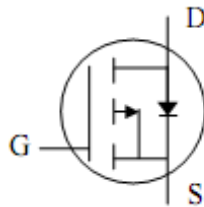
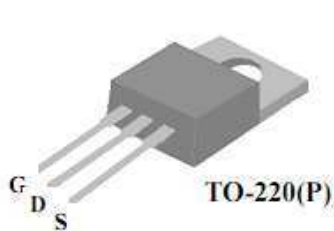


DESCRIPTION

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

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C Unless otherwise noted)

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



-47.0A

ELECTRICAL CHARACTERISTICS (Ta = 25°C Unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250mA$	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0		-3.0	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-60V, V_{GS}=0V$			-1	uA
		$V_{DS}=-48V, V_{GS}=0V$ $T_J=125^\circ C$			-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	g_{fs}	$V_{DS}=-30V, I_D=-10A$		21		S
Diode Forward Voltage	V_{SD}	$I_S=-47A, V_{GS}=0V$			-4.0	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-48V$ $R_G=25\Omega$ $I_D=-47A$		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 Transfer Capacitance	C_{rss}			320	420	
Turn-On Time	$t_{d(on)}$ t_r	$V_{DD}=-30V$ $R_G=25\Omega$ $I_D=-23.5A$		52	110	nS
				460	912	
Turn-Off Time	$t_{d(off)}$ t_f			100	210	
				195	400	

TYPICAL CHARACTERISTICS

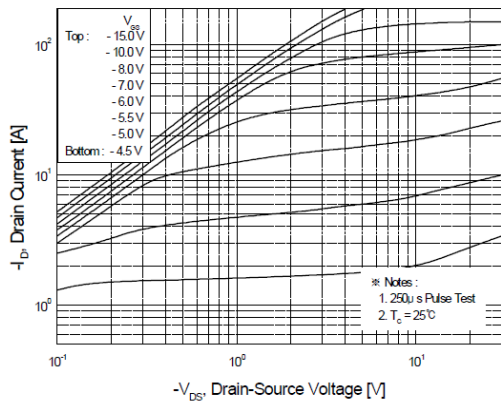


Figure 1. On-Region Characteristics

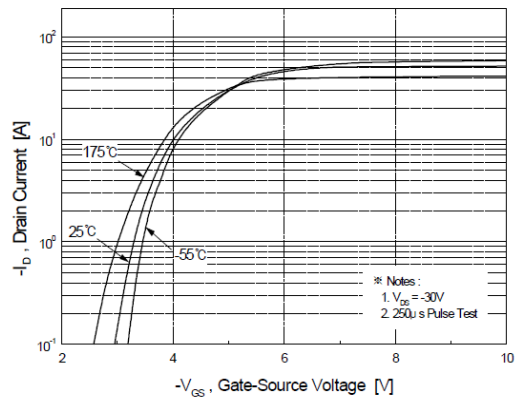


Figure 2. Transfer Characteristics

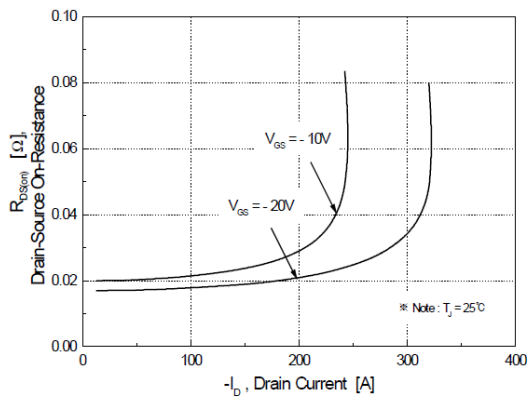


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

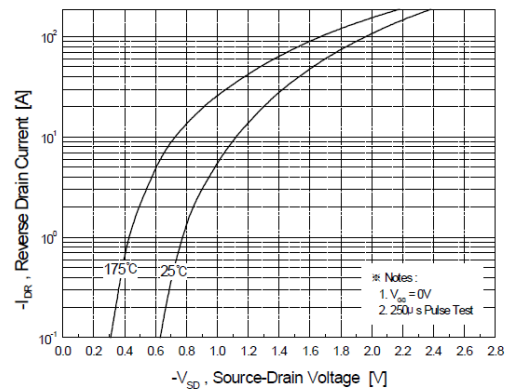


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

TYPICAL CHARACTERISTICS

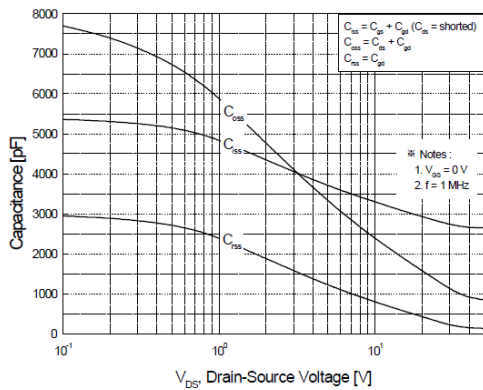


Figure 5. Capacitance Characteristics

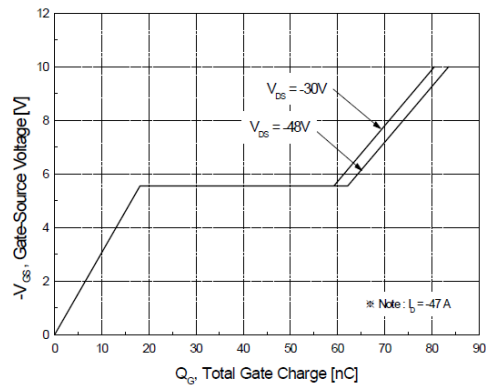


Figure 6. Gate Charge Characteristics

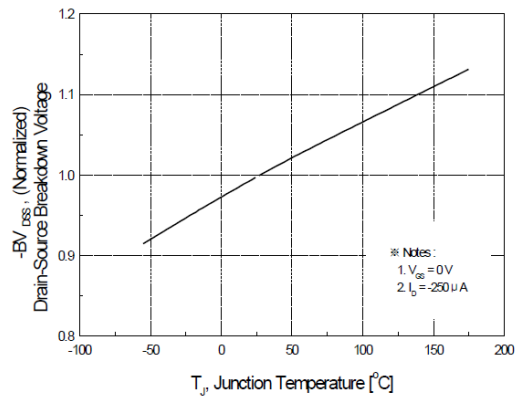


Figure 7. Breakdown Voltage Variation vs. Temperature

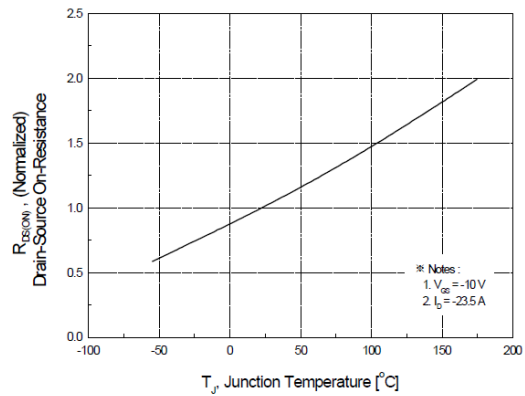


Figure 8. On-Resistance Variation vs. Temperature

TYPICAL CHARACTERISTICS

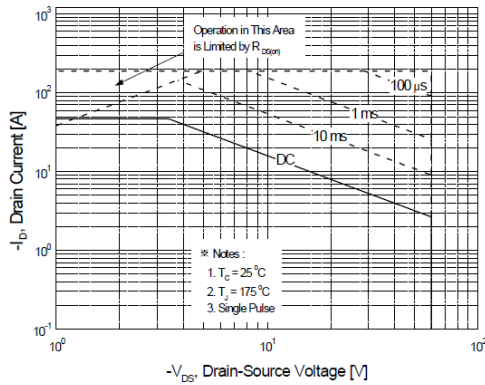


Figure 9. Maximum Safe Operating Area

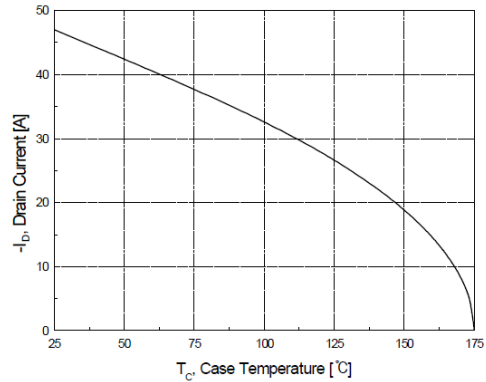


Figure 10. Maximum Drain Current vs. Case Temperature

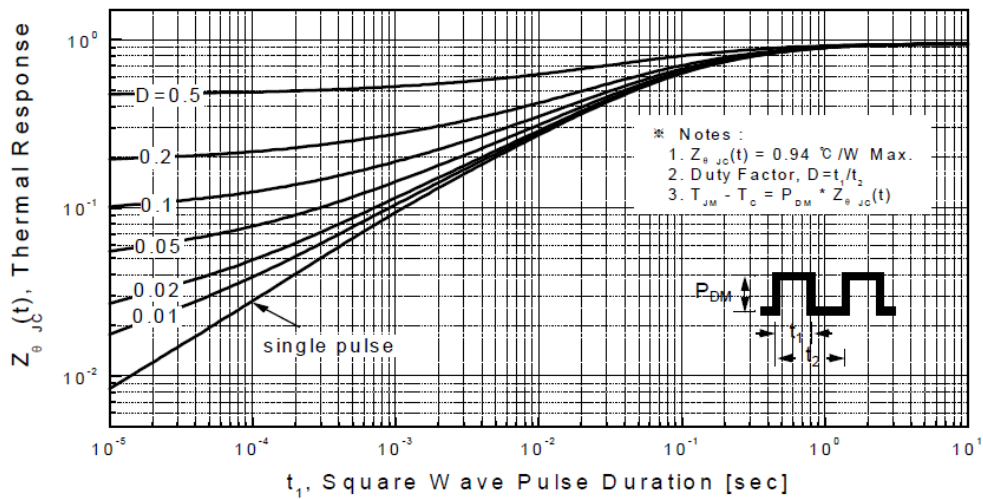
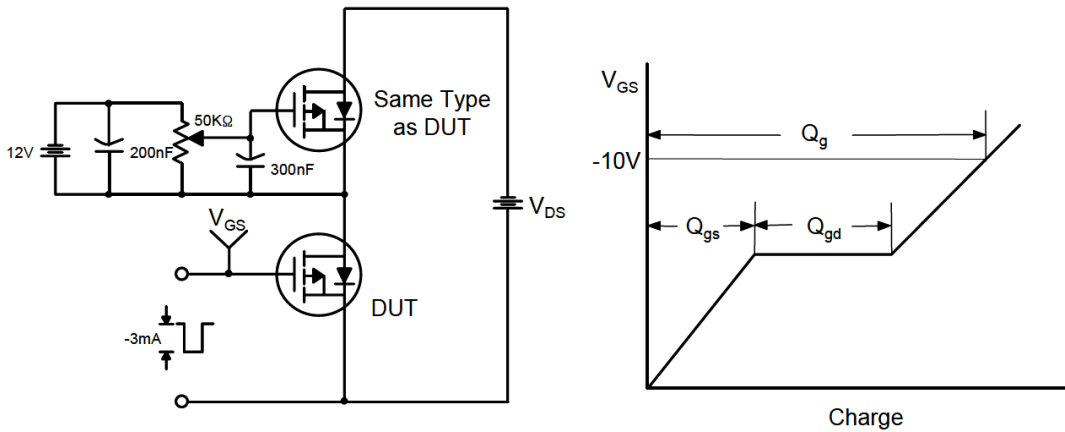
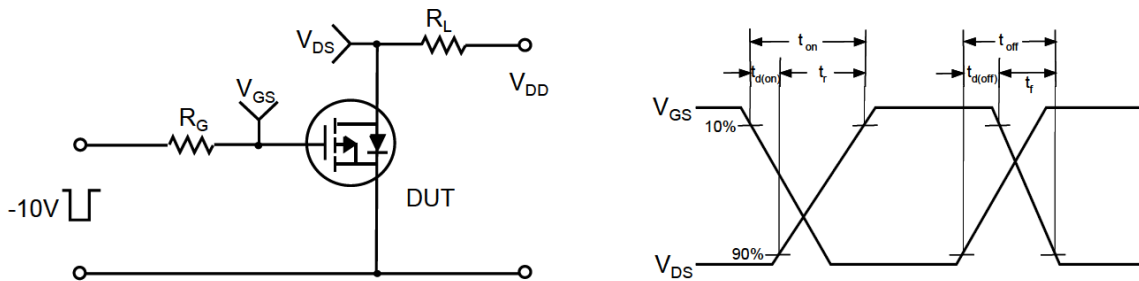


Figure 11. Transient Thermal Response Curve

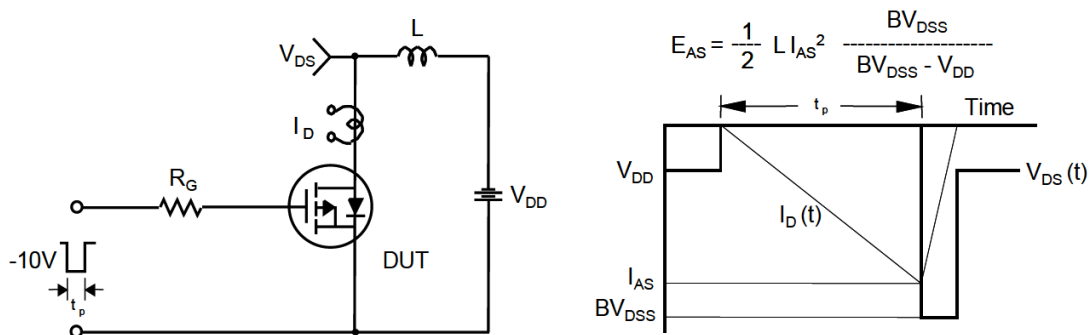
Gate Charge Test Circuit & Waveform

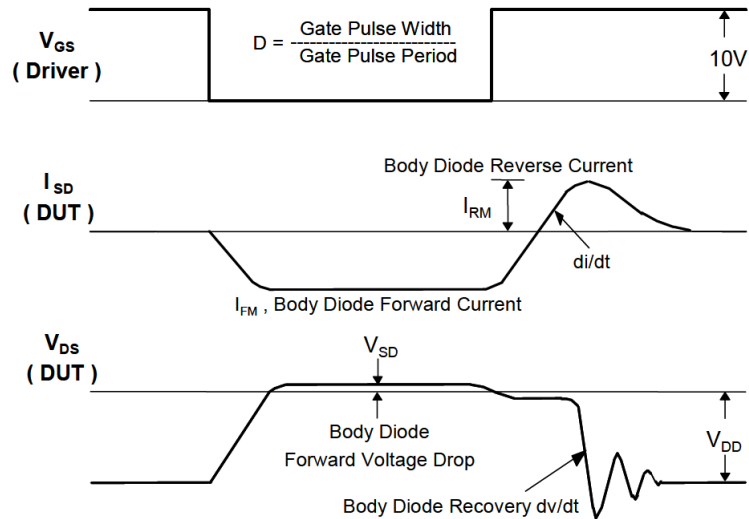
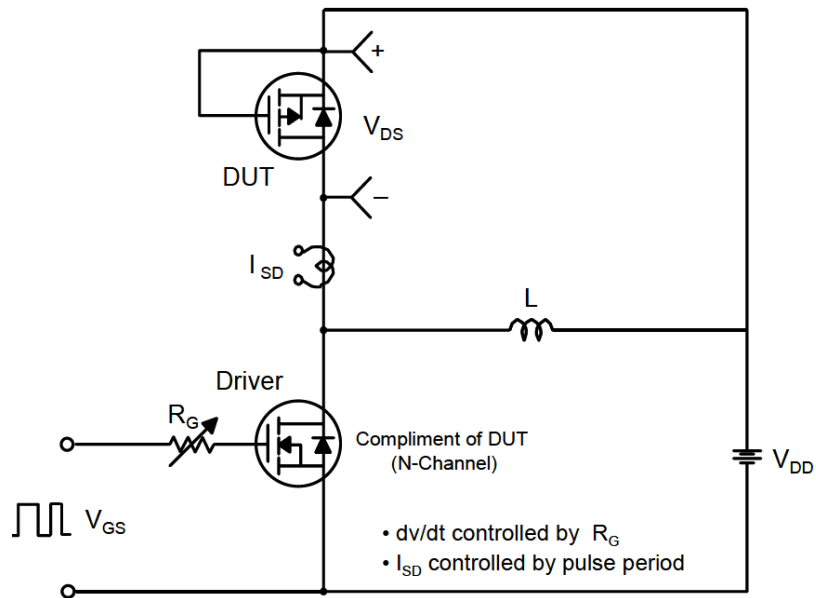


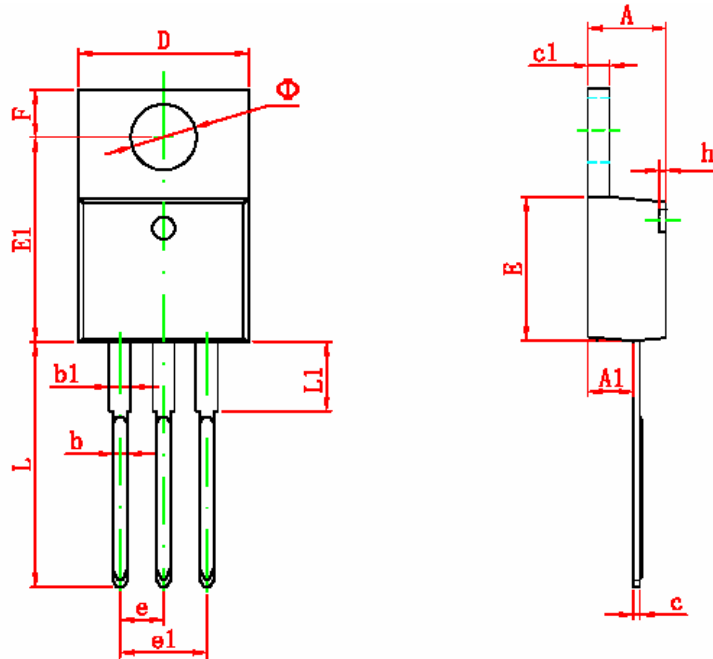
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms


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