

5.0 Amps, 800 Volts N-Channel MOS-FET

DESCRIPTION

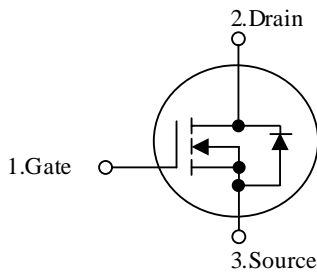
These N-Channel enhancement mode power field effect Transistors are produced using planar stripe, DMOS technology.

This advanced technology has been especially tailored to minimize on - state resistance , provide superior switching performance, and Withstand high energy pulse in the avalanche and commutation mode .These devices are well suited for high efficiency switch mode power supply, electronic lamp ballasts based on half bridge topology.

FEATURES

- * $R_{DS(ON)} = 2.7\Omega @ V_{GS} = 10V$
- * Fast switching capability
- * Avalanche energy tested
- * Improved dv/dt capability, high ruggedness

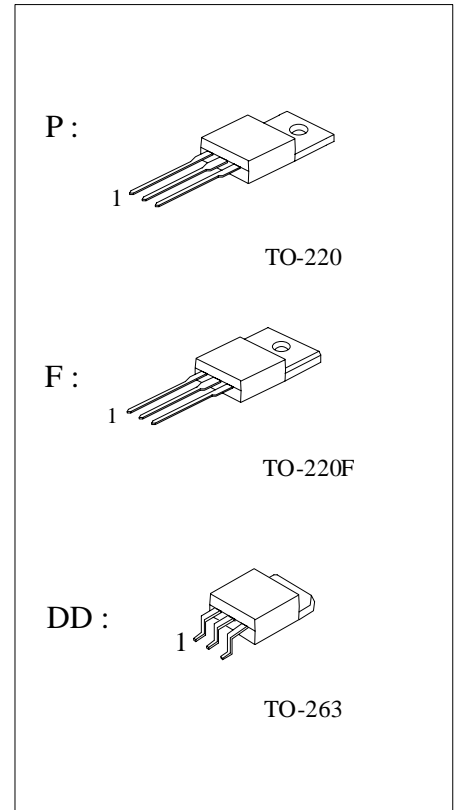
SYMBOL



ORDERING INFORMATION

Order Number	Package	Pin Assignment			Packing
		1	2	3	
FTK5N80P	TO-220	G	D	S	Tube
FTK5N80F	TO-220F	G	D	S	Tube
FTK5N80DD	TO-263	G	D	S	Reel & Taping

Note: Pin Assignment: G: Gate D: Drain S: Source





FTK5N80P/F/DD

■ ABSOLUTE MAXIMUM RATINGS (T_c=25°C, unless otherwise specified)

PARAMET		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	800	V
Gate-Source Voltage		V _{GSS}	±30	V
Avalanche Current (Note 1)		I _{AR}	5.0	A
Continuous Drain Current	T _C = 25°C	I _D	5.0	A
	T _C = 100°C		3.0	
Pulsed Drain Current (Note 1)		I _{DM}	20	A
Avalanche Energy Single Pulse(Note 2)		E _{AS}	320	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Power Dissipation (TO-220,TO-263/ TO-220F)	T _C = 25°C	P _D	142 / 48	W
	Derate above 25°C		1.14 / 0.38	W / °C
Junction Temperature		T _J	+150	°C
Operating and Storage Temperature		T _{STG}	-55 ~ +150	°C

Note: 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.

■ THERMAL DATA

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Junction-to-Ambient		θ _{JA}			62.5	°C / W
Junction-to-Case	TO-220, TO-263	θ _{Jc}			1.0	
	TO-220F	θ _{Jc}			3.12	

■ ELECTRICAL CHARACTERISTICS (T_c=25°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	800			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} = 800V, V _{GS} = 0V			10	μA
Gate-Body Leakage Current	Forward	I _{GSSF}	V _{GS} = 30V, V _{DS} = 0V			100	nA
	Reverse	I _{GSSR}	V _{GS} = -30V, V _{DS} = 0V			-100	nA
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} / ΔT _J	I _D = 250μA, Referenced to 25°C		0.93		V / °C
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250μA	2.0		4.0	V
Static Drain-Source On-Resistance		R _{DS(ON)}	V _{GS} = 10V, I _D = 2.50A			2.7	Ω
Forward Transconductance		g _{FS}	V _{DS} = 40V, I _D = 2.5A (Note 4)		5.5		S
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz		1020		pF
Output Capacitance		C _{OSS}			77		pF
Reverse Transfer Capacitance		C _{RSS}			10.3		pF
SWITCHING CHARACTERISTICS							
Turn-On Delay Time		t _{D(ON)}	V _{DD} =400V, I _D =2.5A, R _G = 25Ω (Note 4,5)		50		ns
Turn-On Rise Time		t _r			85		ns
Turn-Off Delay Time		t _{D(OFF)}			120		ns
Turn-Off Fall Time		t _f			30		ns
Total Gate Charge		Q _G			21		nC
Gate-Source Charge		Q _{GS}	V _{DS} = 640V, I _D = 4A, V _{GS} = 10V (Note 4,5)		3.2		nC
Gate-Drain Charge		Q _{GD}			78		nC



■ ELECTRICAL CHARACTERISTICS (T_C = 25°C , unless Otherwise specified.)

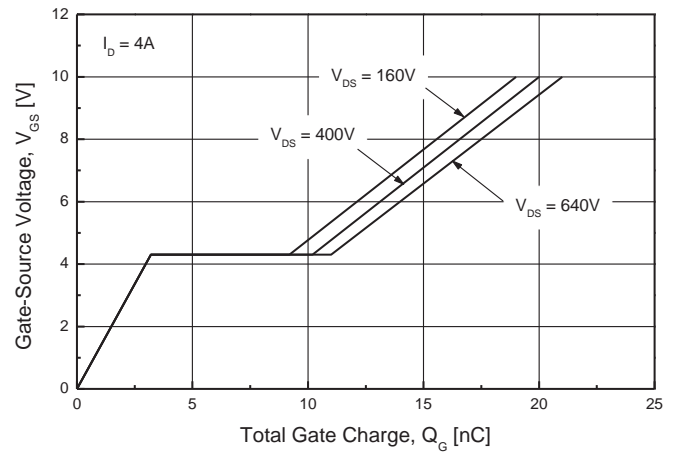
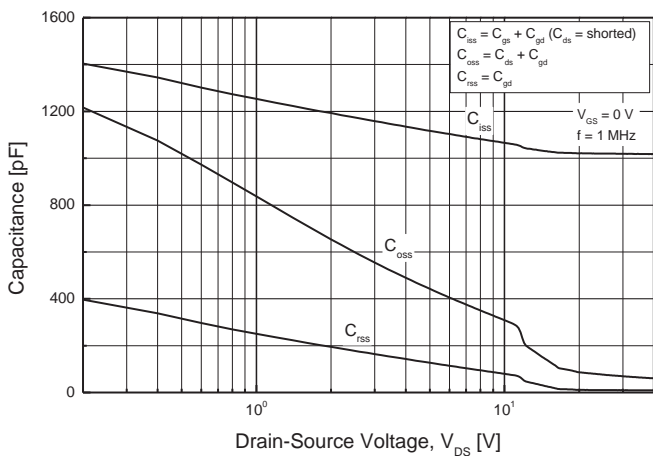
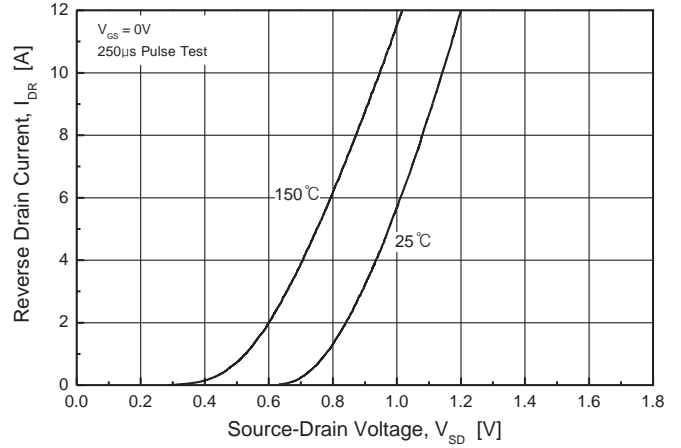
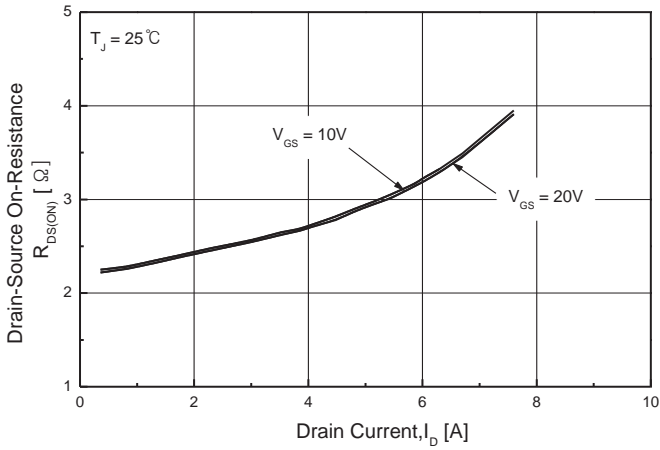
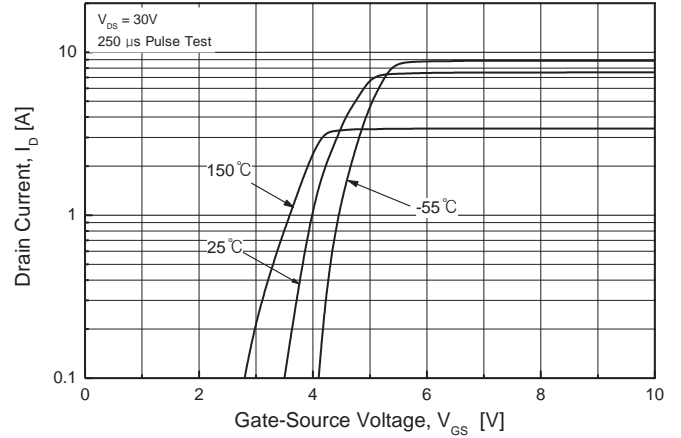
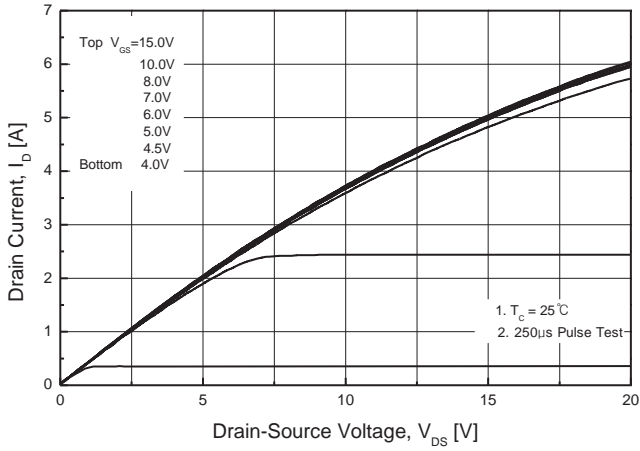
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 5.0A			1.4	V
Maximum Continuous Drain-Source Diode Forward Current	I _S				5.5	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				20	A
Reverse Recovery Time	t _{RR}	V _{GS} = 0 V, I _S = 5.0A,		700		ns
Reverse Recovery Charge	Q _{RR}	dI _F /dt = 100 A/μs (Note 4)		7.7		μC

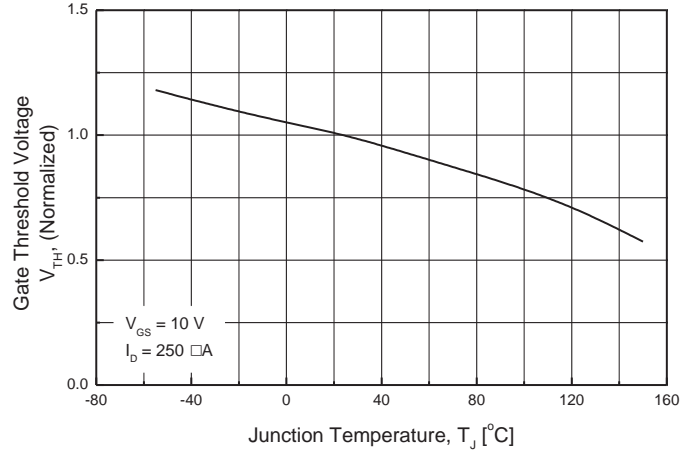
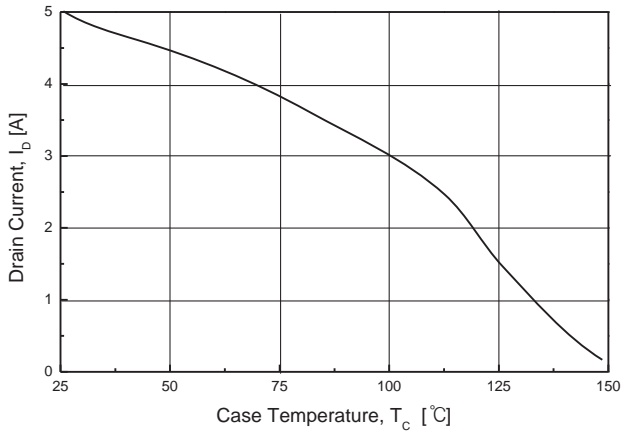
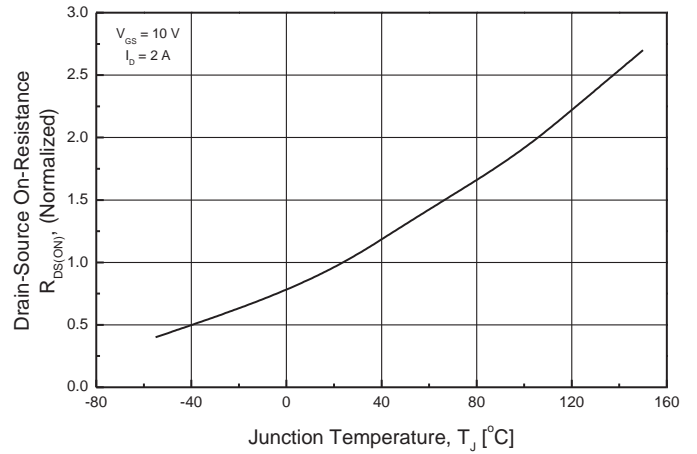
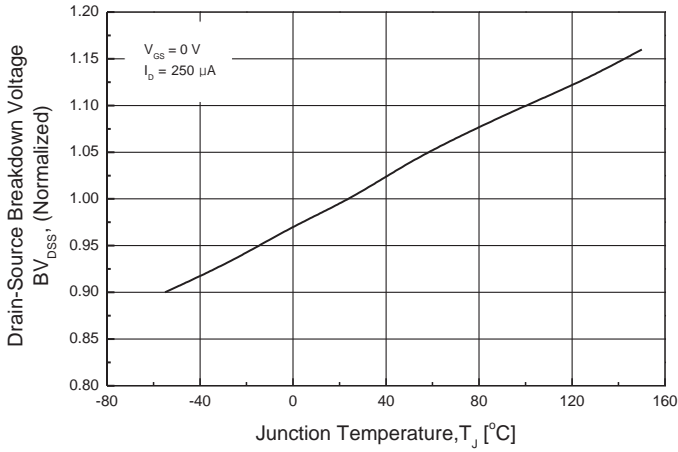
Notes:

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. Pulse width limited by safe operating area.
3. Starting T_J=25°C, I_D=I_{AR}, V_{DD}=50V
4. Pulsed: Pulse duration=300μs, duty cycle 1.5%.
5. Essentially independent of operating temperature

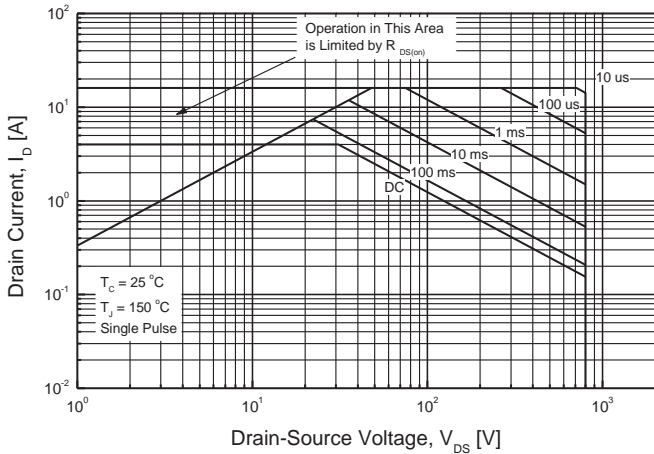


FTK5N80P/F/DD





FTK5N80P



FTK5N80F

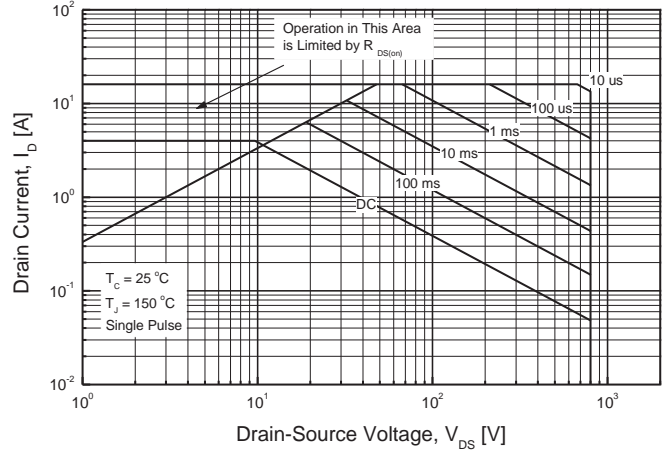


Fig11. Transient Thermal Response Curve

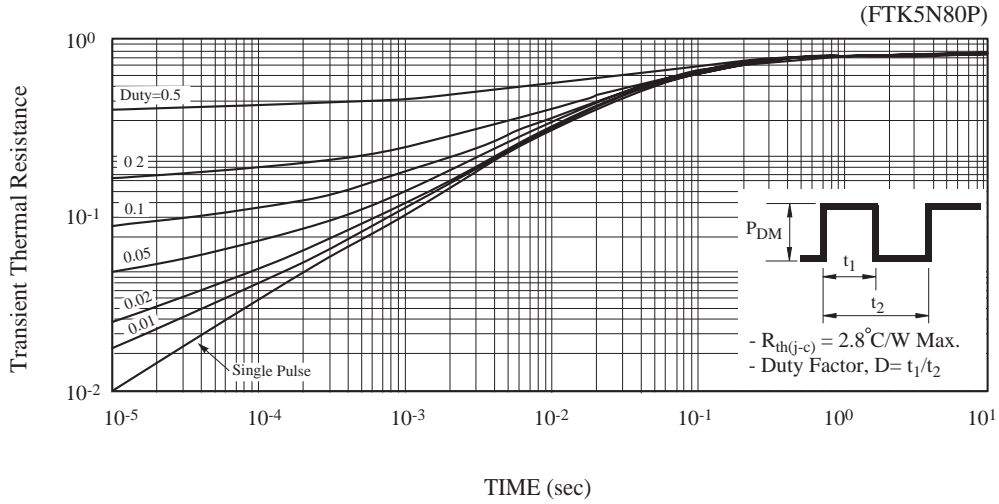
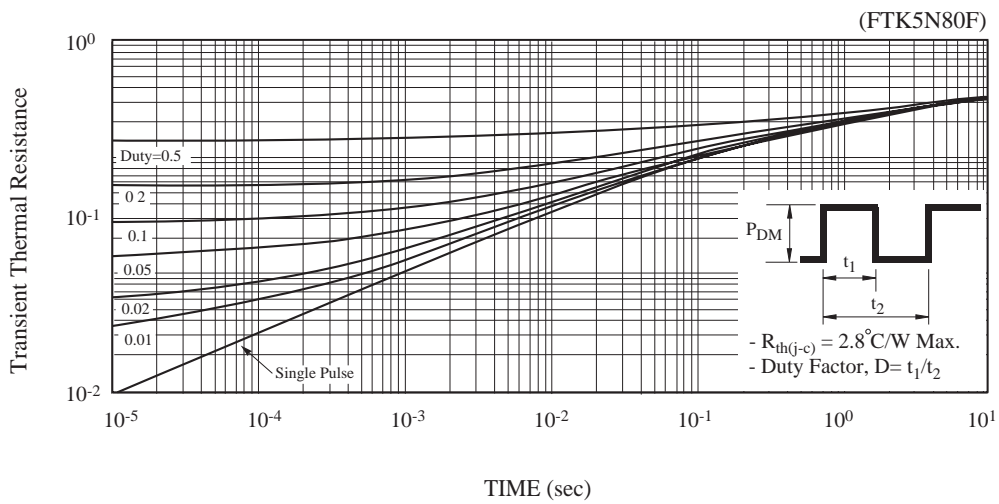


Fig12. Transient Thermal Response Curve



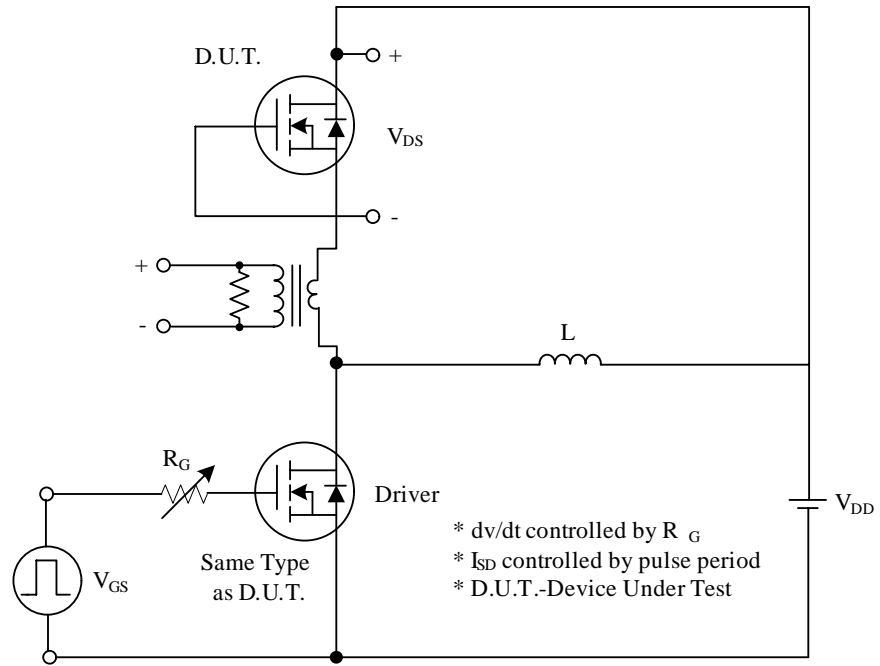


Fig. 1A Peak Diode Recovery dv/dt Test Circuit

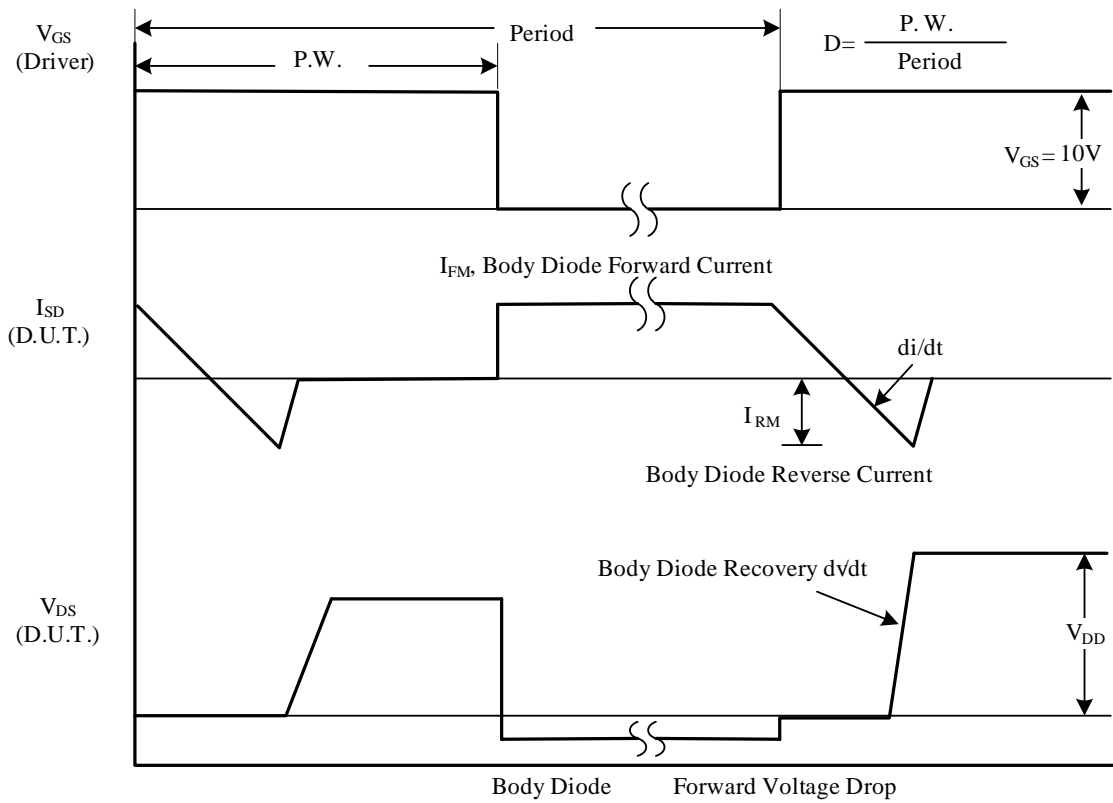


Fig. 1B Peak Diode Recovery dv/dt Waveforms

■ TEST CIRCUITS AND WAVEFORMS (Cont.)

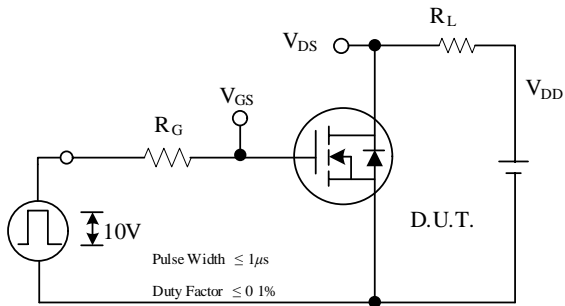


Fig. 2A Switching Test Circuit

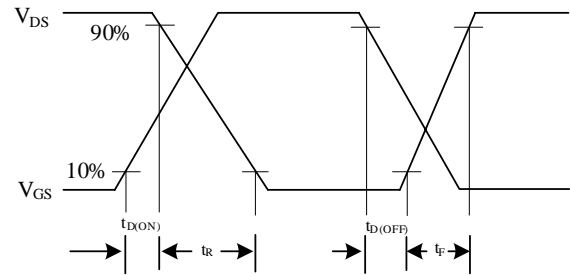


Fig. 2B Switching Waveforms

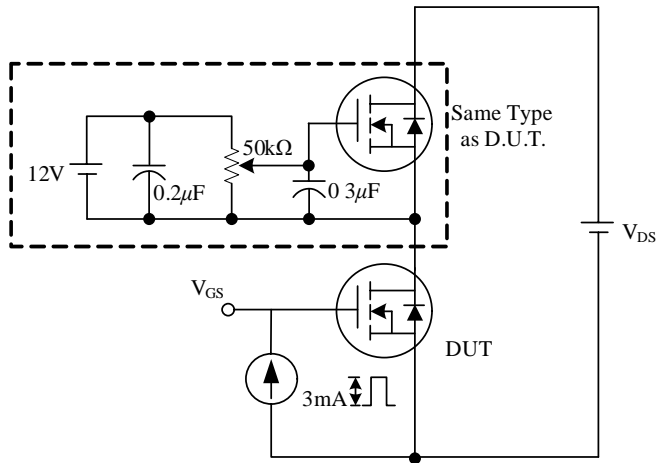


Fig. 3A Gate Charge Test Circuit

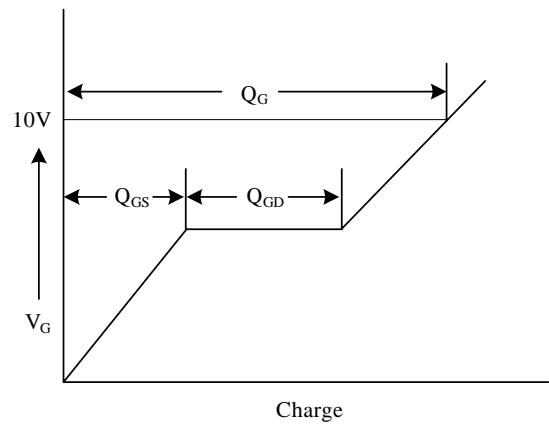


Fig. 3B Gate Charge Waveform

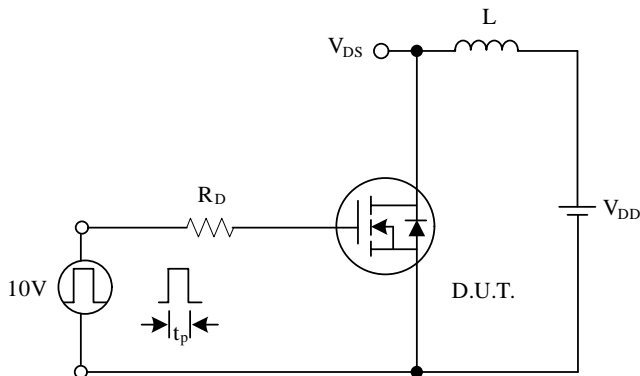


Fig. 4A Unclamped Inductive Switching Test Circuit

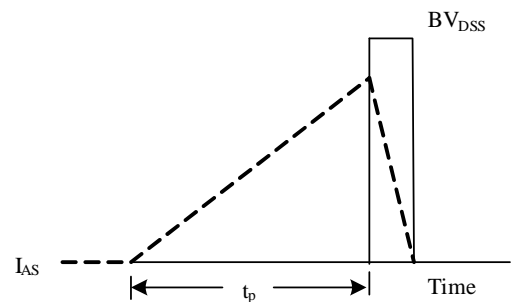


Fig. 4B Unclamped Inductive Switching Waveforms