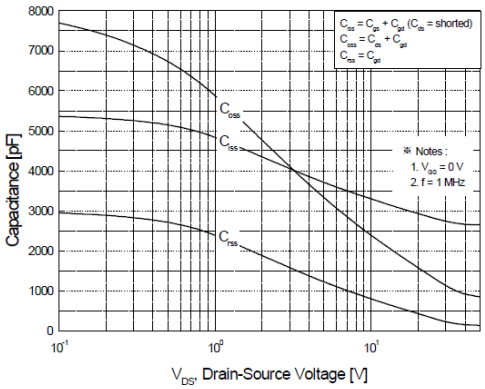

Figure 5. Capacitance Characteristics

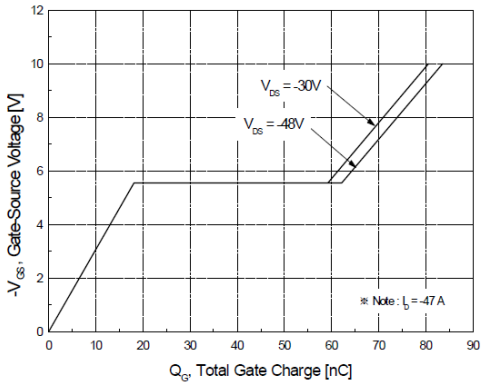

Figure 6. Gate Charge Characteristics

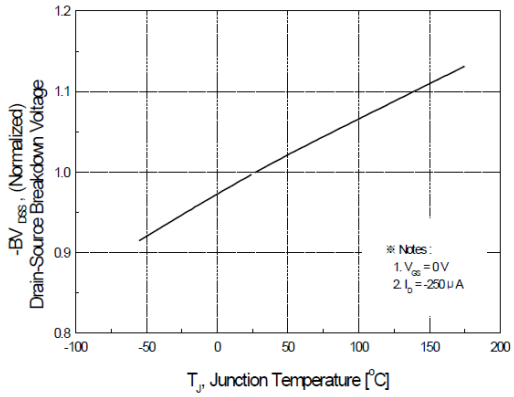

Figure 7. Breakdown Voltage Variation vs. Temperature

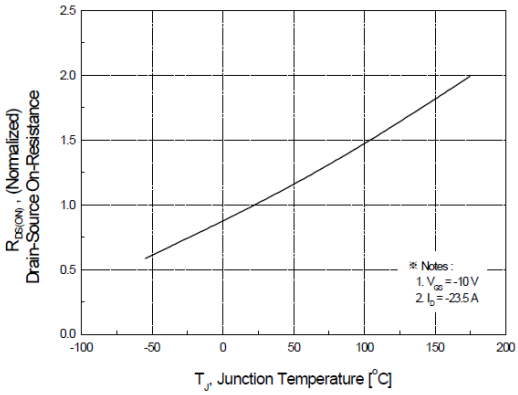

Figure 8. On-Resistance Variation vs. Temperature

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TYPICAL CHARACTERICTICS

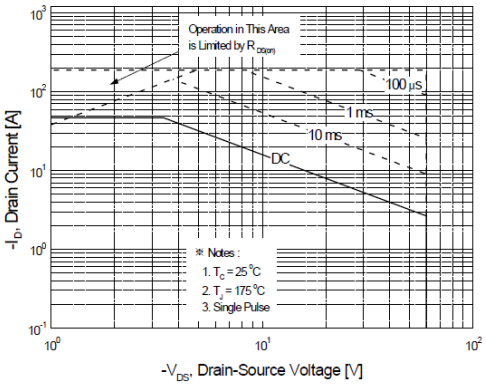

Figure 9. Maximum Safe Operating Area

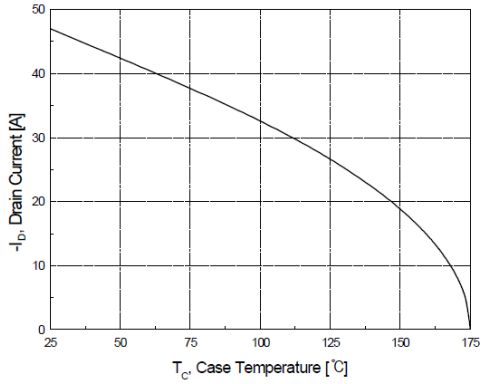

Figure 10. Maximum Drain Current vs. Case Temperature

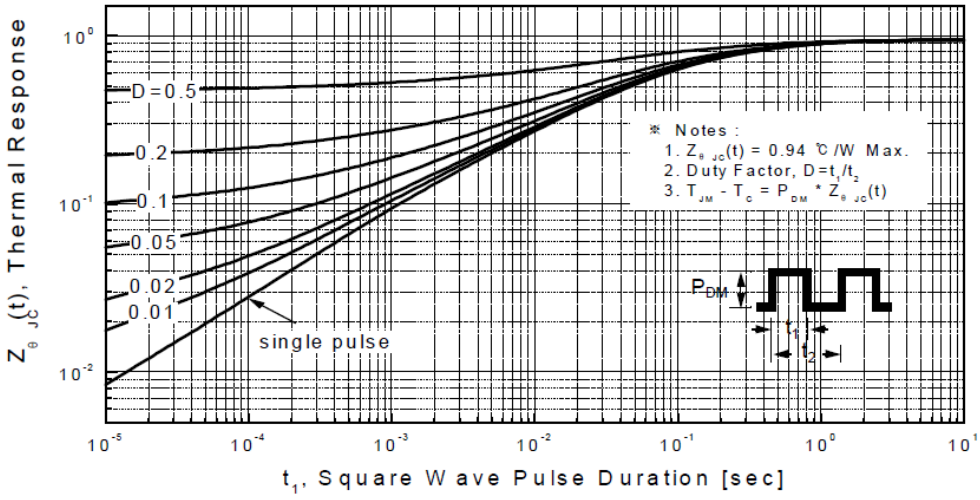

Figure 11. Transient Thermal Response Curve

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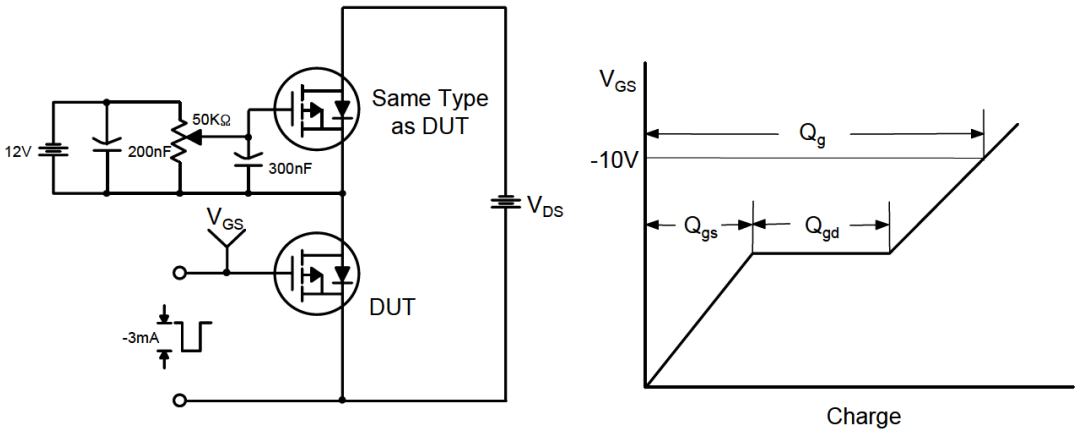
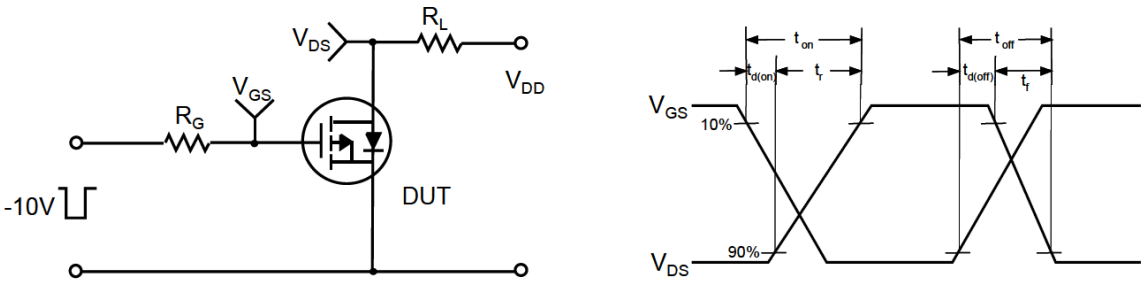
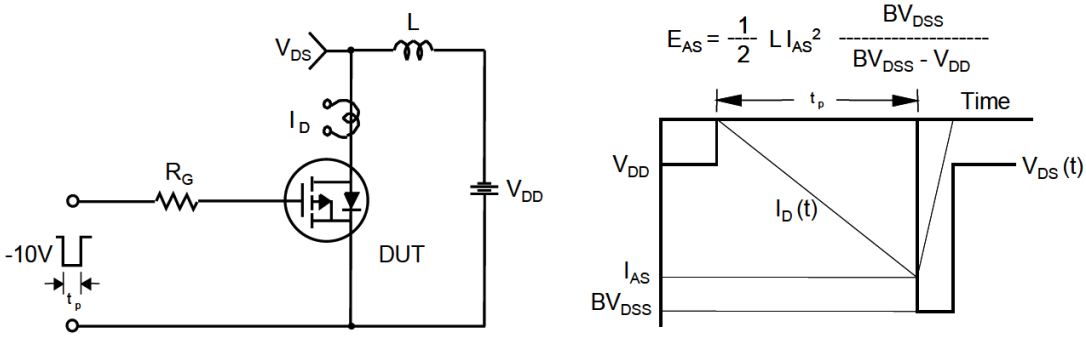
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



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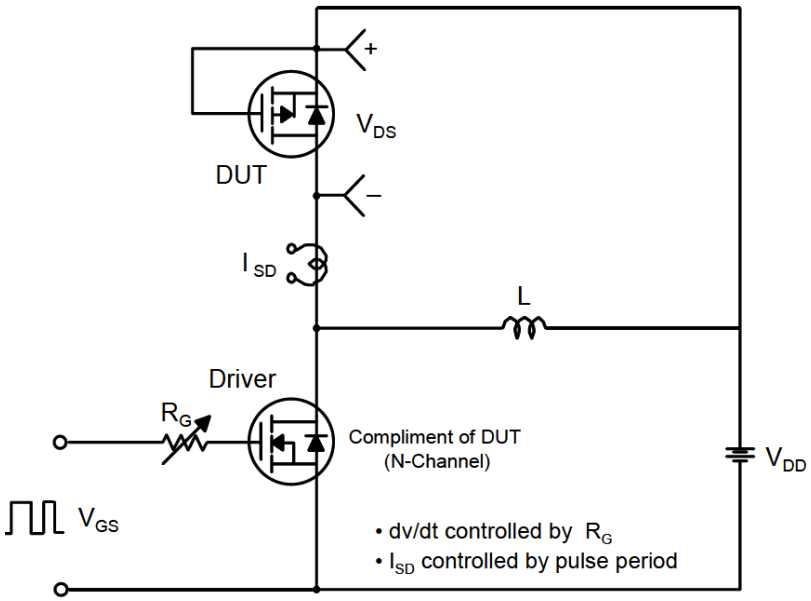
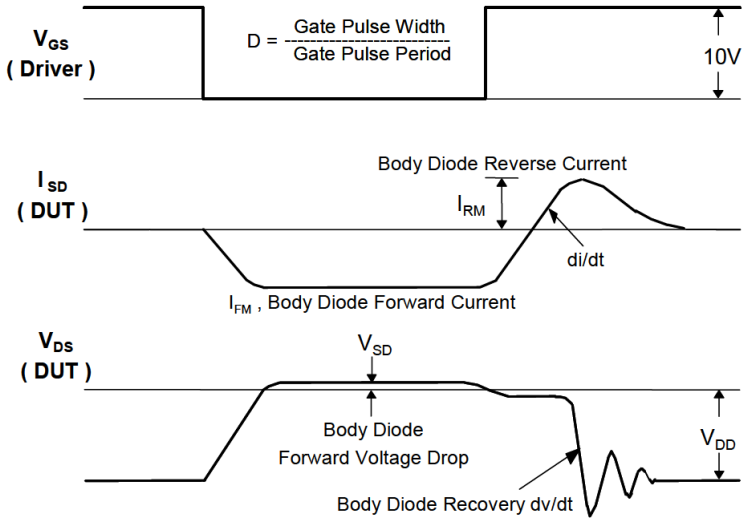
Peak Diode Recovery dv/dt Test Circuit & Waveforms





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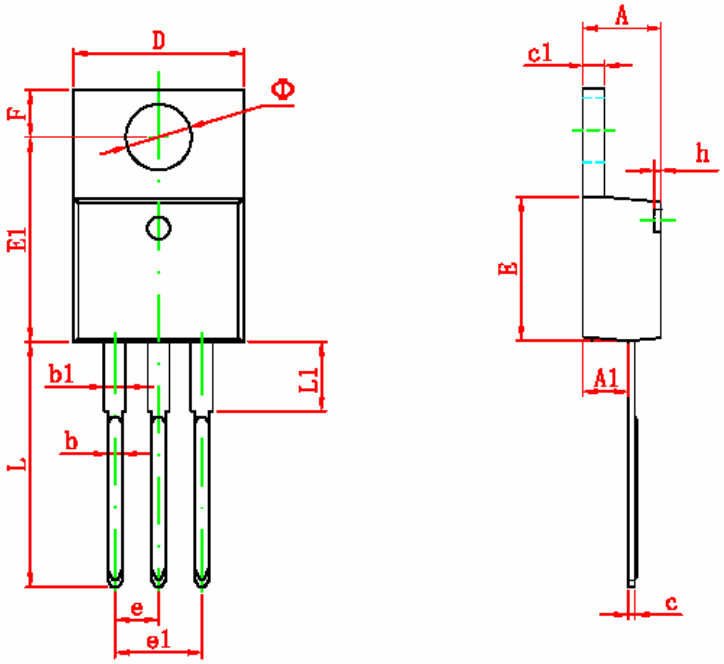
TO-220-3L PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
• •	3.735	3.935	0.147	0.155

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