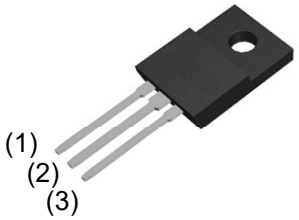
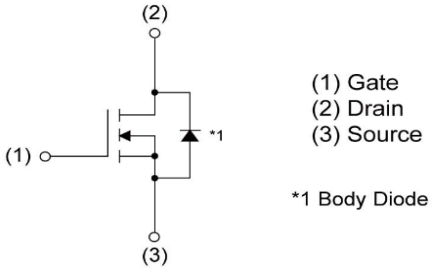
Features

- N-channel,Normal Level.
- Low Crss
- Low gate charge
- Reliable and Rugged
- 100% avalanche tested
- Fast switching
- Improved dv/dt capability
- Pb-free lead plating; RoHS compliant
- Moisture Sensitivity Level MSL1



TO-220F View



Schematic Diagram

Applications

- AC/DC Power Conversion in Switched Mode Power Supplies (SMPS).
- Uninterruptible Power Supply (UPS).
- Adapter.
- Motor Driver .

Product Summary

Parameter	Value	Unit
V_{DS}	650	V
I_D	10	A
$R_{DS(ON)}$(typ.)	0.6	Ω

Order information

Product Name	Package	Media	Quantity (pcs)
XPXF10N65	TO-220F	Tube	50

Marking information

Marking	F10N65	**Lot code**	IPWWWYY
	IPWWWYY		

Absolute maximum ratings (at T_j = 25°C ,unless otherwise specified)

Symbol	Parameter	Test Condition	Values			Unit
			Min.	Typ.	Max.	
V_{DS}	Drain-Source Voltage	-	650	-	-	V
V_{GS}	Gate-Source Voltage	-	-30	-	30	V
I_D	Drain Current -Continuous	T_C= 25°C	-	-	10	A
	Drain Current -Continuous	T_C= 100°C	-	-	6.3	A
I_{DP} [a]	Drain Current -Pulsed	T_C= 25°C	-	-	40	A
P_D	Maximum Power Dissipation	T_C= 25°C	-	-	26	W
I_{AS} [a]	Avalanche Current	-	-	-	10	A
E_{AS} [a]	Repetitive Avalanche Energy	-	-	-	480	mJ
T_{stg}	Storage Temperature	-	-55	-	150	℃
Tj	Maximum Junction Temperature	-	-	-	150	℃
TL	Maximum lead temperature for soldering purposes,1/8" from case for 5 seconds	-	-	-	300	℃
dv/dt	Peak Diode Recovery dv/dt	-	-	-	5	V/ns

Thermal characteristics

Symbol	Parameter	Test Condition	Values			Unit
			Min.	Typ.	Max.	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	Steady State	-	-	43.6	℃/W
$R_{\theta JC}$ [c]	Thermal Resistance-Junction to Lead	Steady State	-	-	4.58	℃/W

Note a：Pulse width is limited by max. junction temperature.

Note b：UIS tested and pulse width limited by maximum junction temperature (initial temperature Tj=25℃).

Note c：Surface mounted on 1in^2 pad area.

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Test Condition	Values			Unit
			Min	Typ	Max	
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V,V_{GS}=0V,Tj=25℃	-	-	1	μA
		V_{DS}=650V,V_{GS}=0V,Tj=85℃	-	-	30	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±30V,V_{DS}=0V	-	-	±10	μA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.0	3.0	4.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=5A	-	0.60	0.72	Ω
g_{fs}	Forward Transconductance	V_{DS}=40V, I_D=5A	-	12	-	S
Dynamic Characteristics [e]						
C_{lss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	1189	-	PF
C_{oss}	Output Capacitance		-	164	-	PF
C_{rss}	Reverse Transfer Capacitance		-	4.1	-	PF
Switching Characteristics [e]						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=335V, I_D=10A, V_{GS}=10V, R_G=25Ω.	-	14	-	nS
t_r	Turn-on Rise Time		-	27	-	nS
$t_{d(off)}$	Turn-Off Delay Time		-	61	-	nS
t_f	Turn-Off Fall Time		-	33	-	nS
Q_g	Total Gate Charge	V_{DS}=536V, I_D=10A, V_{GS}=10V.	-	25		nC
Q_{gs}	Gate-Source Charge		-	5.2	-	nC
Q_{gd}	Gate-Drain Charge		-	9.7	-	nC
Drain-Source Diode Characteristics						
V_{SD} [d]	Diode Forward Voltage	V_{GS}=0V,Is=10A	-	-	1.2	V
I_S	Diode Forward Current	T_J=25°C	-	-	10	A
trr [e]	Reverse Recovery Time	T_J=25°C, Is=10A, di/dt =100A/μs	-	382	-	nS
Qrr [e]	Reverse Recovery Charge		-	3.1	-	μC

Note d：Pulse test ; pulse width≤300μs, duty cycle≤2%.

Note e：Guaranteed by design, not subject to production testing.

Note f：L=10mH,IAS=10A,VDD=50V,RG=25R,Starting Tj=25℃.

Typical Electrical and Thermal Characteristics

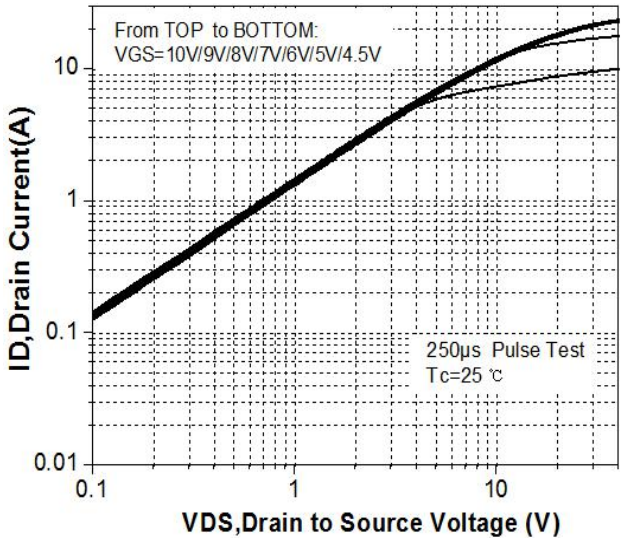


Figure 1. On-Region Characteristics

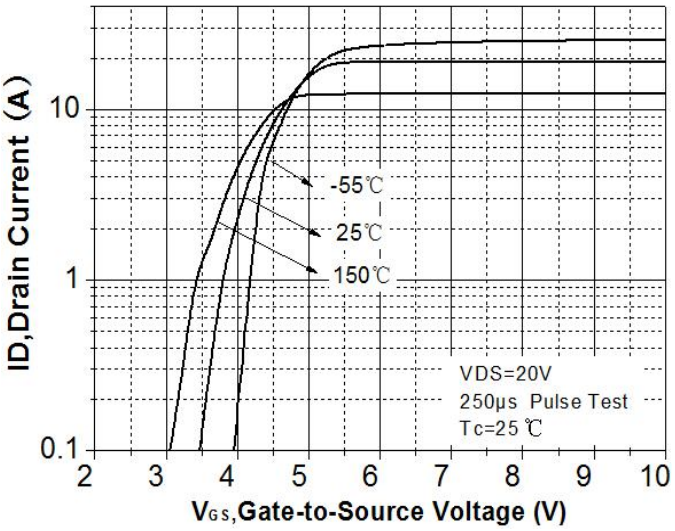


Figure 2. Transfer Characteristics

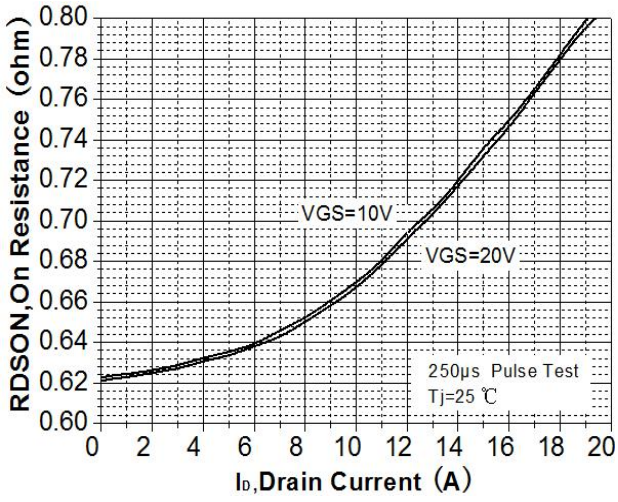


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

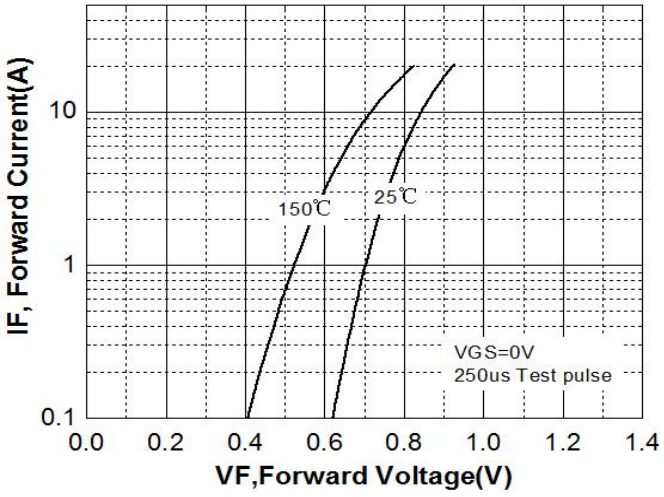


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

Typical Electrical and Thermal Characteristics

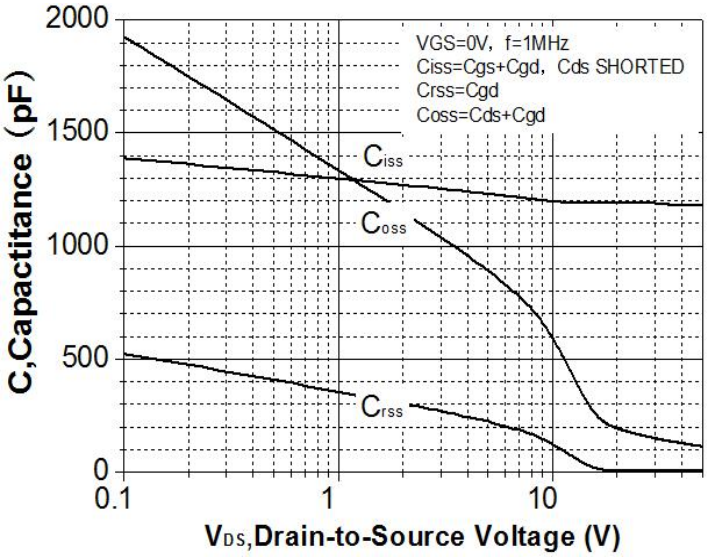


Figure 5. Capacitance Characteristics

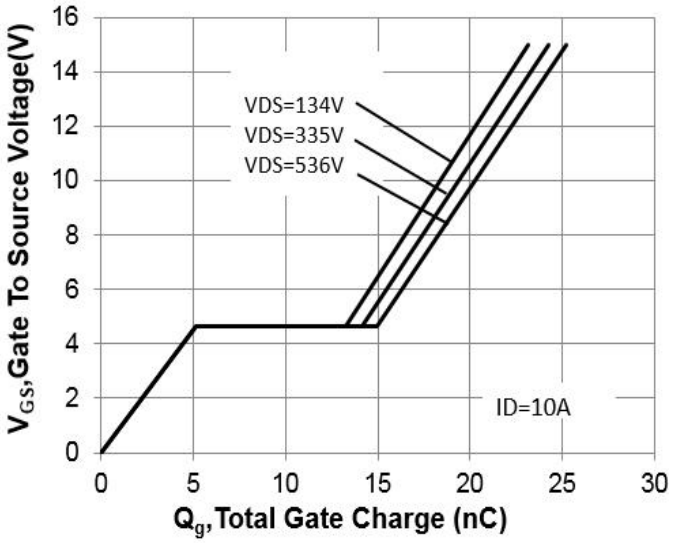


Figure 6. Gate Charge Characteristics

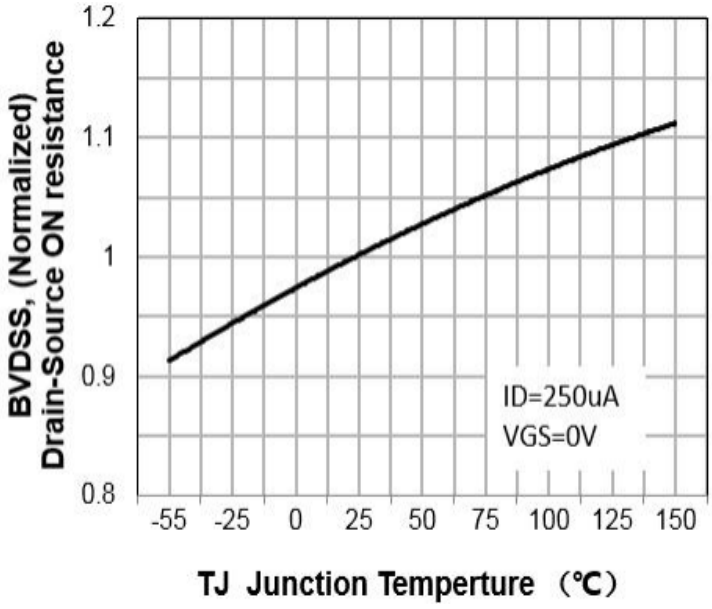


Figure 7. Breakdown Voltage Variation vs Temperature

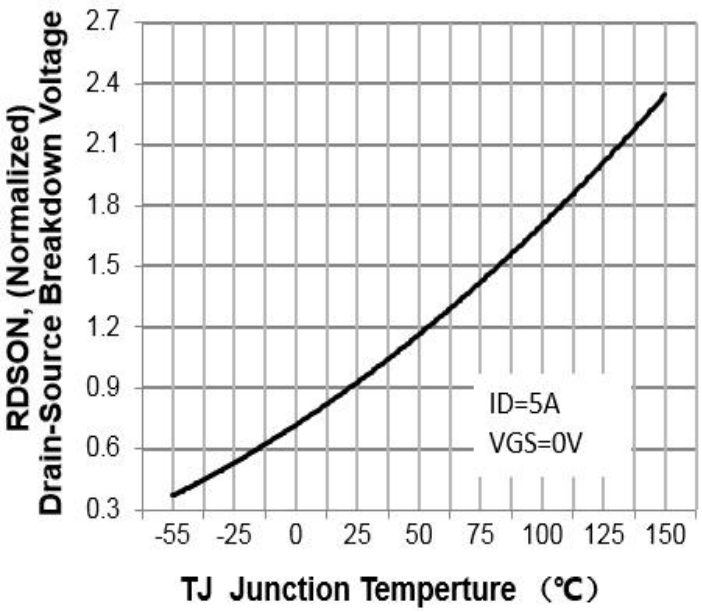


Figure 8. On-Resistance Variation vs Temperature

Typical Electrical and Thermal Characteristics

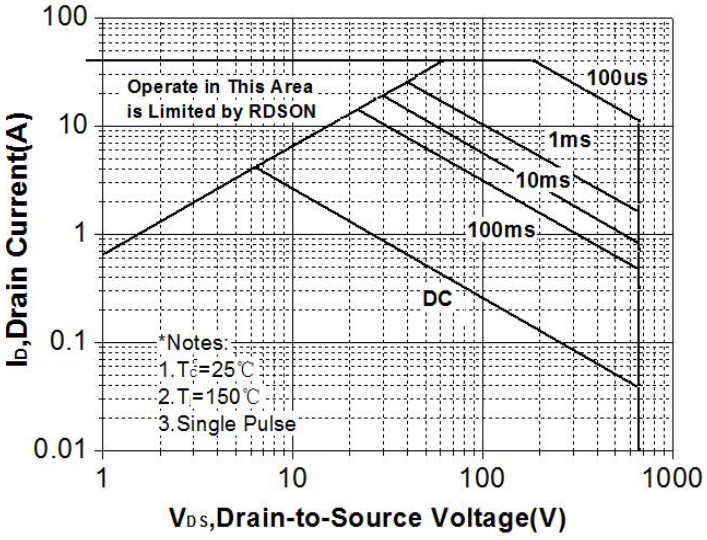


Figure 9. Maximum Safe Operating Area

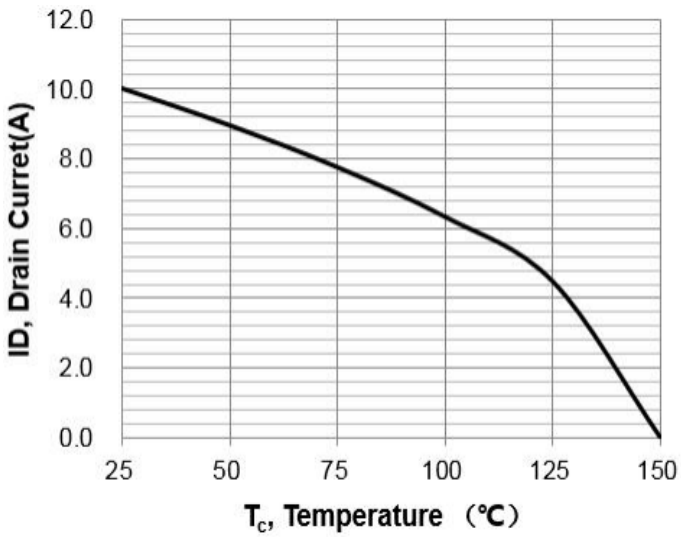


Figure 10. Maximum Drain Current vs Case Temperature

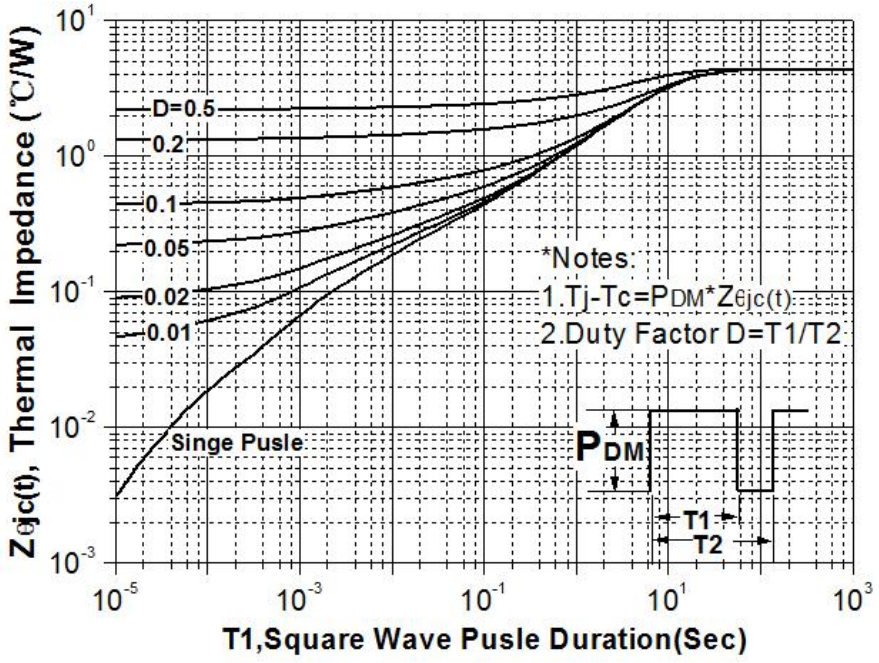
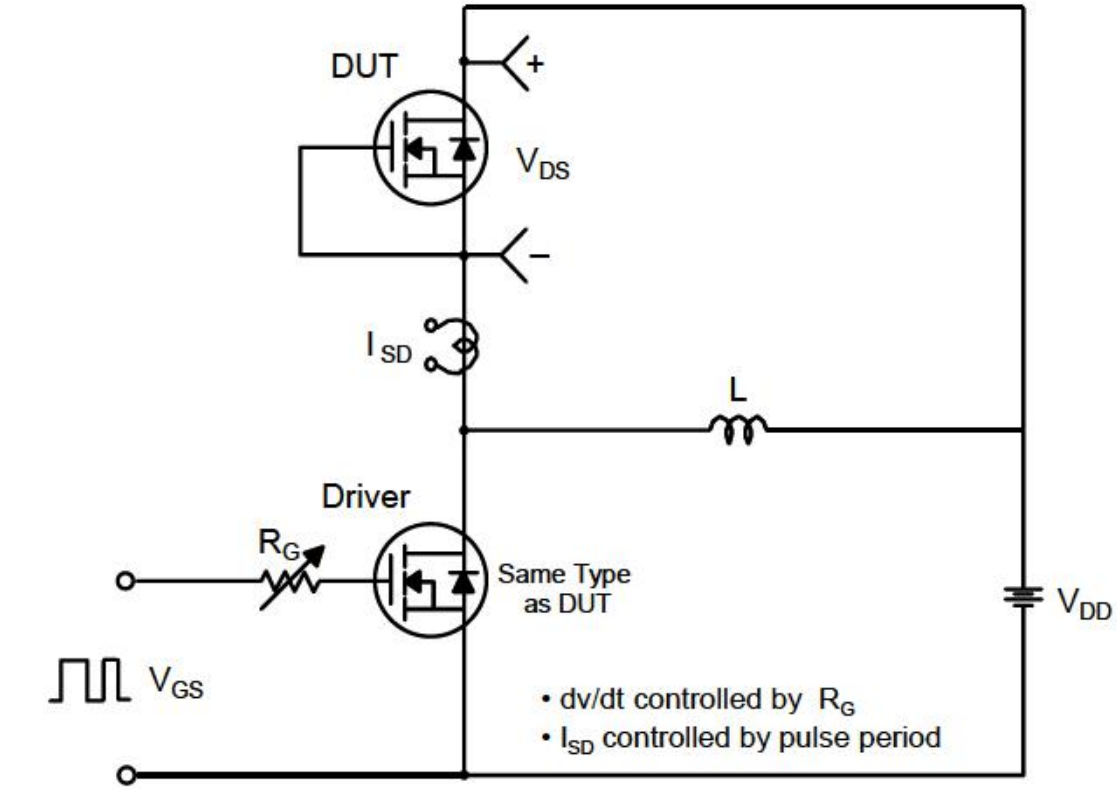
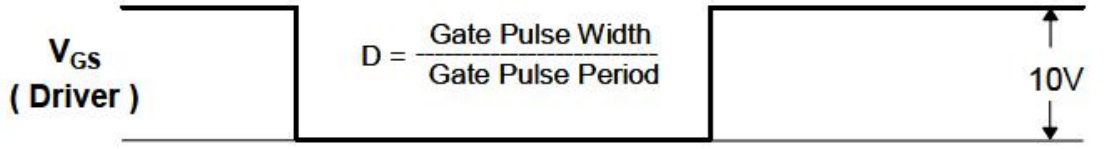
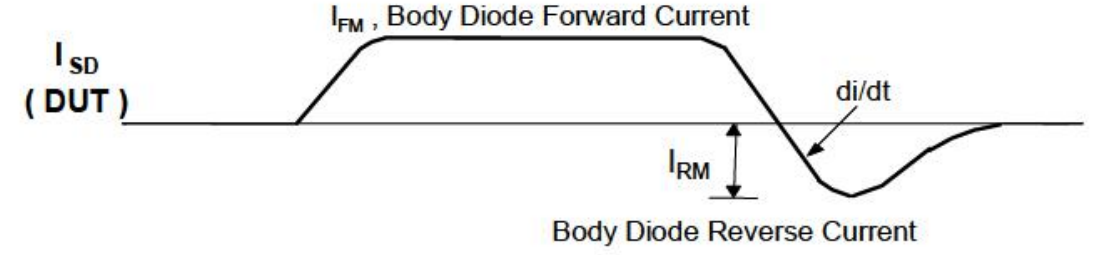


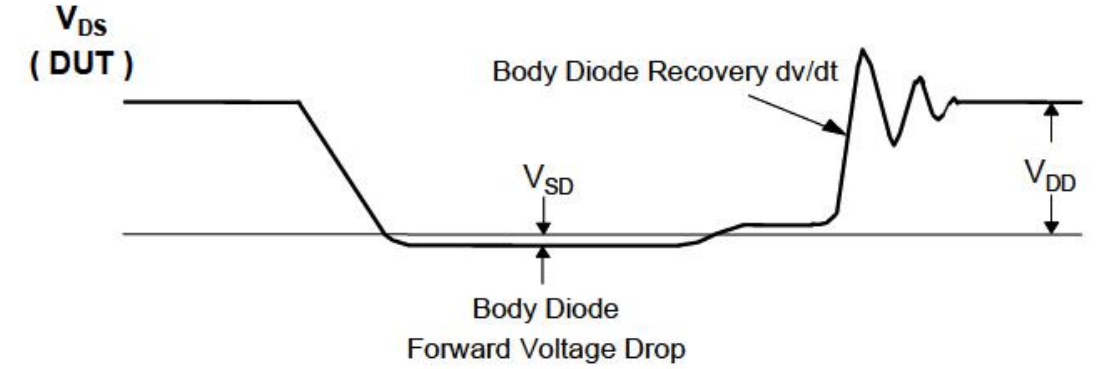
Figure 11. Transient Thermal Response Curve

Peak Diode Recovery dv/dt Test Circuit & Waveforms

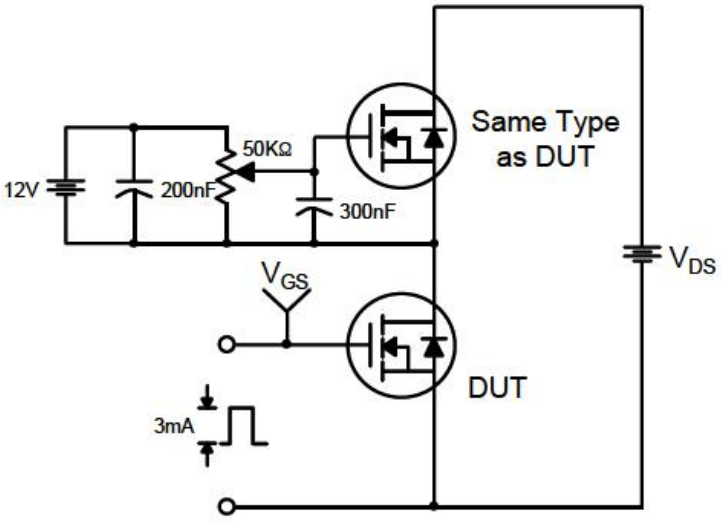


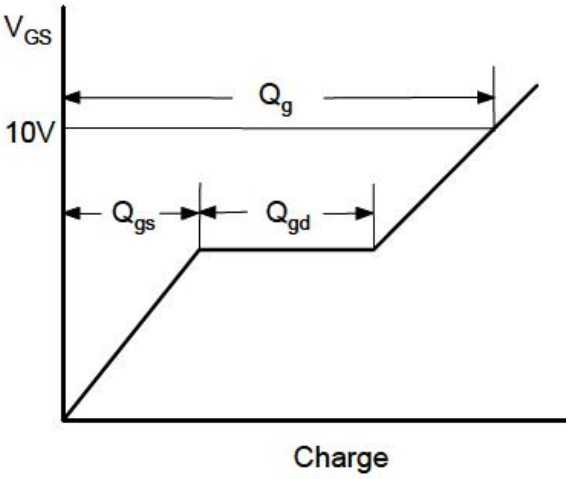




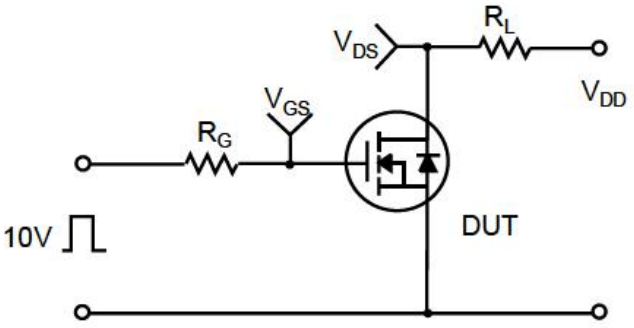


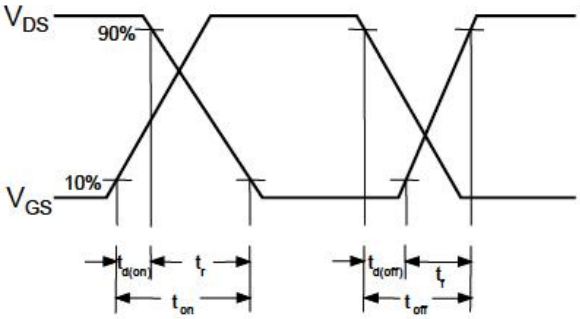
Gate Charge Test Circuit & Waveform



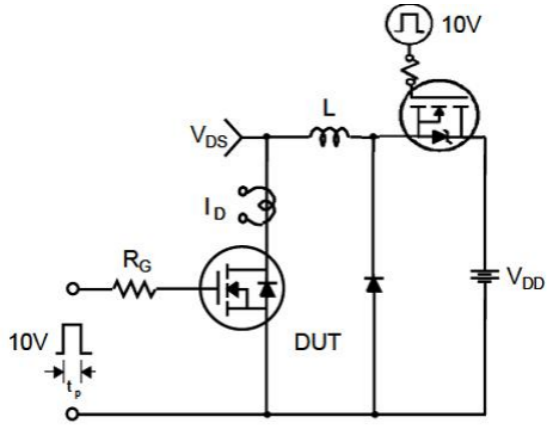


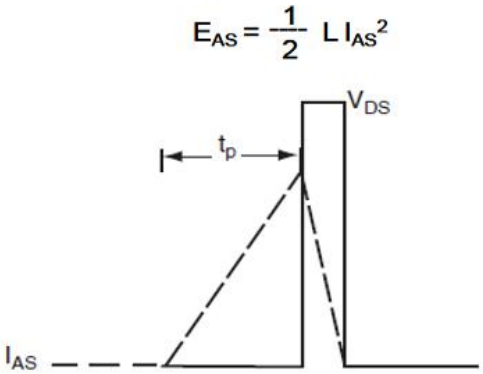
Resistive Switching Test Circuit & Waveforms





Unclamped Inductive Switching Test Circuit & Waveforms





TO-220F Package information