



XTMT10N28M
XTMT10N28D

XTMT10N28M(D)

100V N-Channel MOSFET

Product Description

BV_{DSS}	100	V
I_D	28	A
$R_{DS(ON),Typ.}$	0.017	Ω

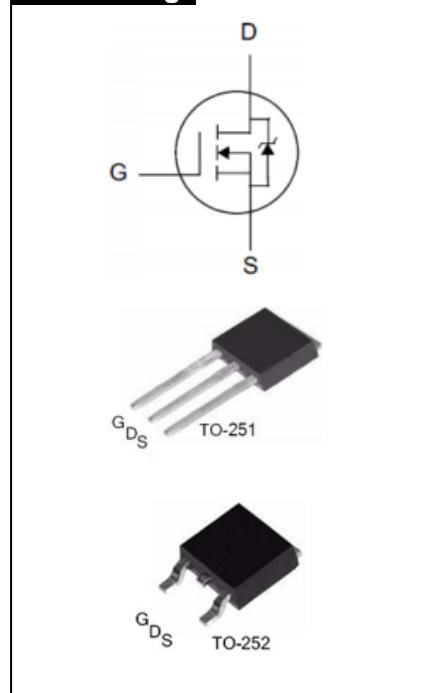
General Features

- Proprietary New Planar Technology
- $R_{DS(ON),typ.}=17\text{ m}\Omega@V_{GS}=10\text{V}$
- Fast Recovery Body Diode
- Low Gate Charge Minimize Switching Loss

Applications

- Synchronous Rectification
- UPS Inverter

封装 Package



Device	Package	Marking
XTMT10N28M	TO-251	XTMT10N28M
XTMT10N28D	TO-252	XTMT10N28D

Absolute Maximum Ratings $T_j=25^\circ\text{C}$

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-to-Source Voltage	100	V
V_{GSS}	Gate-to-Source Voltage	± 20	
I_D	Continuous Drain Current	28	A
I_{DM}	Pulsed Drain Current at $V_{GS}=10\text{V}$	112	
E_{AS}	Single Pulse Avalanche Energy	100	mJ
P_D	Power Dissipation	140	W
	Derating Factor above 25°C	1.12	W/ $^\circ\text{C}$
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	$^\circ\text{C}$
$T_J \& T_{STG}$	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
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.89	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	75	$^{\circ}C/W$

Electrical Characteristics $T_j=25^{\circ}C$

OFF Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
BV_{DSS}	Drain-to-Source Breakdown Voltage	100	-	-	V	$V_{GS}=0V, I_D=250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	-	-	1	uA	$V_{DS}=100V, V_{GS}=0V$
		-	-	100		$V_{DS}=80V, V_{GS}=0V, T_J=125^{\circ}C$
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	-	17	20	m Ω	$V_{GS}=10V, I_D=14A$
		-	23	30		$V_{GS}=4.5V, I_D=14A$
$V_{GS(TH)}$	Gate Threshold Voltage	1.1	2	2.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
gfs	Forward Transconductance	-	29	-	S	$V_{DS}=5V, I_D=15A$



Dynamic Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
C_{iss}	Input Capacitance	-	930	-	pF	$V_{GS}=0V$, $V_{DS}=50V$, $f=1.0MHz$
C_{rss}	Reverse Transfer Capacitance	-	4	-		
C_{oss}	Output Capacitance	-	152	-		
Q_g	Total Gate Charge	-	19	-	nC	$V_{DD}=50V$, $I_D=14A$, $V_{GS}=0$ to 10V
Q_{gs}	Gate-to-Source Charge	-	4	-		
Q_{gd}	Gate-to-Drain (Miller) Charge	-	4	-		

Resistive Switching Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
$t_{d(ON)}$	Turn-on Delay Time	-	4	-	ns	$V_{DD}=50V$, $I_D=14A$, $V_{GS}=10V$ $R_g=2.2\Omega$
t_{rise}	Rise Time	-	19	-		
$t_{d(OFF)}$	Turn-Off Delay Time	-	22	-		
t_{fall}	Fall Time	-	7	-		

Source-Drain Body Diode Characteristics

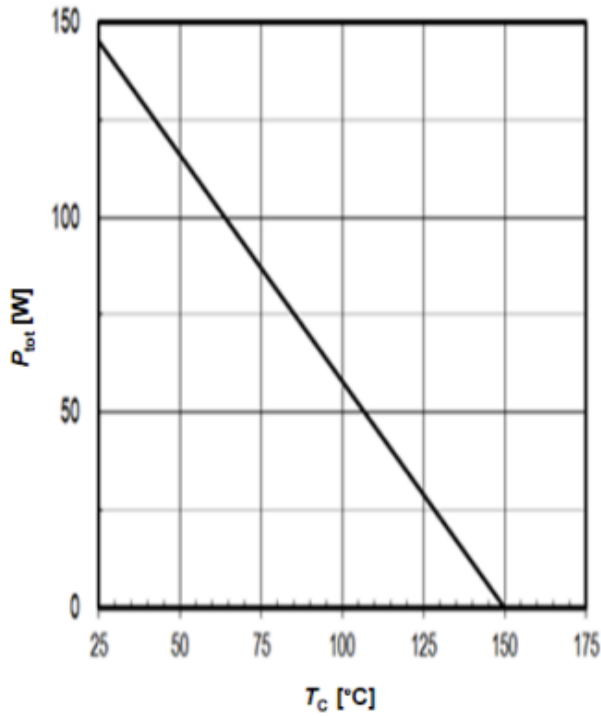
Symbol	Parameter	Min	Typ	Max	Unit	Test Condition
I_{SD}	Continuous Source Current ^[1]	-	-	28	A	Integral pn-diode in MOSFET
I_{SM}	Pulsed Source Current ^[1]	-	-	112		
V_{SD}	Diode Forward Voltage	-	-	1.2	V	$I_S=14A$, $V_{GS}=0V$
t_{rr}	Reverse Recovery Time	-	35	-	ns	$I_F=14A$, $di_F/dt=100A/\mu s$
Q_{rr}	Reverse Recovery Charge	-	40	-	uC	

[1] Pulse width $\leq 380\mu s$; duty cycle $\leq 2\%$

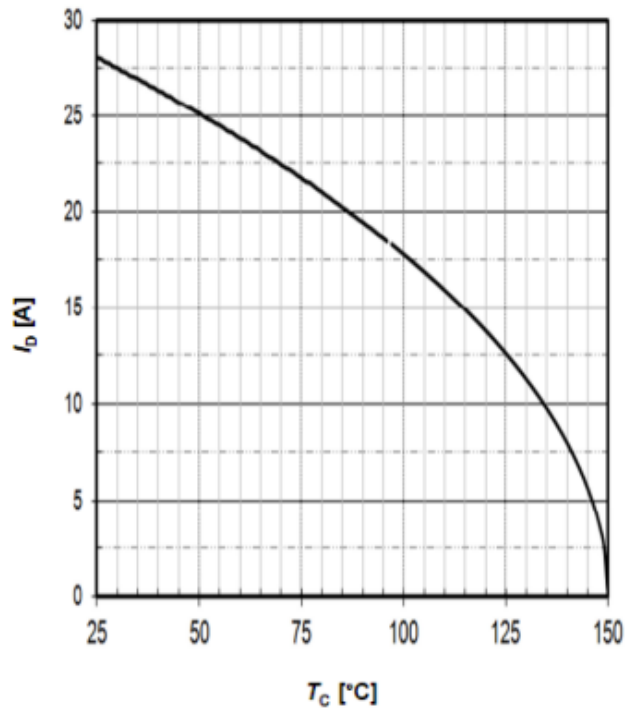


Typical Characteristics

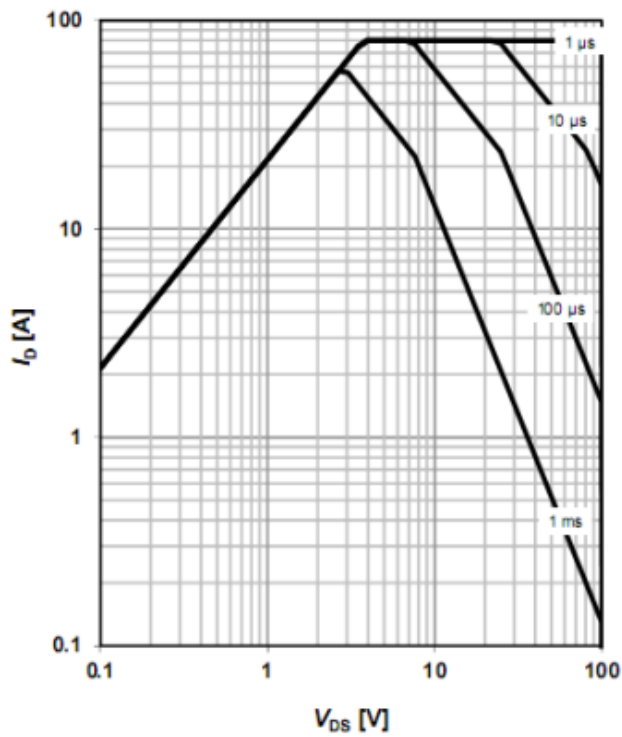
1 Power dissipation



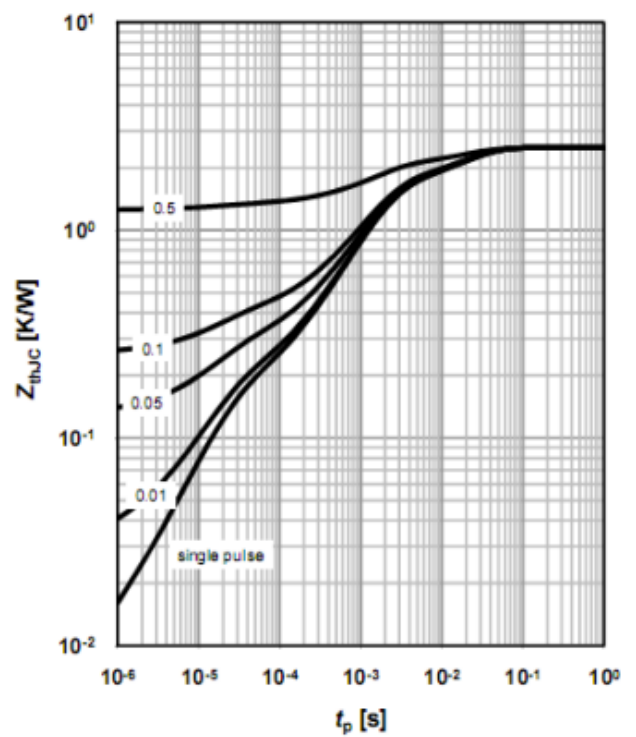
2 Drain current



3 Safe operating area



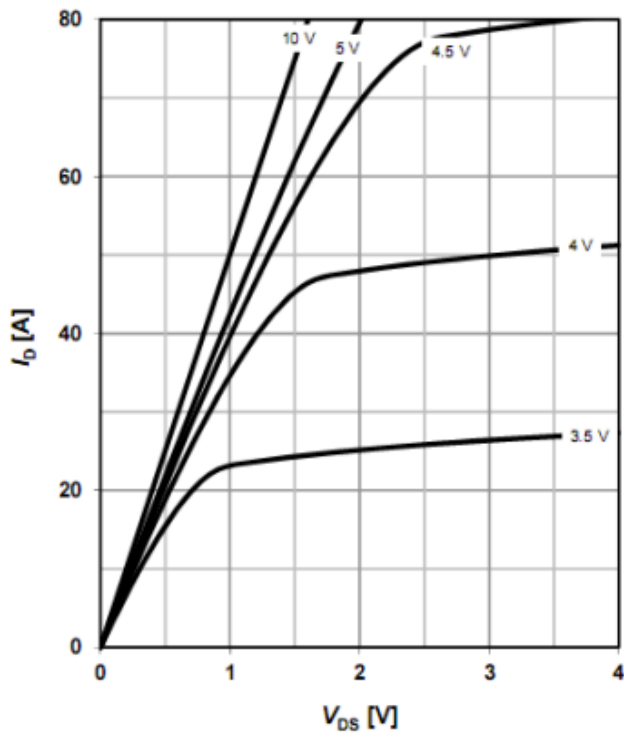
4 Max. transient thermal impedance



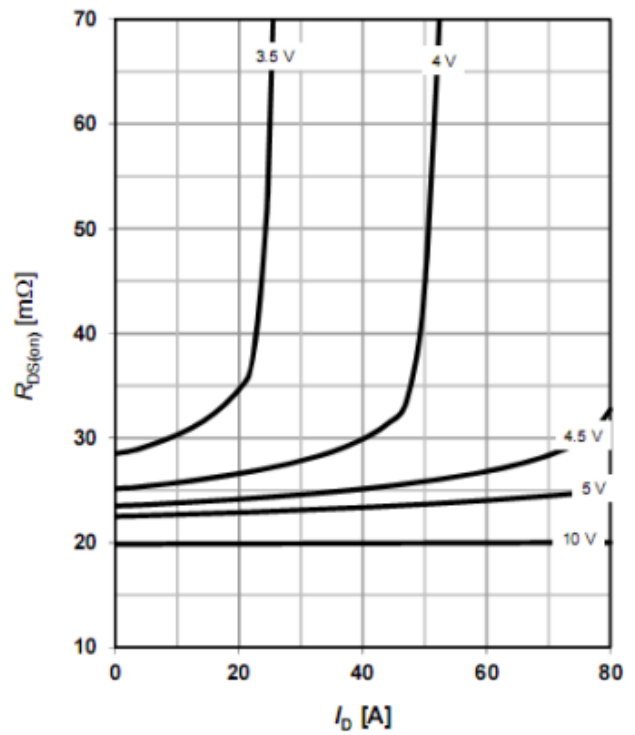


Typical Characteristics(Cont.)

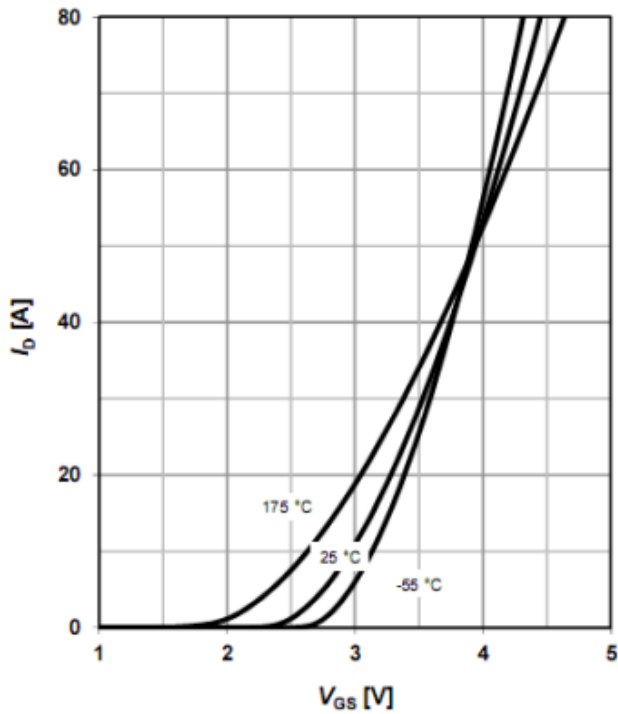
5 Typ. output characteristics⁵⁾



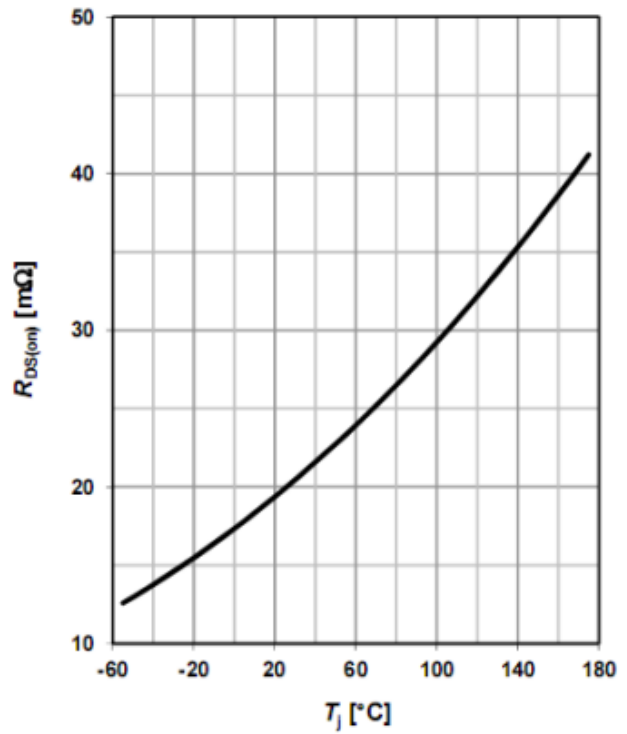
6 Typ. drain-source on-state resistance⁵⁾



7 Typ. transfer characteristics⁵⁾



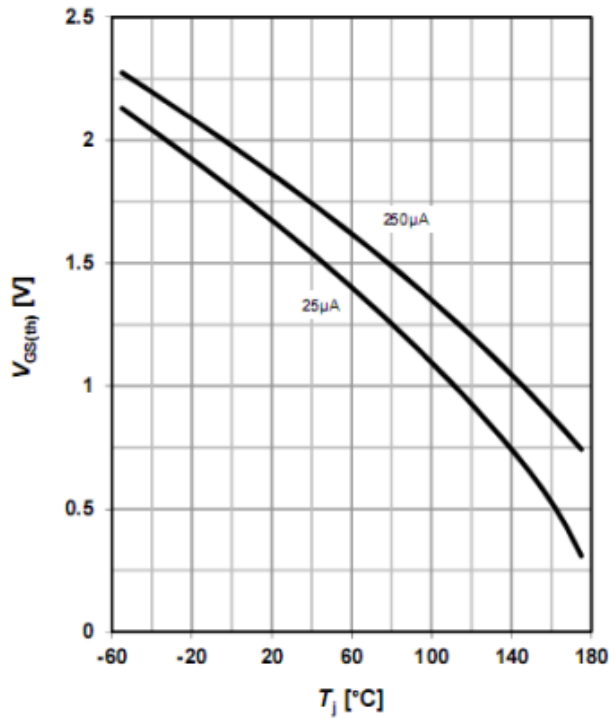
8 Typ. drain-source on-state resistance⁵⁾



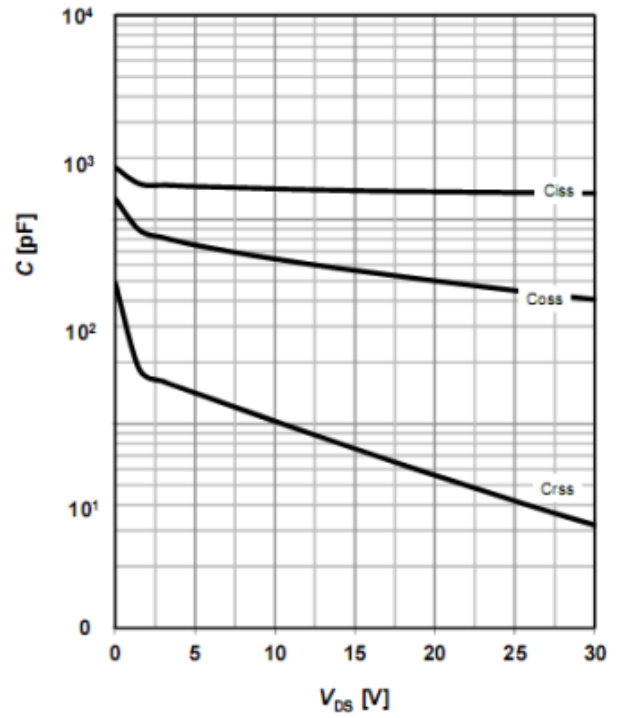


Typical Characteristics(Cont.)

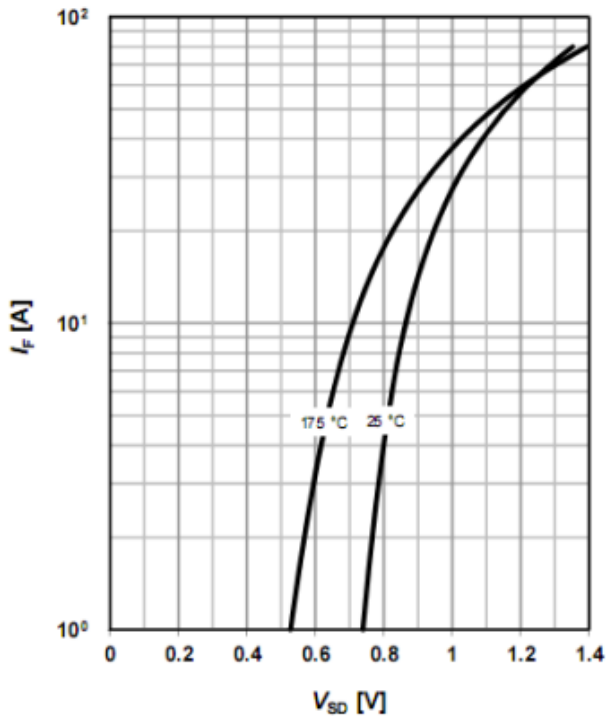
9 Typ. gate threshold voltage



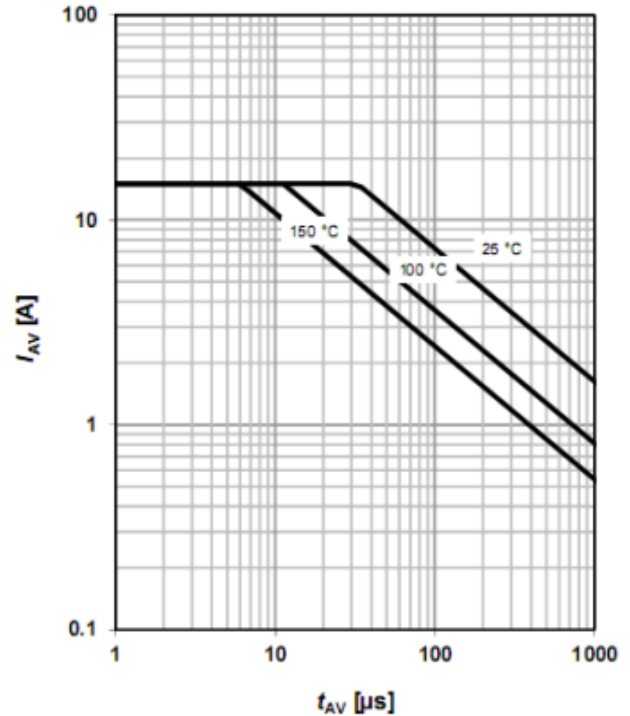
10 Typ. Capacitances⁵⁾



11 Typical forward diode characteristics⁵⁾



12 Avalanche characteristics⁵⁾





Test Circuits and Waveforms

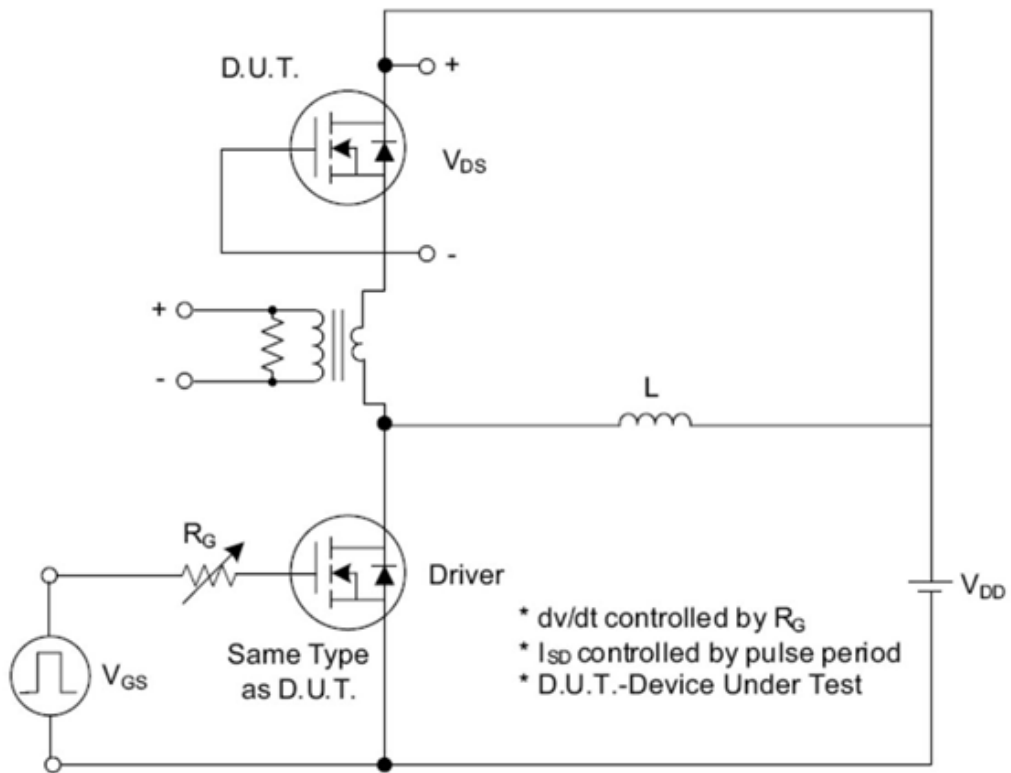


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

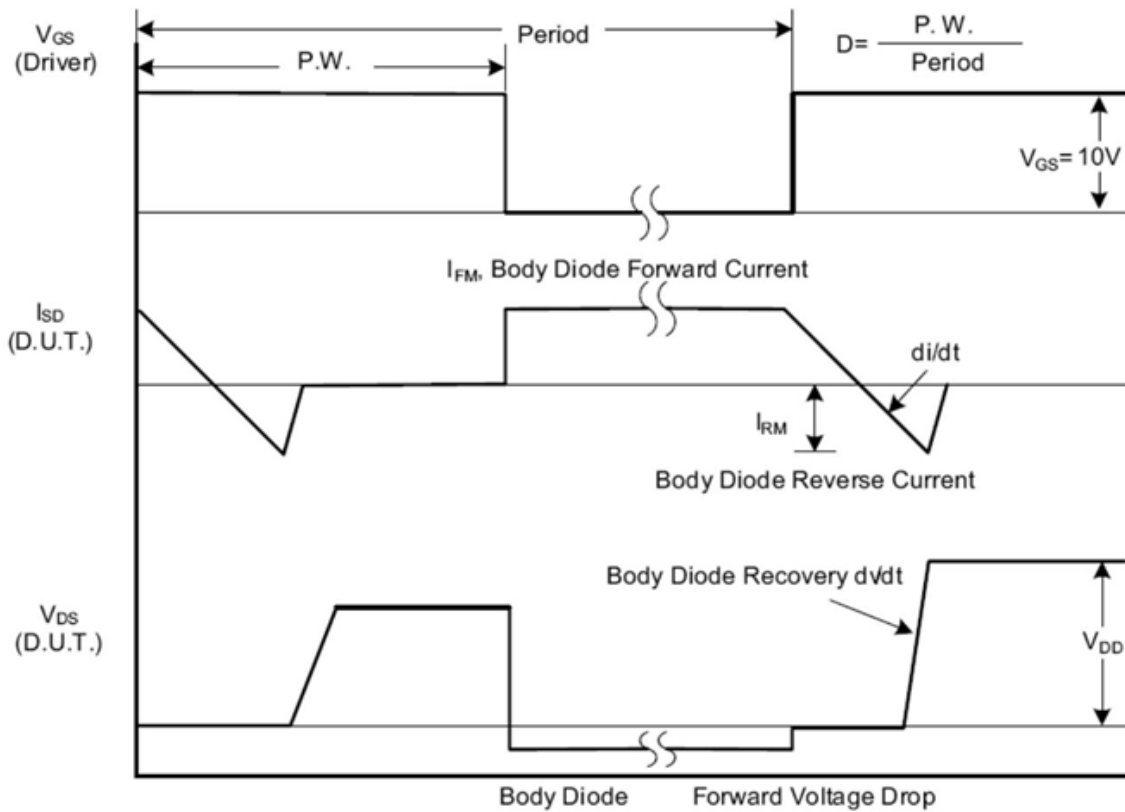


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms



Test Circuits and Waveforms (cont.)

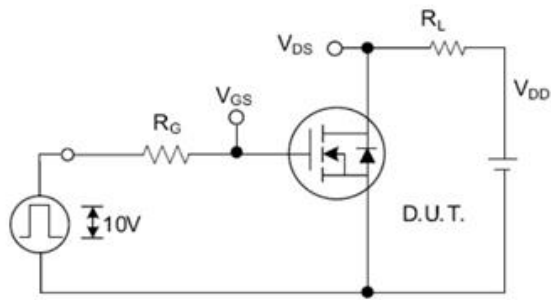


Fig. 2.1 Switching Test Circuit

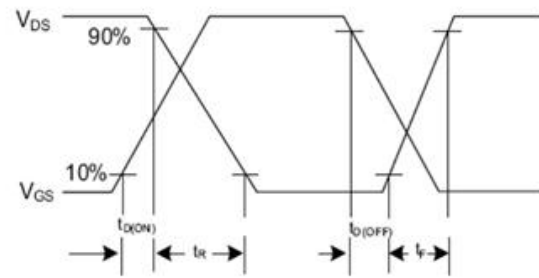


Fig. 2.2 Switching Waveforms

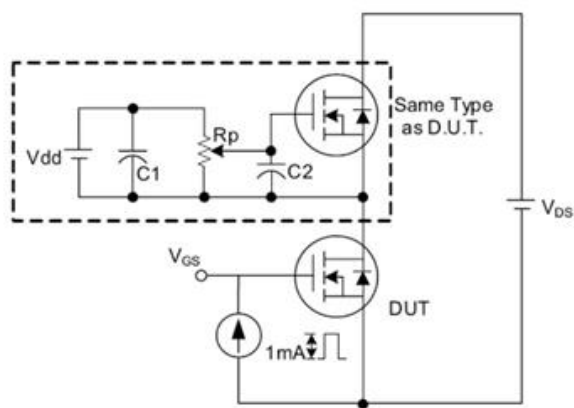


Fig. 3.1 Gate Charge Test Circuit

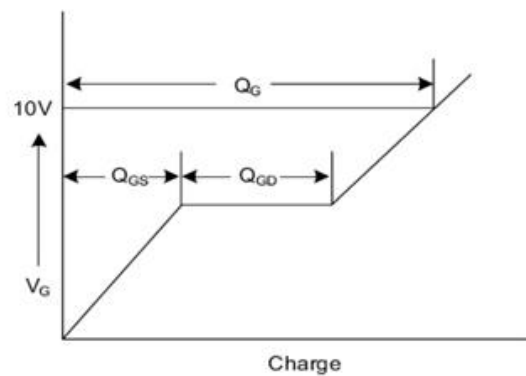


Fig. 3.2 Gate Charge Waveform

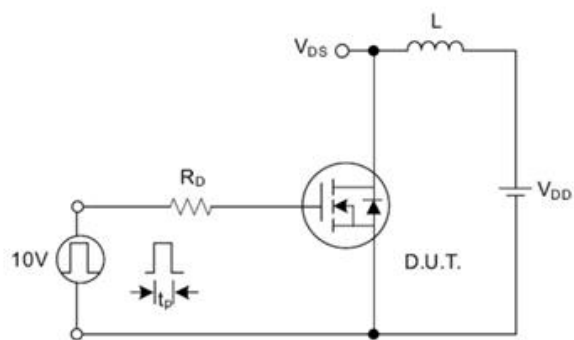


Fig. 4.1 Unclamped Inductive Switching Test Circuit

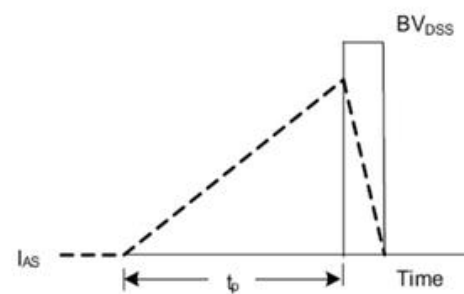


Fig. 4.2 Unclamped Inductive Switching Waveforms