ATM7N65TF

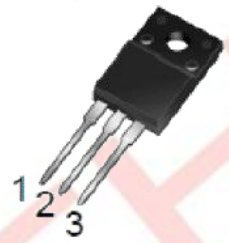
N-Channel Enhancement Mode Field Effect Transistor

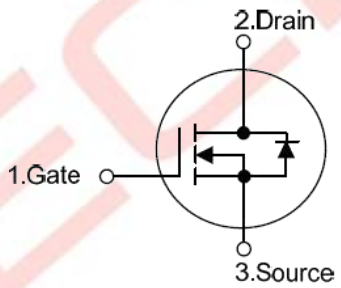
Drain-Source Voltage: 650V ***Drain Current: 7A***

DESCRIPTION

The ATM7N65TF is a high voltage N-Channel enhancement mode power field effect transistors designed to have minimize on-state resistance, superior switching performance and withstand high energy pulse in the avalanche and commutation mode. This power MOSFET is well suited for high efficiency switch mode power supply.

TO-220F





FEATURES

- $R_{DS(ON)}$ = 1.4Ω @V_{GS} = 10 V
- Ultra low gate charge (typical 28 nC)
- Low reverse transfer Capacitance (C_{RSS}= typical 12 pF)
- Fast switching capability
- Avalanche energy tested
- Improved dv/dt capability, high ruggedness

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	650	V
Gate-Source Voltage		V_{GSS}	±30	V
Avalanche Current (Note 2)		I_{AR}	7	A
Continuous Drain Current		I_D	7	A
Pulsed Drain Current (Note 2)		I_{DM}	28	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	330	mJ
	Repetitive (Note 2)	E_{AR}	7.5	mJ
Power Dissipation	TO-220F	P_D	30	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

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. Repetitive Rating : Pulse width limited by $T_{J(MAX)}$

3. L = 12.05mH, I_{AS} = 7.4A, V_{DD}=50V, R_G = 27 Ω, Starting T_J = 25°C

ATM7N65TF

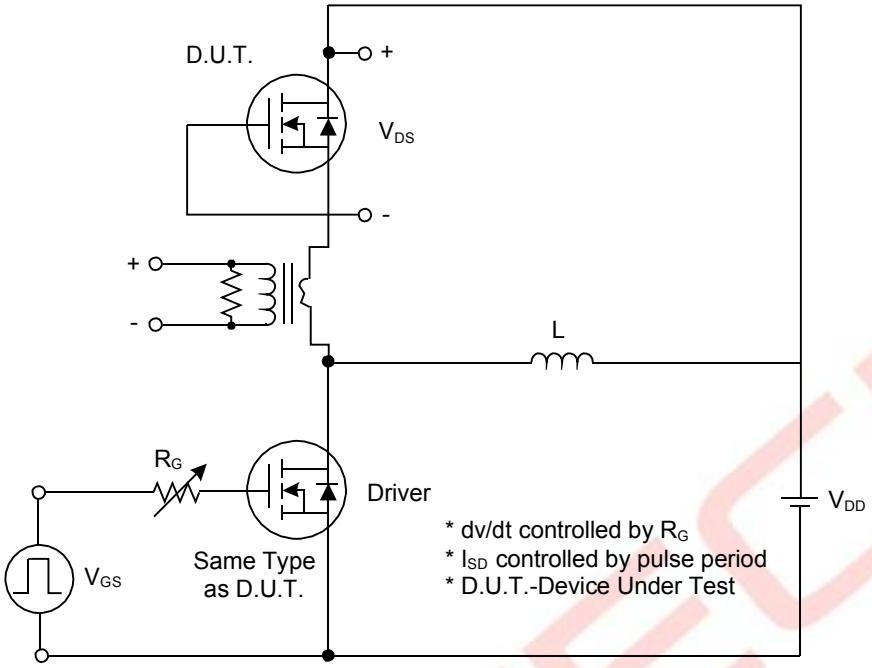
ELECTRICAL CHARACTERISTICS (T_C =25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS} = 0V, I_D = 250μA	650			V
Drain-Source Leakage Current		I_{DSS}	V_{DS} = 650V, V_{GS} = 0V			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	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS} = 10V, I_D =3.5A (Note 4)		1.05	1.4	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1.0 MHz		950	1430	pF
Output Capacitance		C_{OSS}			85	130	pF
Reverse Transfer Capacitance		C_{RSS}			12	18	pF
SWITCHING CHARACTERISTICS							
Turn-On Delay Time		$t_{D(ON)}$	V_{DD}=325V, I_D =7A, R_G =25Ω (Note 1, 2)		16		ns
Turn-On Rise Time		t_R			60		ns
Turn-Off Delay Time		$t_{D(OFF)}$			80		ns
Turn-Off Fall Time		t_F			65		ns
Total Gate Charge		Q_G	V_{DS}=520V, I_D=7A, V_{GS}=10 V (Note 1, 2)		28	42	nC
Gate-Source Charge		Q_{GS}			5.5	8.3	nC
Gate-Drain Charge		Q_{GD}			11	17	nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS} = 0V, I_S = 7A			1.4	V
Maximum Continuous Drain-Source Diode Forward Current		I_S				7	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				28	A
Reverse Recovery Time		t_{rr}	V_{GS} = 0V, I_S =7A, dI_F / dt = 100A/μs (Note 1)		365		ns
Reverse Recovery Charge		Q_{RR}			4.23		μC

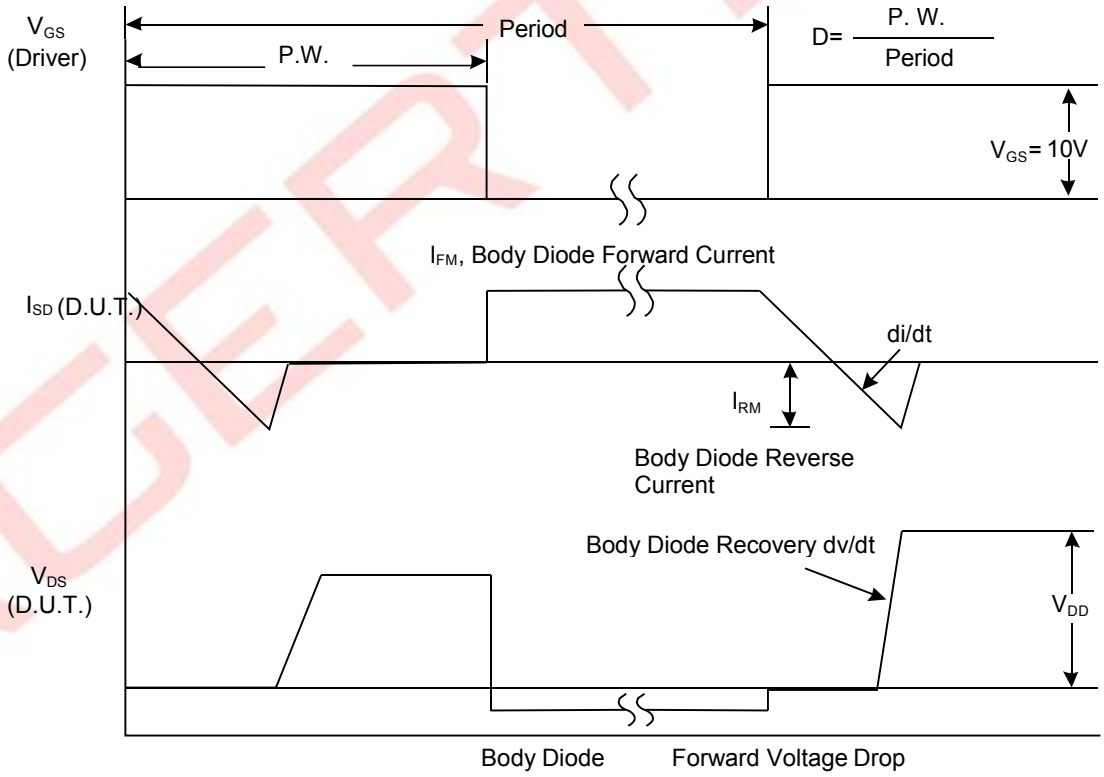
Notes: 1. Pulse Test: Pulse width ≤300μs, Duty cycle ≤2%

2.Essentially independent of operating temperature

TEST CIRCUITS AND WAVEFORMS

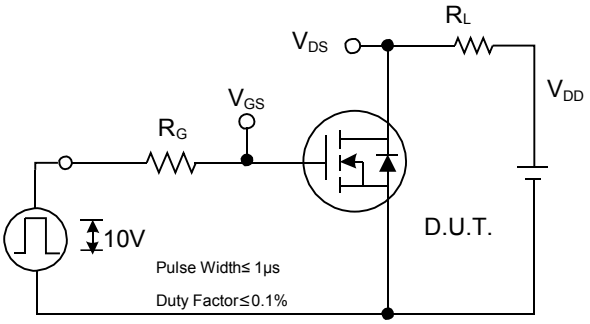


Peak Diode Recovery dv/dt Test Circuit

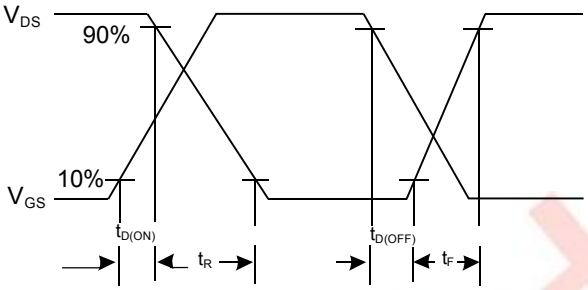


Peak Diode Recovery dv/dt Waveforms

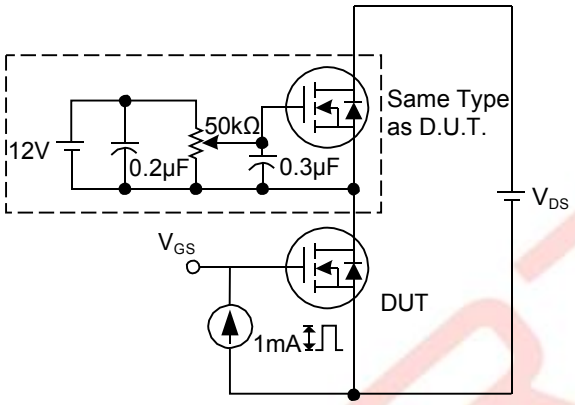
TEST CIRCUITS AND WAVEFORMS (Cont.)



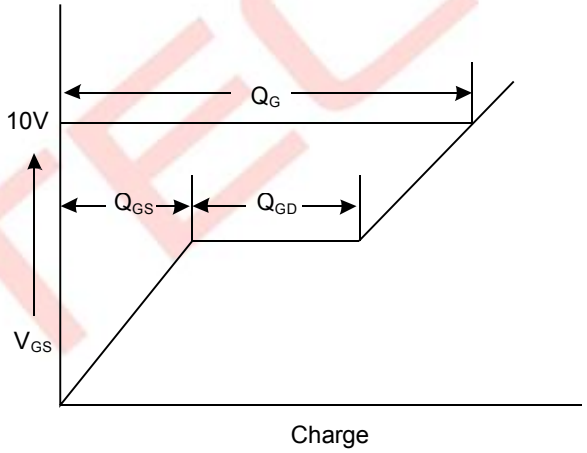
Switching Test Circuit



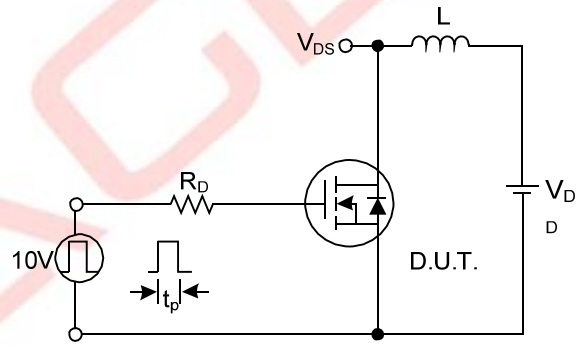
Switching Waveforms



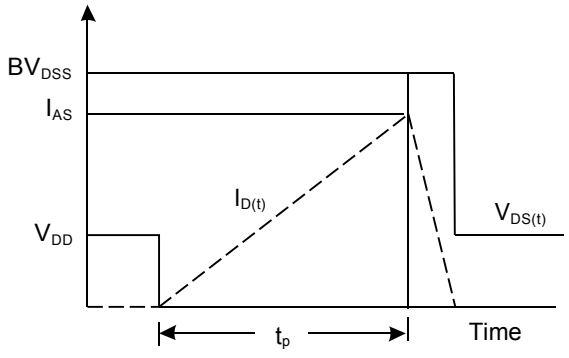
Gate Charge Test Circuit



Gate Charge Waveform



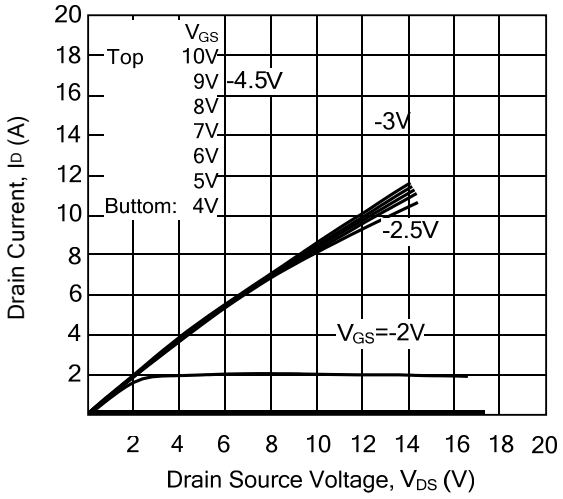
Unclamped Inductive Switching Test Circuit



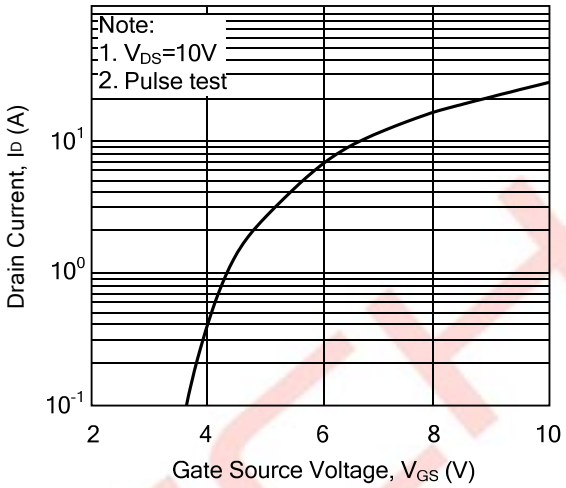
Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS CURVES

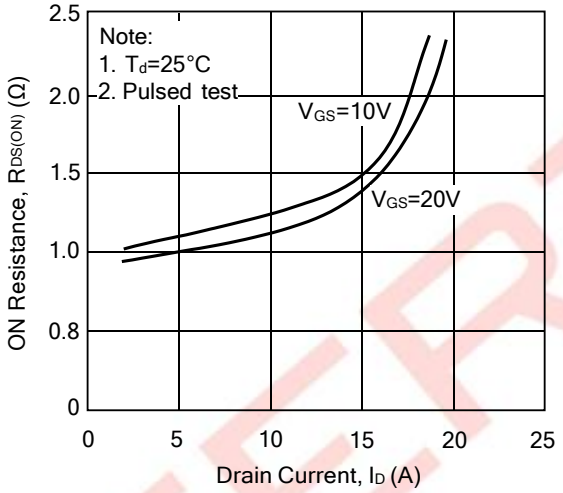
Drain Current vs. Drain-Source Voltage



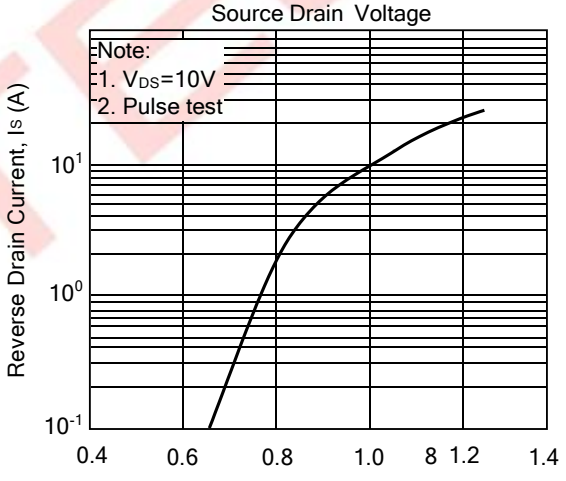
Drain Current vs. Gate-Source Voltage



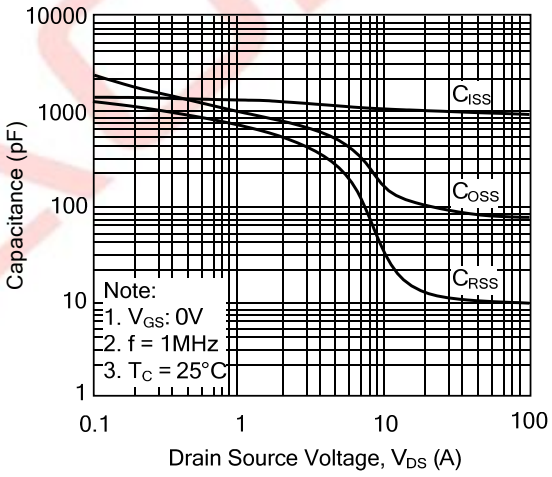
ON Resistance vs. Drain Current



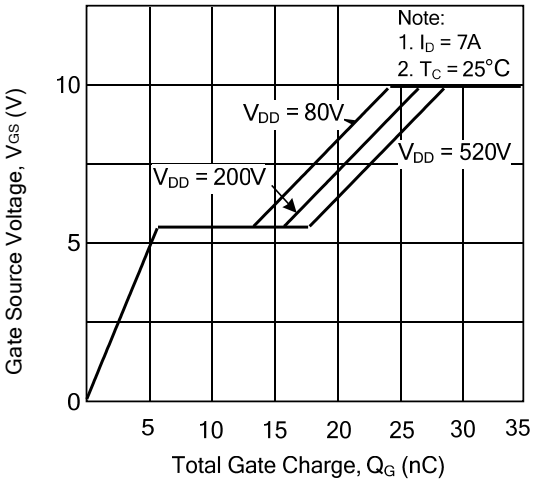
Reverse Drain Current vs. Source Drain Voltage



Capacitance vs. Drain Source Voltage

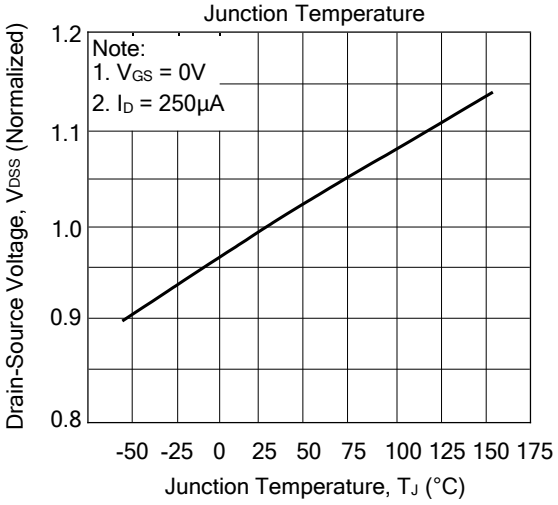


Gate Source Voltage vs. Total Gate Charge

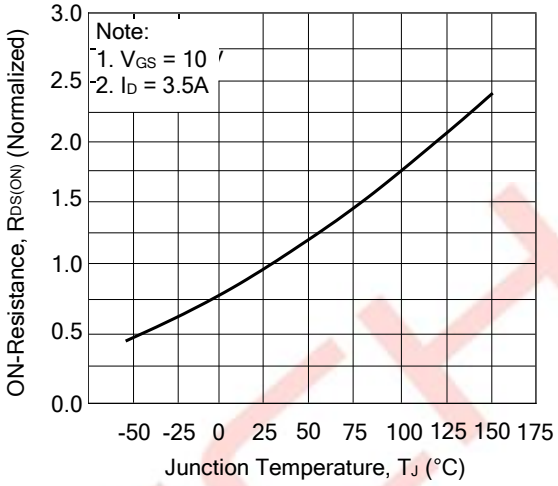


TYPICAL CHARACTERISTICS CURVES(Cont.)

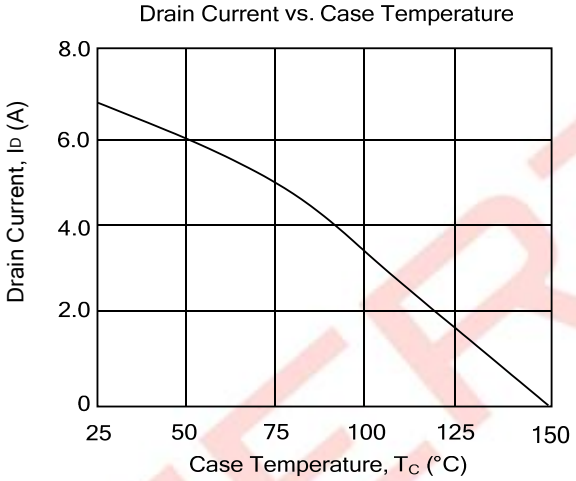
Drain-Source Voltage vs. Junction Temperature



ON-Resistance vs. Junction Temperature



Drain Current vs. Case Temperature



Safe Operating Area