

Industrial model	Popular name	Package identification	Packing method	Quantity per tube	Quantity per box	Quantity per carton
SPT18N50 SPF18N50	18N50 18N50	T: TO-220AB F: TO-220F	TUBE	50/tube	1Kpcs/box	5Kpcs

- APPLICATION
 - ELECTRONIC BALLAST
 - ELECTRONIC TRANSFORMER
 - SWITCH MODE POWER SUPPLY

$$I_D = 18A$$

$$BV_{DSS} = 500V$$

$$R_{DS(on)} = 0.25\Omega$$

- LOW ON-RESISTANCE
- FAST SWITCHING
- HIGH INPUT RESISTANCE
- RoHS COMPLIANT
- Package: TO-220AB & TO-220F

SPF/T18N50 Series Pin Assignment

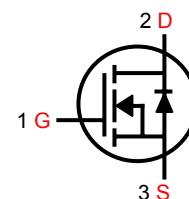


3-Lead Plastic TO-220AB
Package Code: T
Pin 1: Gate
Pin 2 & Tab: Drain
Pin 3: Source



3-Lead Plastic TO-220F
Package Code: F
Pin 1: Gate
Pin 2: Drain
Pin 3: Source

Series Symbol:



ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage		V_{DSS}	500	V
Gate to Source Voltage		V_{GSS}	± 30	V
Drain Current	Continuous	I_D	18	A
	Pulsed (Note 2)	I_{DM}	72 (Note 5)	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	945	mJ
	Repetitive (Note 2)	E_{AR}	23.5	mJ
Avalanche Current (Note 2)		I_{AR}	18	A
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.5	V/ns
Power Dissipation	TO-220F	P_D	38.5	W
	TO-220AB		40.5	
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Note: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating: Pulse width limited by maximum junction temperature

3. $L=5.2mH$, $I_{AS}=18A$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$

4. $I_{SD} \leq 18A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ C$

5. Drain current limited by maximum junction temperature

■ THERMAL DATA

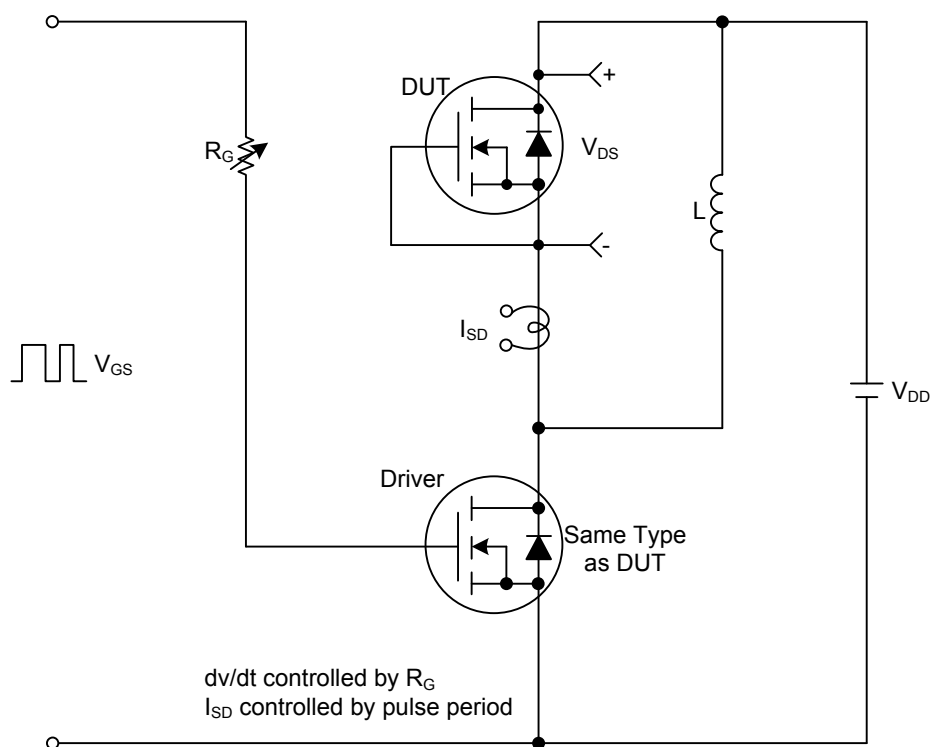
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	°C/W
Junction to Case	TO-220F	θ_{JC}	3.3	°C/W
	TO-220AB		3.0	

■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

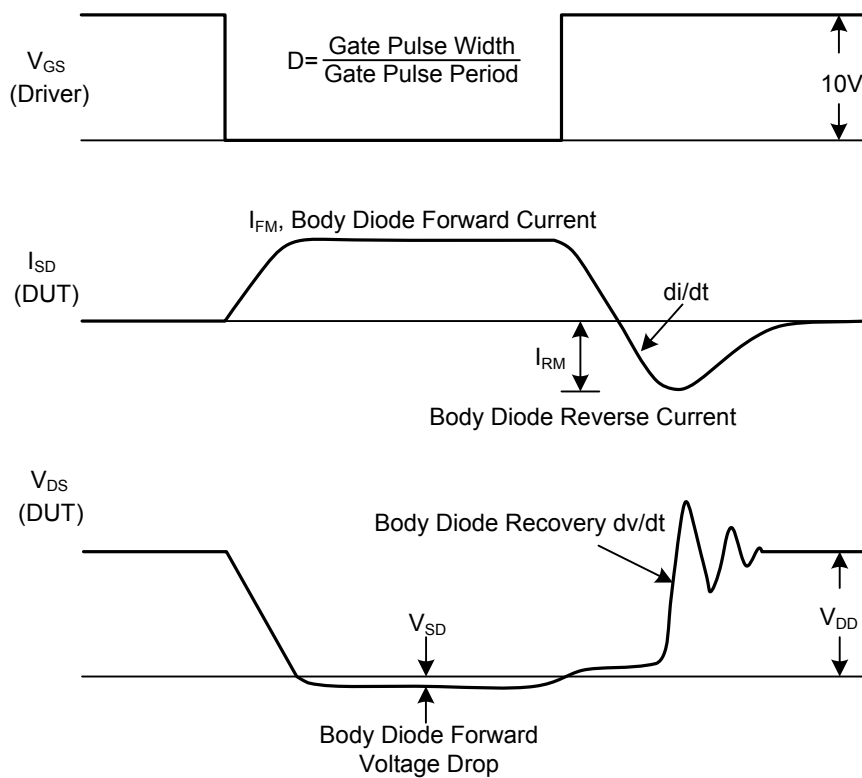
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	500			V
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25°C		0.5		V/°C
Drain-Source Leakage Current		I _{DSS}	V _{DS} =500V, V _{GS} =0V			1	μA
			V _{DS} =400V, T _C =125°C			10	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} = 30 V, V _{DS} = 0 V			100	nA
	Reverse		V _{GS} = -30 V, V _{DS} = 0 V			-100	
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250uA	2		4.5	V
Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =9A		0.21	0.25	Ω
Forward Transconductance		g _{FS}	V _{DS} =40V, I _D =9A (Note 1)		25		S
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		2200	2860	pF
Output Capacitance		C _{OSS}			330	430	pF
Reverse Transfer Capacitance		C _{RSS}			25	40	pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =400V, V _{GS} =10V, I _D =18A (Note 1,2)		45	60	nC
Gate-Source Charge		Q _{GS}			12.5		nC
Gate-Drain Charge		Q _{GD}			19		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =250V, I _D =18A, R _G =25Ω (Note 1,2)		55	120	ns
Turn-ON Rise Time		t _R			165	340	ns
Turn-OFF Delay Time		t _{D(OFF)}			95	200	ns
Turn-OFF Fall Time		t _F			90	190	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				18	A
Maximum Body-Diode Pulsed Current		I _{SM}				72	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =18A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time		t _{rr}	V _{GS} =0V, I _S =18A,		500		ns
Body Diode Reverse Recovery Charge		Q _{RR}	dl _F /dt=100A/μs (Note 1)		5.4		μC

Note: 1. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
2. Essentially independent of operating temperature

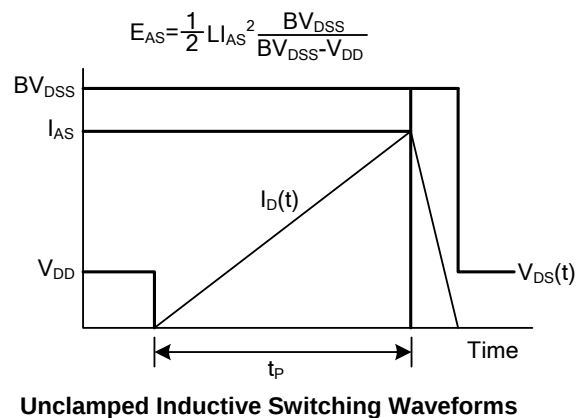
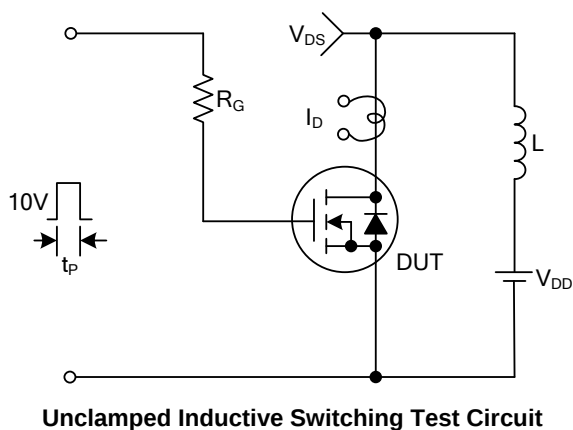
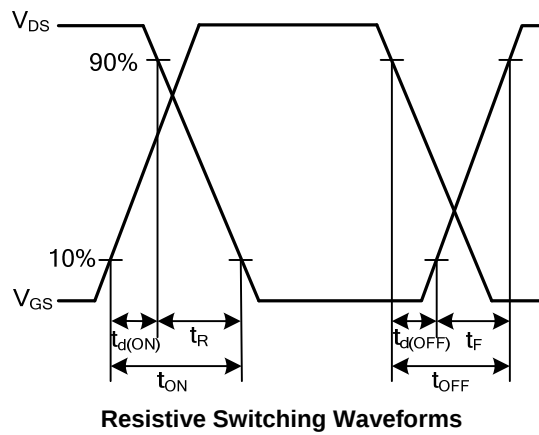
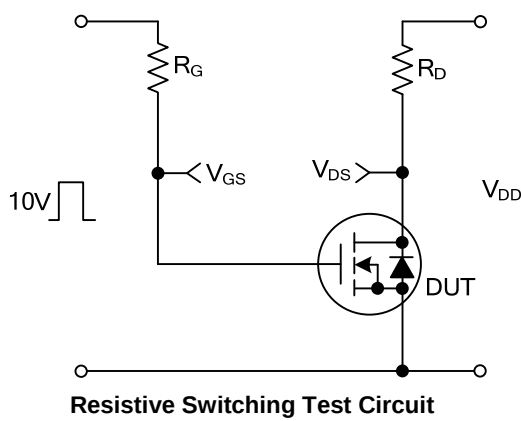
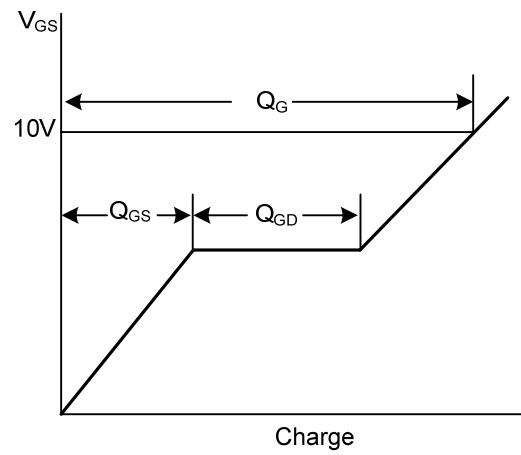
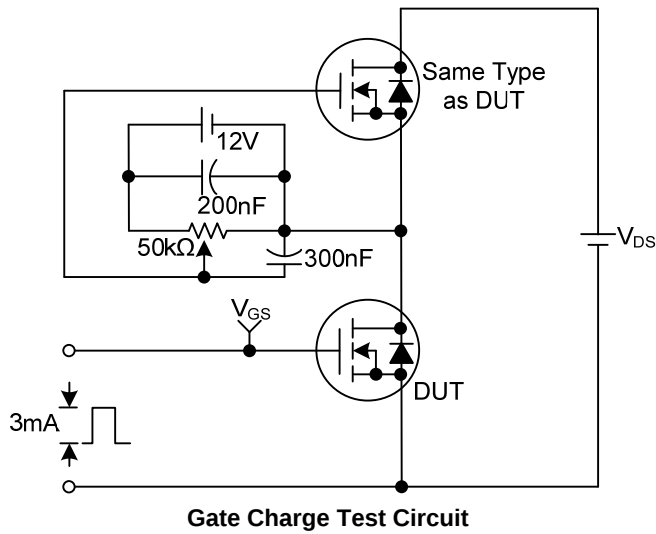
■ TEST CIRCUITS AND WAVEFORMS



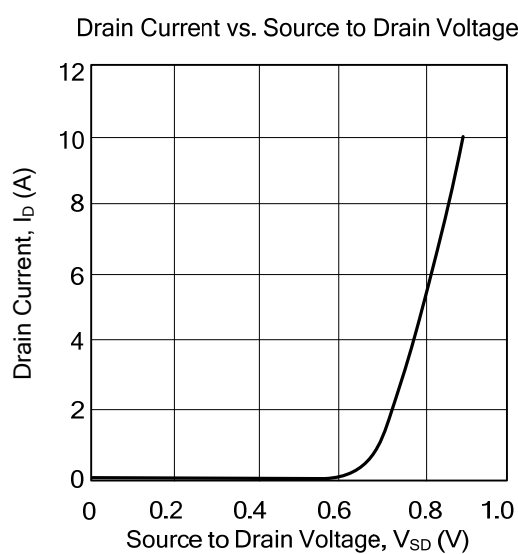
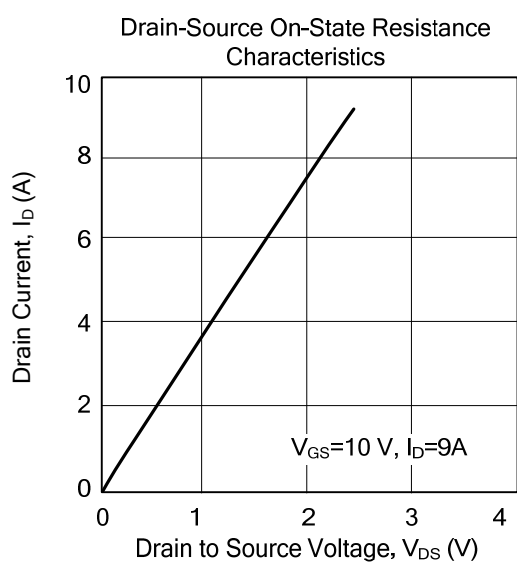
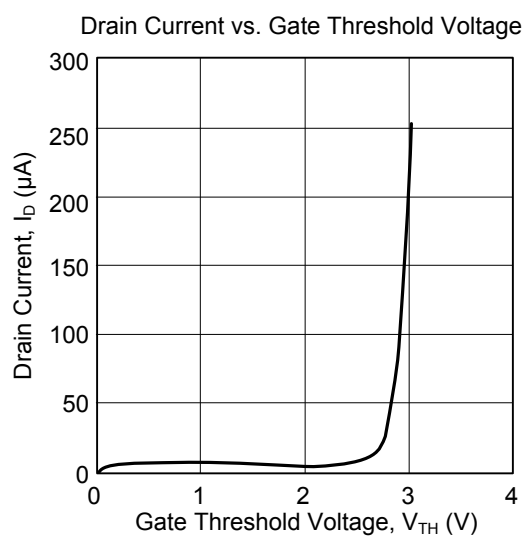
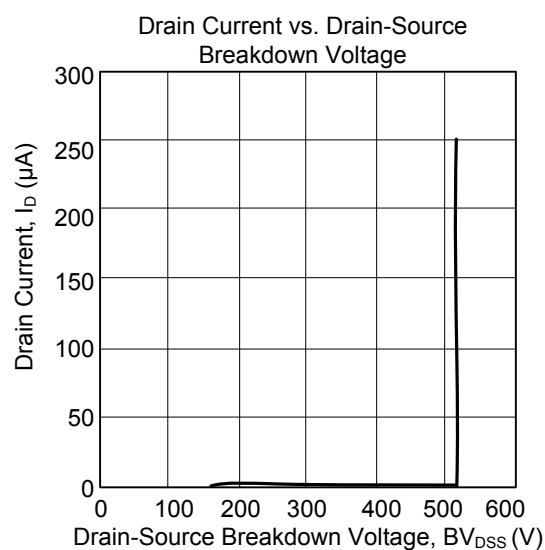
Peak Diode Recovery dv/dt Test Circuit & Waveforms



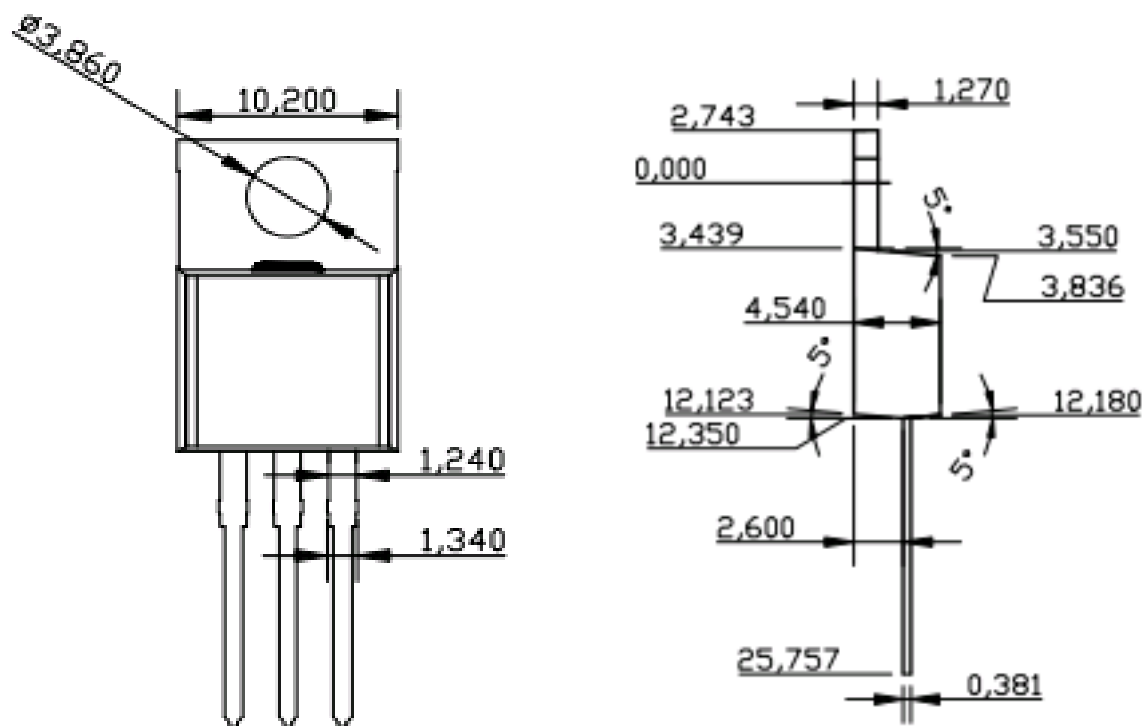
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



■ TYPICAL CHARACTERISTICS



TO-220-3L PACKAGE OUTLINE DIMENSIONS



TO-220F- 3L PACKAGE OUTLINE DIMENSIONS

