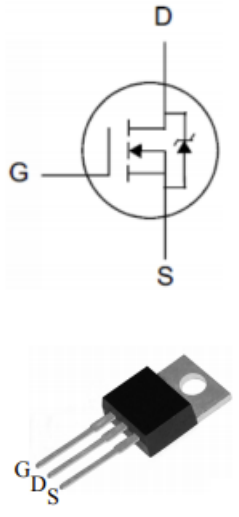
XTMT06N220F1

60V N-Channel MOSFET

Product Description

BV_{DSS}	60	V
I_D	220	A
$R_{DS(ON),Typ.}$	0.0021	Ω

封装 **Package**



TO-220

General Features

- Proprietary New Trench Technology
- $R_{DS(ON),typ.}$=2.1mΩ@V_{GS}=10V
- Fast Switching and High efficiency
- Low on-resistance

Applications

- High efficiency DC/DC Converters
- Motor Bridge Switch
- Oring FET/Load Switching

Device	Package	Marking
XTMT06N220F1	TO-220	XTMT06N220F1

Absolute Maximum Ratings T_j=25℃

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-to-Source Voltage	60	V
V_{GSS}	Gate-to-Source Voltage	±20	
I_D	Continuous Drain Current	220	A
	Continuous Drain Current	160	
	Continuous Drain Current @ Tc=100℃	139	
I_{DM}	Pulsed Drain Current at V_{GS}=10V	640	
E_{AS}	Single Pulse Avalanche Energy	800	mJ
P_D	Power Dissipation	254	W
	Derating Factor above 25℃	2.04	W

T_L T_{PAK}	Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	300 260	℃
T_J& T_{STG}	Operating and Storage Temperature Range	-55 to 150	

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	Value	Unit
		XTMF06N220F1	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.49	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	℃/W

Electrical Characteristics T_j=25℃

OFF Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
BV_{DSS}	Drain-to-Source Breakdown Voltage	60	-	-	V	V_{GS}=0V, I_D=250uA
I_{DSS}	Drain-to-Source Leakage Current	-	-	1	uA	V_{DS}=60V, V_{GS}=0V
		-	-	100		V_{DS}=48V, V_{GS}=0V, T_J=125℃
I_{GSS}	Gate-to-Source Leakage Current	-	-	+100	nA	V_{GS}=+20V, V_{DS}=0V
		-	-	-100		V_{GS}=-20V, V_{DS}=0V

ON Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	-	2.1	2.5	mΩ	V_{GS}=10V, I_D=20A
			2.8	4.0	mΩ	V_{GS}=4.5V, I_D=20A
$V_{GS(TH)}$	Gate Threshold Voltage	1.1	-	2.5	V	V_{DS}=V_{GS}, I_D=250uA

Dynamic Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
C_{iss}	Input Capacitance	-	5316	-	pF	V_{GS}=0V, V_{DS}=25V, f=1.0MHz
C_{rss}	Reverse Transfer Capacitance	-	149	-		
C_{oss}	Output Capacitance	-	2192	-		
Q_g	Total Gate Charge	-	115	-	nC	V_{DD}=50V, I_D=50A, V_{GS}=10V
Q_{gs}	Gate-to-Source Charge	-	15	-		
Q_{gd}	Gate-to-Drain (Miller) Charge	-	31	-		

Resistive Switching Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
$t_{d(ON)}$	Turn-on Delay Time	-	23.4	-	ns	V_{DD}=30V, I_D=25A, V_{GS}=10V R_G=2Ω
t_{rise}	Rise Time	-	17.4	-		
$t_{d(OFF)}$	Turn-Off Delay Time	-	72.3	-		
t_{fall}	Fall Time	-	28.8	-		

Source-Drain Body Diode Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
I_{SD}	Continuous Source Current[1]	-	-	100	A	Integral pn-diode in MOSFET
I_{SM}	Pulsed Source Current[1]	-	-	400		
V_{SD}	Diode Forward Voltage	-	0.85	1.2	V	I_S=50A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	-	82	-	ns	V_{GS}=0V I_F=25A, di/dt=100A/μs
Q_{rr}	Reverse Recovery Charge	-	83	-	uC	

[1] Pulse width≤380μs; duty cycle≤2%

Typical Characteristics

Fig 1: Output Characteristics

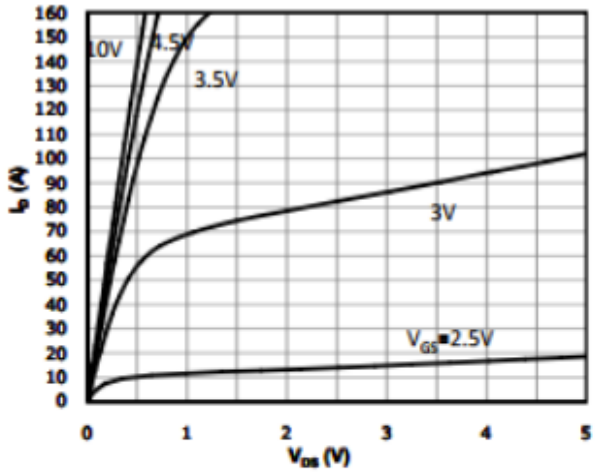


Fig 2: Transfer Characteristics

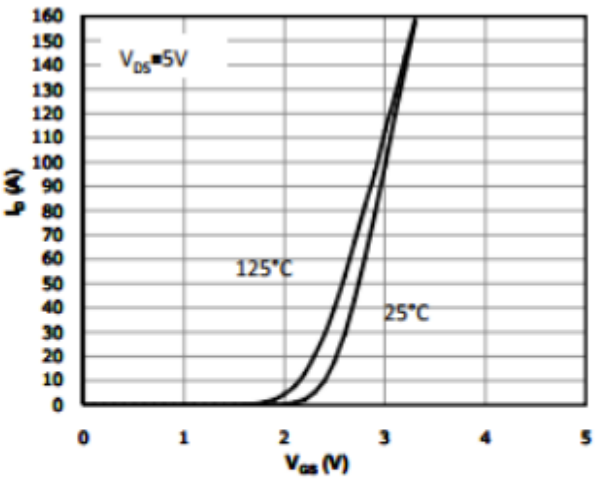


Fig 3: Rds(on) vs Drain Current and Gate Voltage

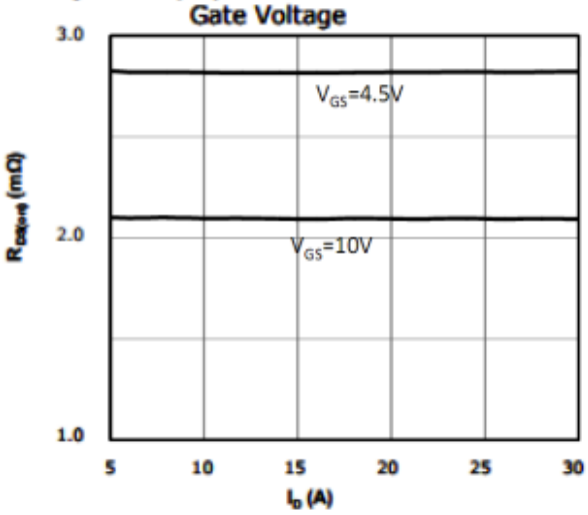


Fig 4: Rds(on) vs Gate Voltage

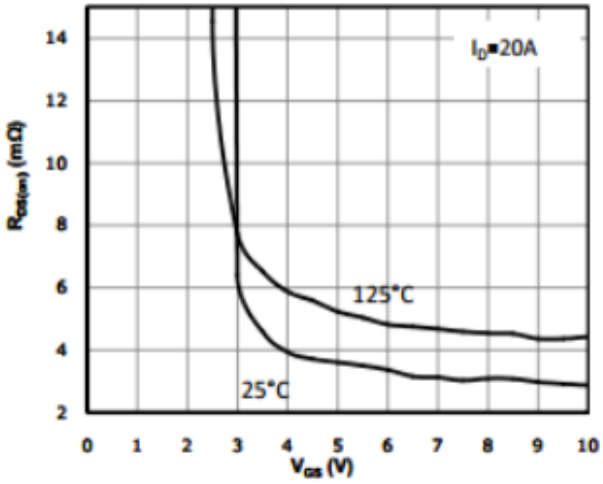


Fig 5: Rds(on) vs. Temperature

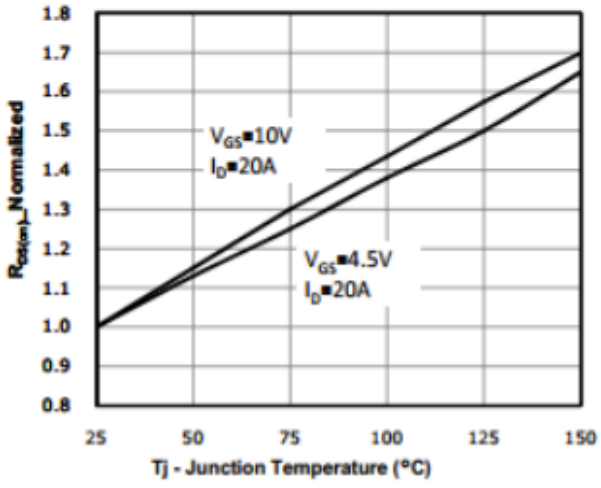
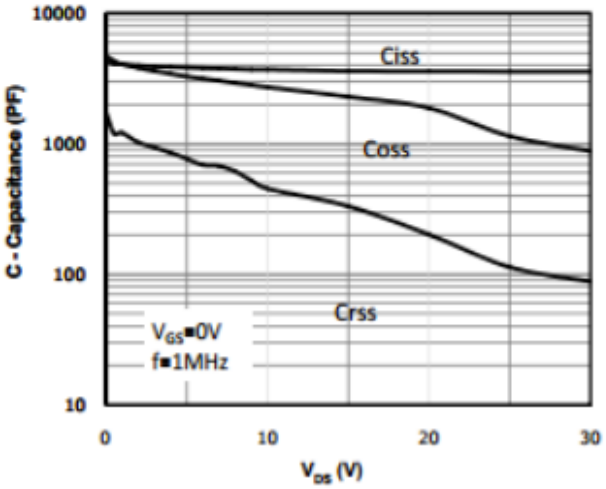


Fig 6: Capacitance Characteristics



Typical Characteristics(Cont.)

Fig 7: Gate Charge Characteristics

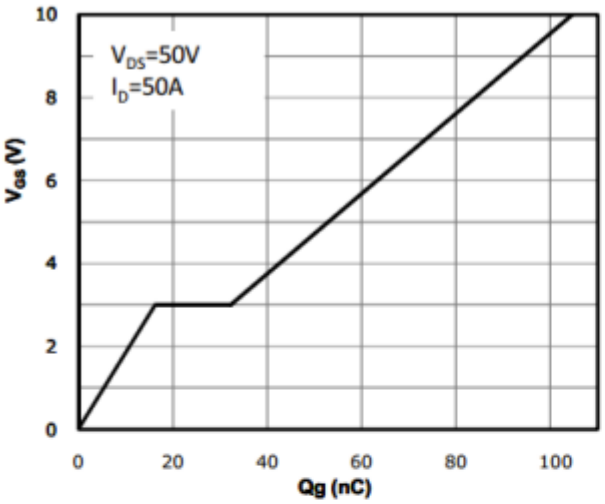


Fig 8: Body-diode Forward Characteristics

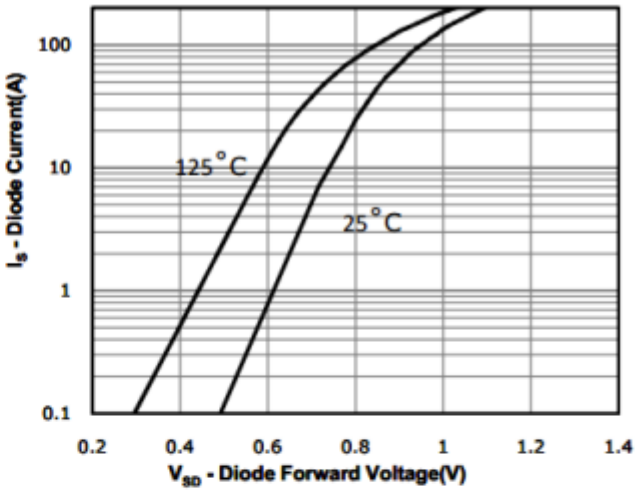


Fig 9: Power Dissipation

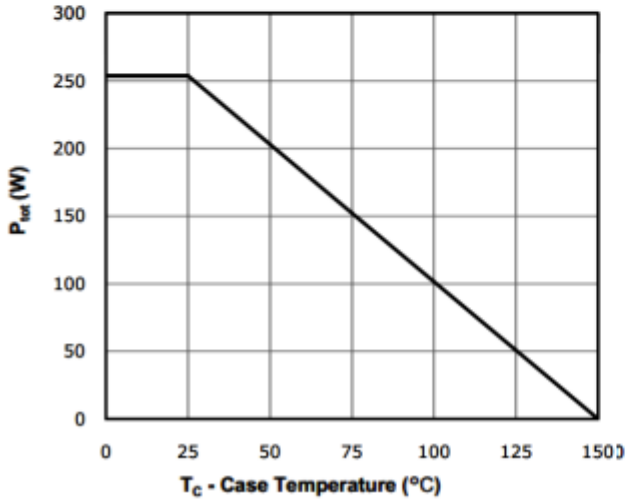
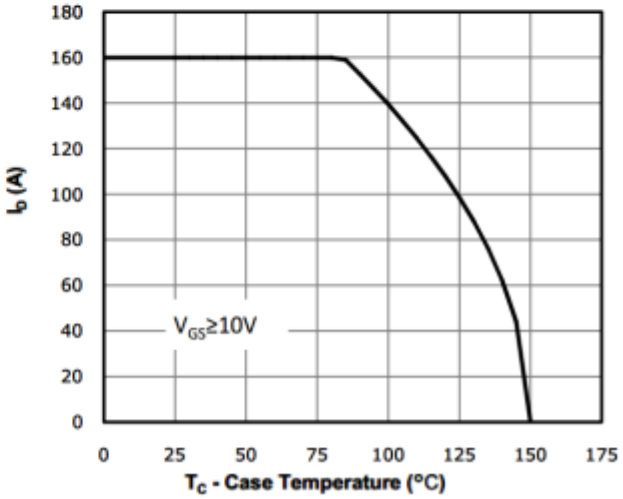


Fig 10: Drain Current Derating



Test Circuits and Waveforms

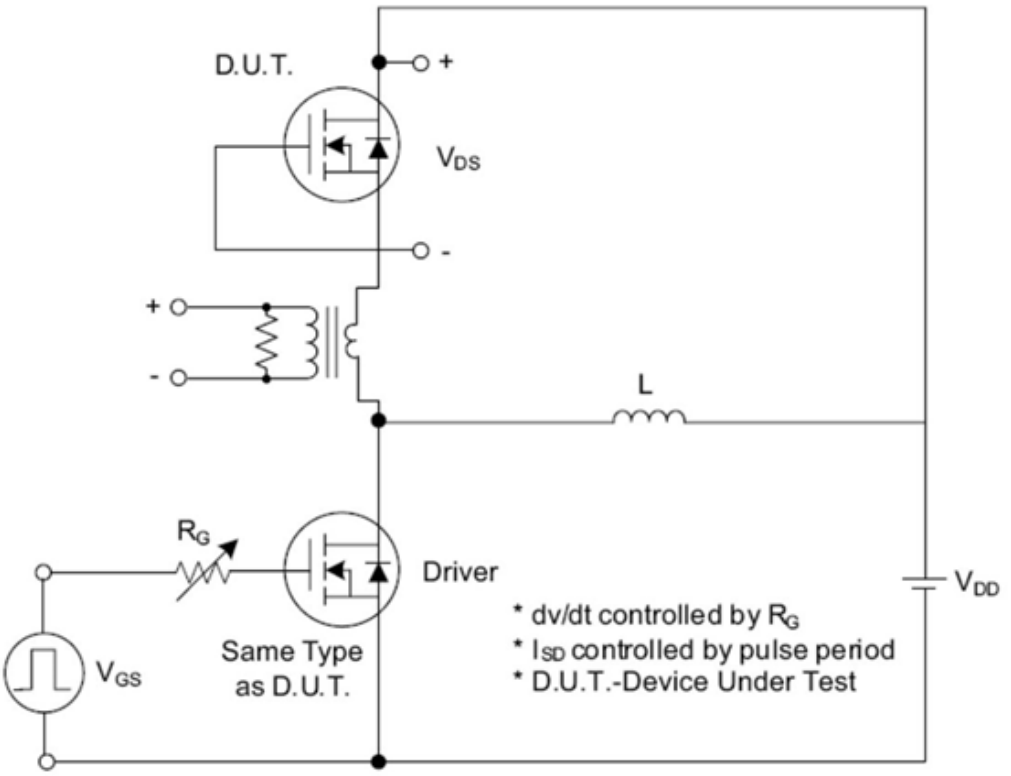


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

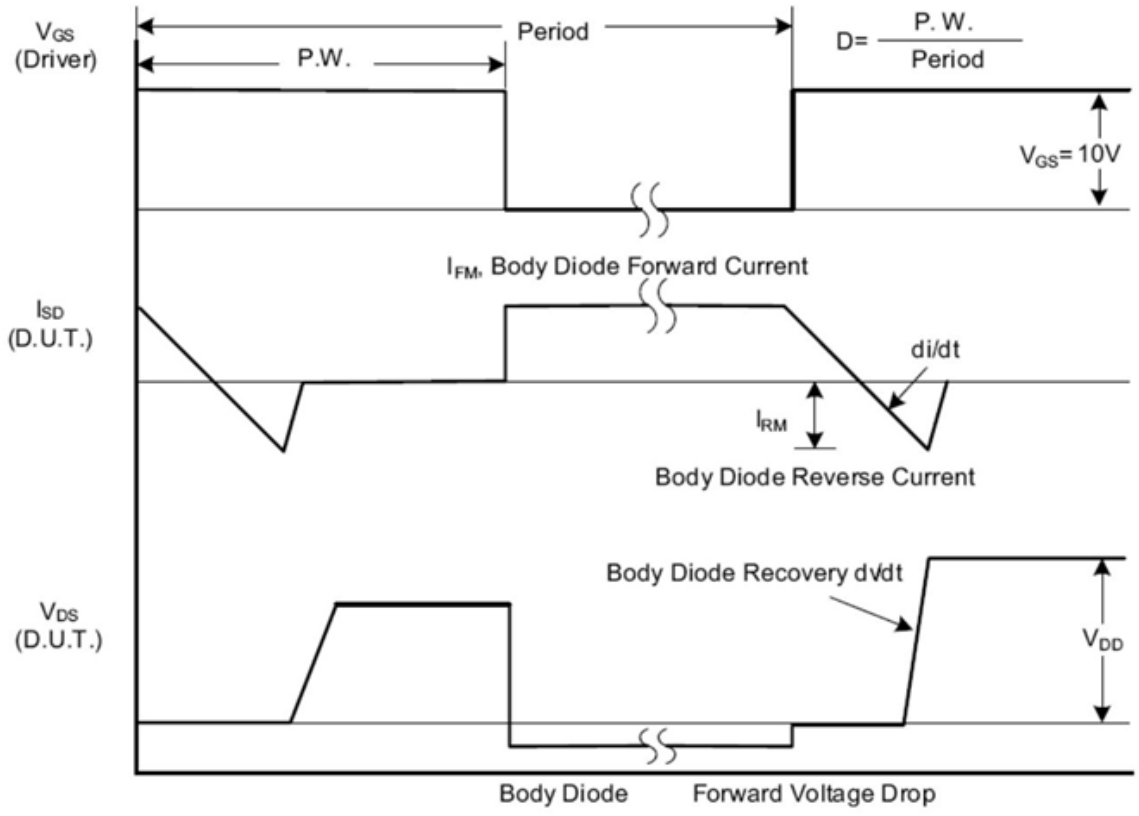


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

Test Circuits and Waveforms (Cont.)

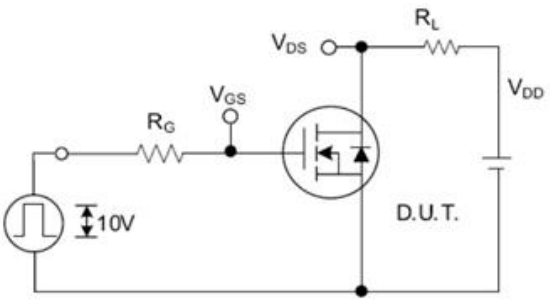


Fig. 2.1 Switching Test Circuit

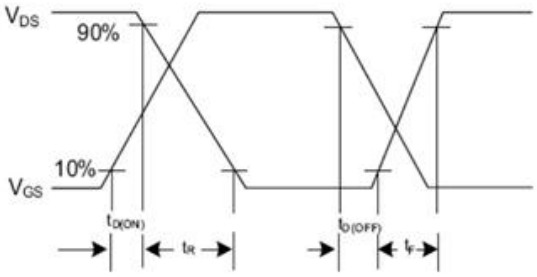


Fig. 2.2 Switching Waveforms

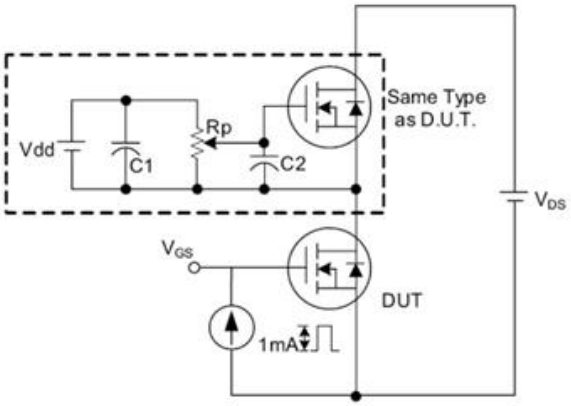


Fig. 3 . 1 Gate Charge Test Circuit

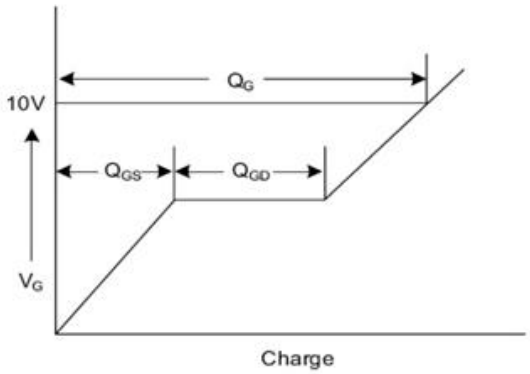


Fig. 3 . 2 Gate Charge Waveform

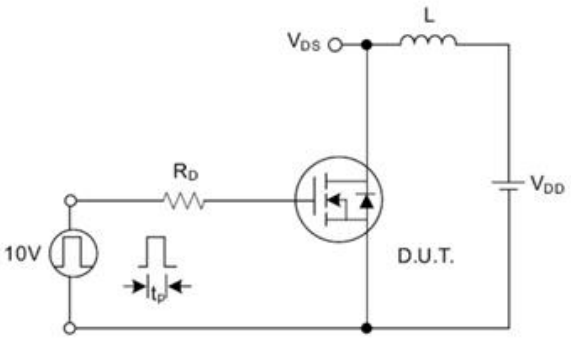


Fig. 4.1 Unclamped Inductive Switching Test Circuit

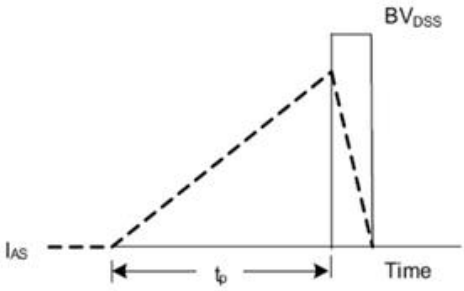


Fig. 4.2 Unclamped Inductive Switching Waveforms