



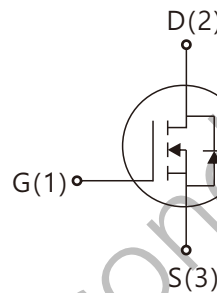
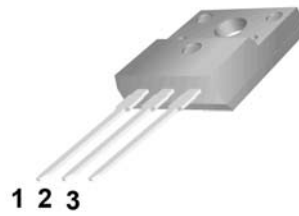
**WGF10N60SE**

**Features:**

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge :Qg=35nC (Typ.).
- BVDS=600 V, I<sub>D</sub>=10A
- R<sub>DS(on)</sub> : 0.8 Ω (Max) @V<sub>G</sub>=10V
- 100% Avalanche Tested



TO-220F



- 1.Gate (G)
- 2.Drain (D)
- 3.Source (S)

**Absolute Maximum Ratings** (Ta=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V <sub>DSS</sub>	Drain-Source Voltage	600	V
I <sub>D</sub>	Drain Current	T <sub>j</sub> =25°C	10
		T <sub>j</sub> =100°C	6.7
V <sub>GSS</sub>	Gate-Source Voltage	30	V
E <sub>AS</sub>	Single Pulse Avalanche Energy (note1)	380	mJ
I <sub>AR</sub>	Avalanche Current (note2)	10	A
P <sub>D</sub>	Power Dissipation (T <sub>j</sub> =25°C)	65	W
T <sub>j</sub>	Junction Temperature(Max)	150	°C
T <sub>stg</sub>	Storage Temperature	-55~+150	°C
TL	Maximum lead temperature for soldering purpose,1/8' from case for 5 seconds	300	°C

**Thermal Characteristics**

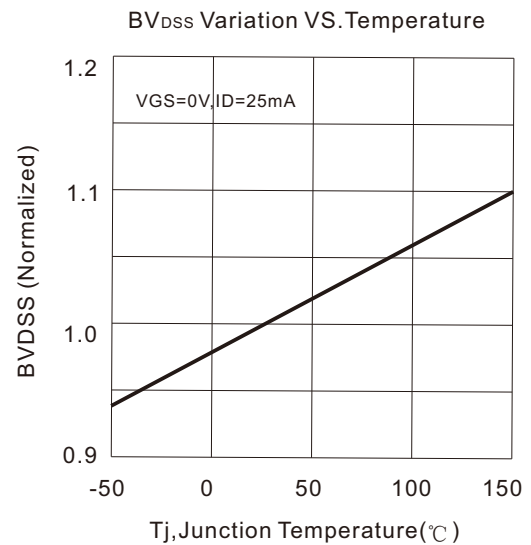
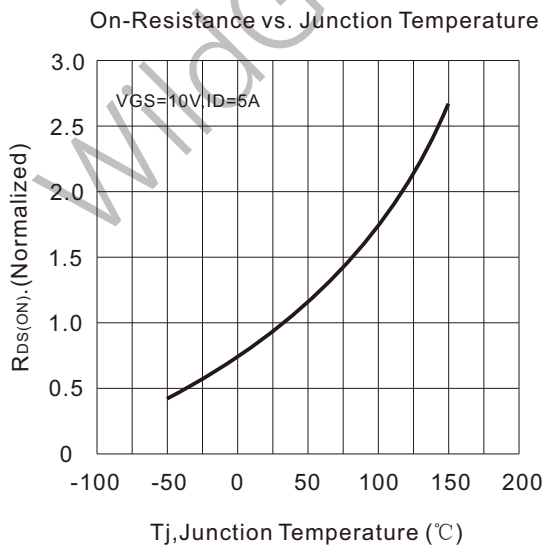
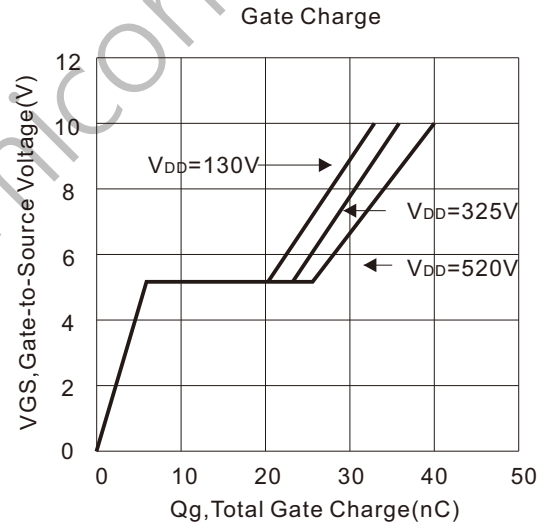
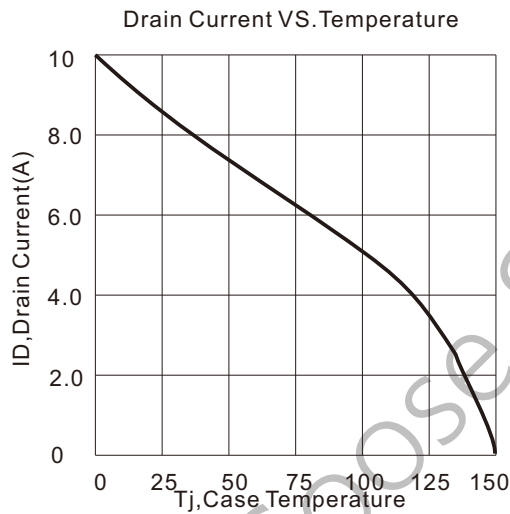
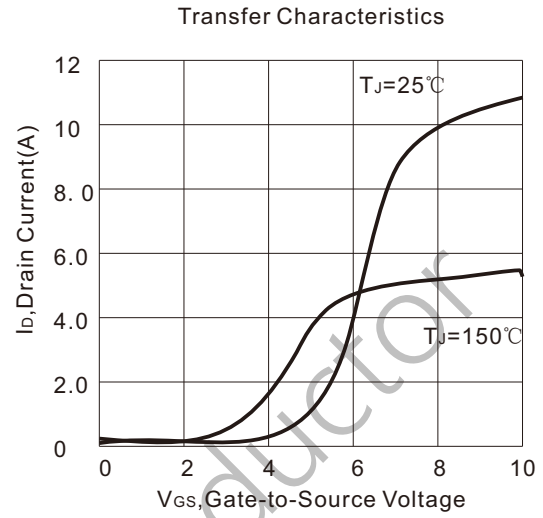
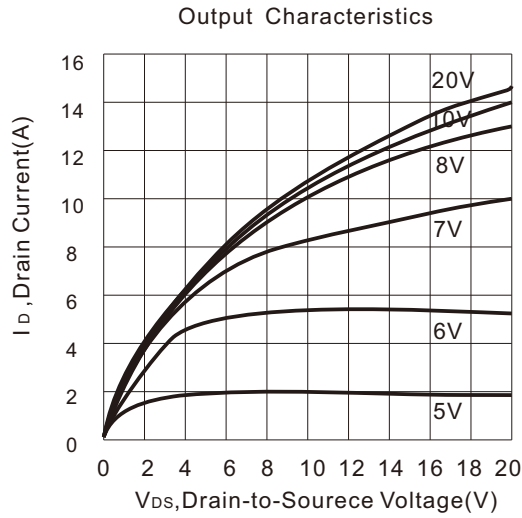
Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJC</sub>	Thermal Resistance,Junction to Case	-	2.4	°C/W
R <sub>θJA</sub>	Thermal Resistance,Junction to Ambient	-	62.5	°C/W

### Electrical Characteristics (Ta=25°C unless otherwise noted)

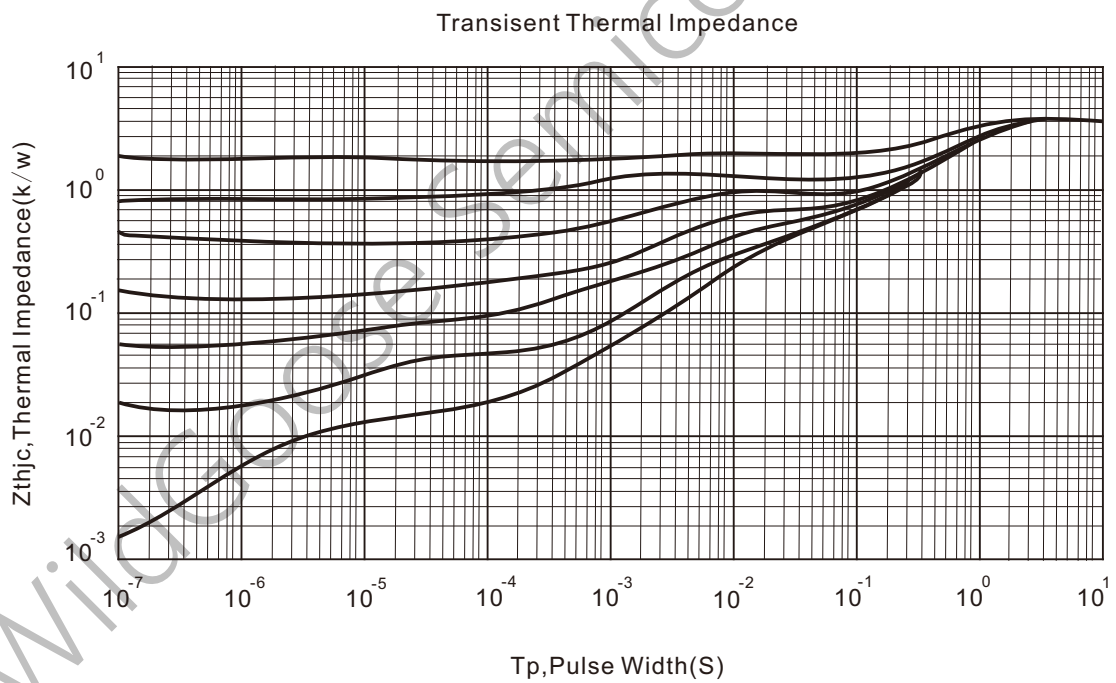
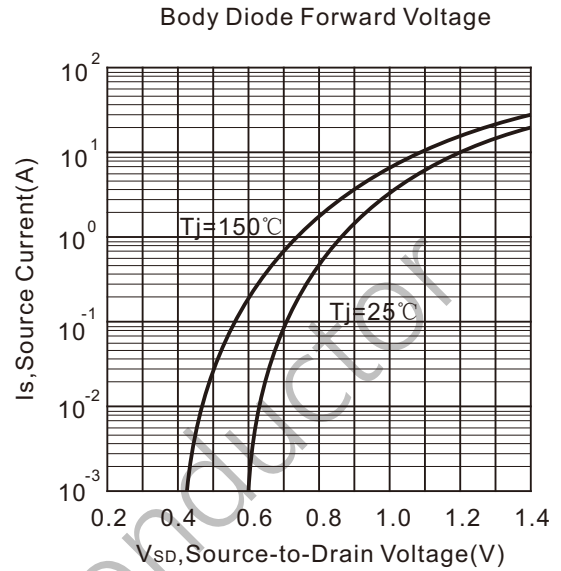
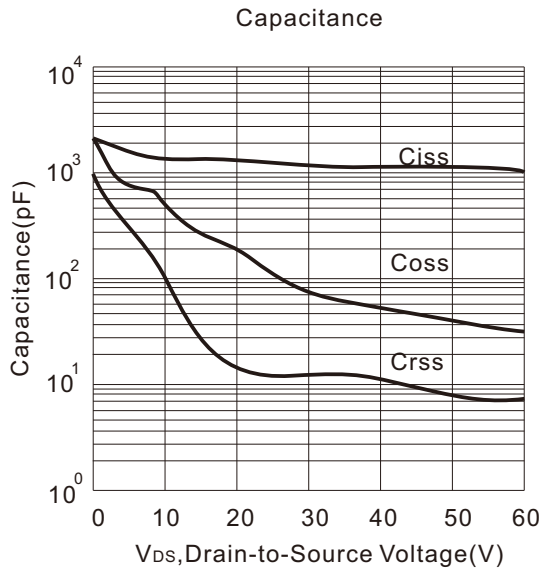
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$I_D=250\mu A, V_{GS}=0$	600	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D=250\mu A$ , Reference to 25°C	-	0.67	-	V/°C
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=600V, V_{GS}=0V$	-	-	10	$\mu A$
		$V_{DS}=480V, T_J=125^\circ C$	-	-	100	
$I_{GSSF}$	Gate-body leakage Current, Forward	$V_{GS}=+30V, V_{DS}=0V$	-	-	100	nA
$I_{GSSR}$	Gate-body leakage Current, Reverse	$V_{GS}=-30V, V_{DS}=0V$	-	-	-100	
<b>On Characteristics</b>						
$V_{GS(TH)}$	Gate Threshold Voltage	$I_D=250\mu A, V_{DS}=V_{GS}$	2	-	4	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$I_D=5.0A, V_{GS}=10V$	-	0.75	0.8	$\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0, f=1.0MHz$	-	1500	-	pF
$C_{oss}$	Output Capacitance		-	194	-	
$C_{rss}$	Reverse Transfer Capacitance		-	18	-	
<b>Switching Characteristics</b>						
$T_d(on)$	Turn-On Delay Time	$V_{DD}=300V, I_D=10A, R_G=25\Omega$ (Note 3,4)	-	23	-	nS
$T_r$	Turn-On Rise Time		-	15	-	
$T_d(off)$	Turn-Off Delay Time		-	90	-	
$T_f$	Turn-Off Rise Time		-	30	-	
$Q_g$	Total Gate Charge	$V_{DS}=480V, V_{GS}=10V, I_D=10A$ (Note3,4)	-	35	-	nC
$Q_{gs}$	Gate-Source Charge		-	7	-	
$Q_{gd}$	Gate-Drain Charge		-	18	-	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Max. Diode Forward Current	-	-	-	10	A
$I_{SM}$	Max. Pulsed Forward Current	-	-	-	40	
$V_{SD}$	Diode Forward Voltage	$I_D=10A$	-	-	1.4	V
$T_{rr}$	Reverse Recovery Time	$I_S=10A, V_{GS}=0V, diF/dt=100A/\mu s$ (Note3)	-	320	-	nS
$Q_{rr}$	Reverse Recovery Charge		-	4.2	-	$\mu C$

- Notes : 1, L=0.5mH, IAS= 10A, VDD=50V, RG=25 $\Omega$ , Starting T<sub>J</sub> =25°C  
 2, Repetitive Rating : Pulse width limited by maximum junction temperature  
 3, Pulse Test : Pulse Width  $\leq$  300 $\mu s$ , Duty Cycle  $\leq$  2%  
 4, Essentially Independent of Operating Temperature

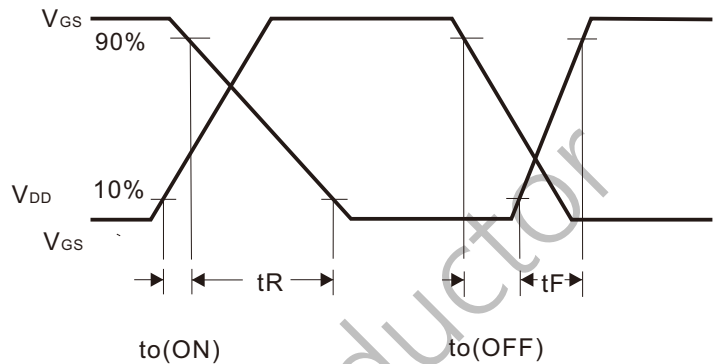
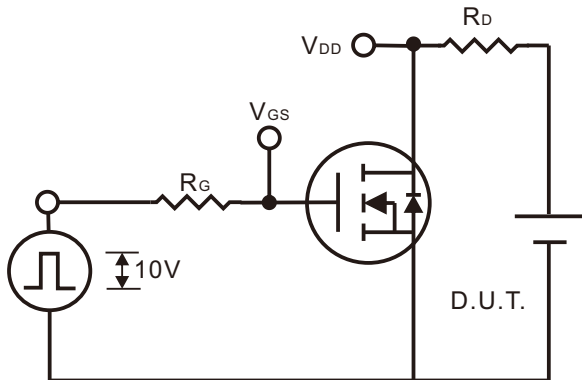
Typical Characteristics



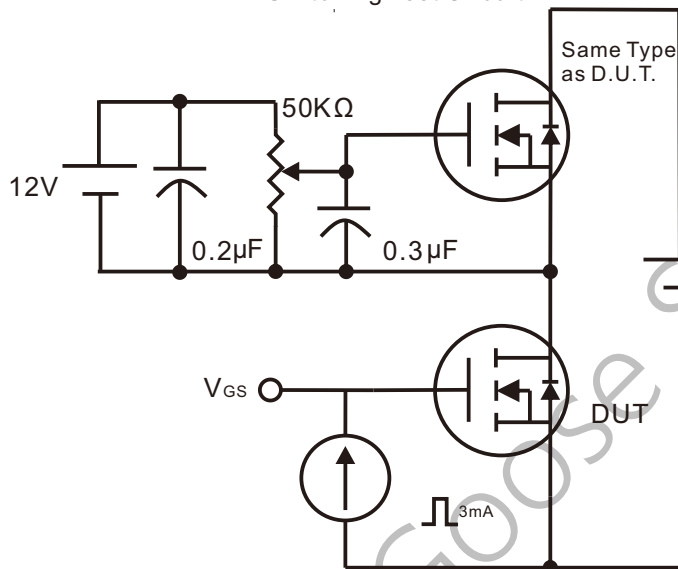
Typical Characteristics (Continued)



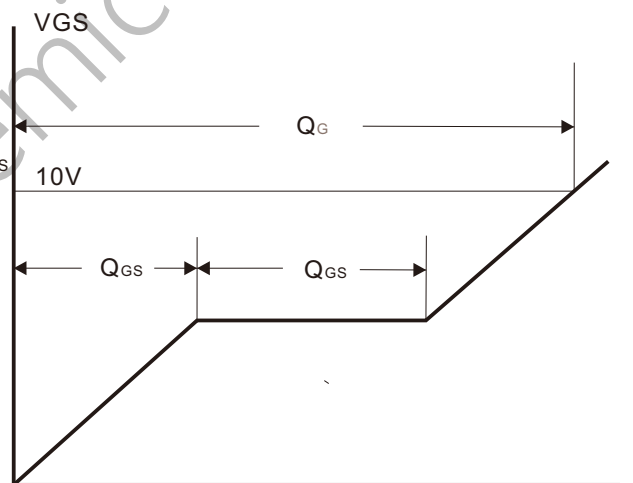
Gate Charge Test Circuit & Waveform



Switching Test Circuit

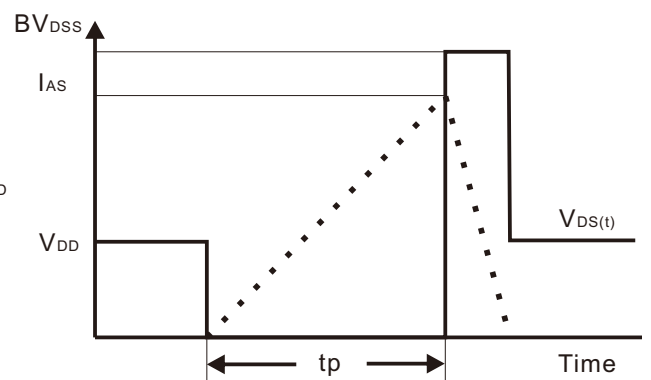
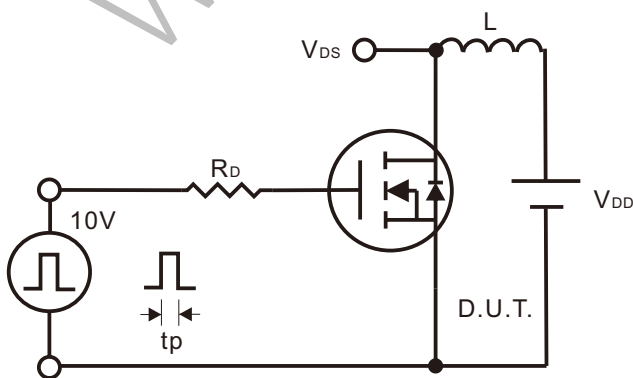


Switching Waveforms



Gate Charge Test Circuit

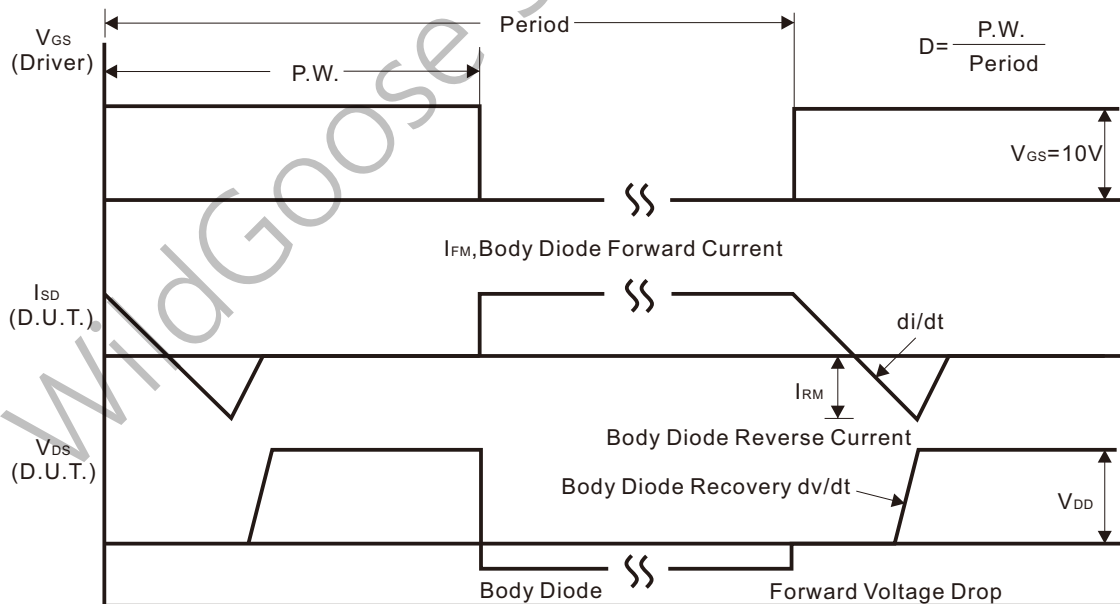
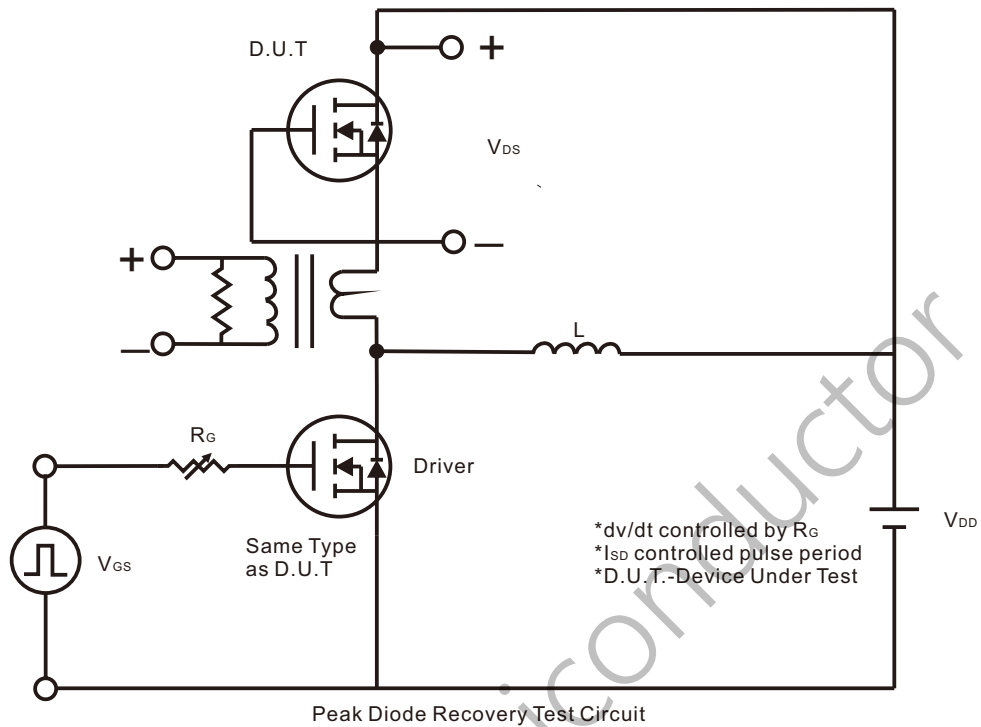
Gate Charge Waveform



Unclamped Inductive Switching Test Circuit

Unclamped Inductive Switching Waveforms

Peak Diode Recovery  $dv/dt$  Test Circuit & Waveform



Package Dimension

TO-220F

Unit: mm

