

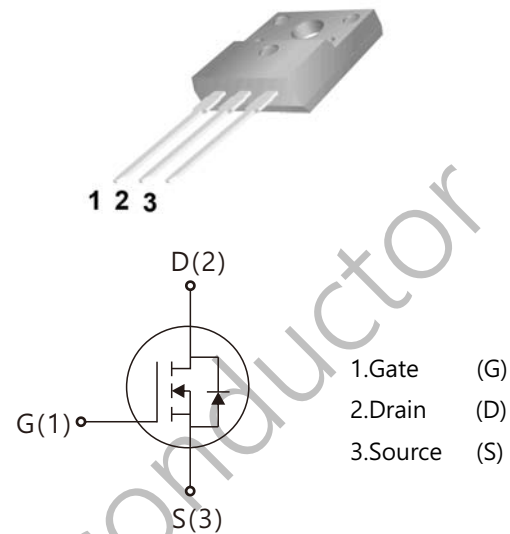


## WGF10N65SE

## Features:

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge : $Q_g=35\text{nC}$  (Typ.).
- $BV_{DSS}=650\text{V}$ ,  $I_D=10\text{A}$
- $R_{DS(on)} : 0.9\ \Omega$  (Max) @  $V_G=10\text{V}$
- 100% Avalanche Tested

TO-220F



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

Symbol	Parameter	Value	Unit
$V_{DSS}$	Drain-Source Voltage	650	V
$I_D$	Drain Current	$T_j=25^\circ\text{C}$	10
		$T_j=100^\circ\text{C}$	6.7
$V_{GSS}$	Gate Threshold Voltage	30	V
$E_{AS}$	Single Pulse Avalanche Energy (note1)	380	mJ
$I_{AR}$	Avalanche Current (note2)	10	A
$P_D$	Power Dissipation ( $T_j=25^\circ\text{C}$ )	65	W
$T_j$	Junction Temperature(Max)	150	°C
$T_{stg}$	Storage Temperature	-55~+150	°C
TL	Maximum lead temperature for soldering purpose, 1/8' from case for 5 seconds	300	°C

## Thermal Characteristics

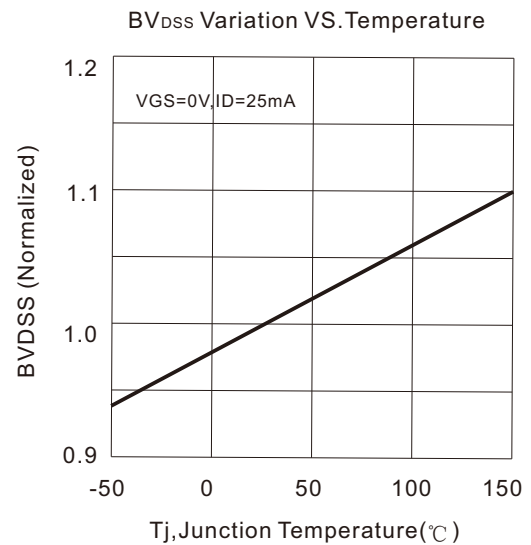
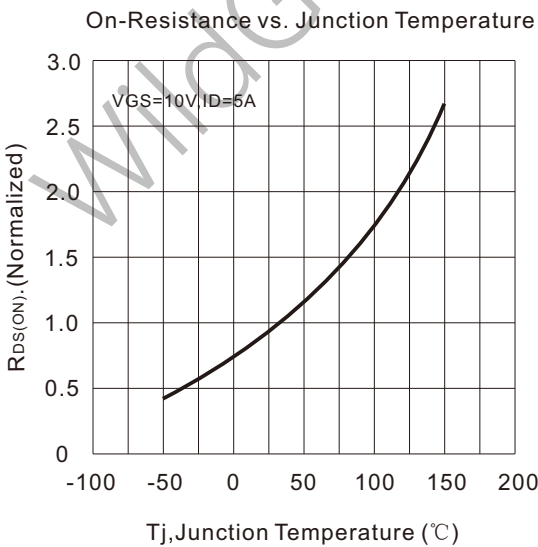
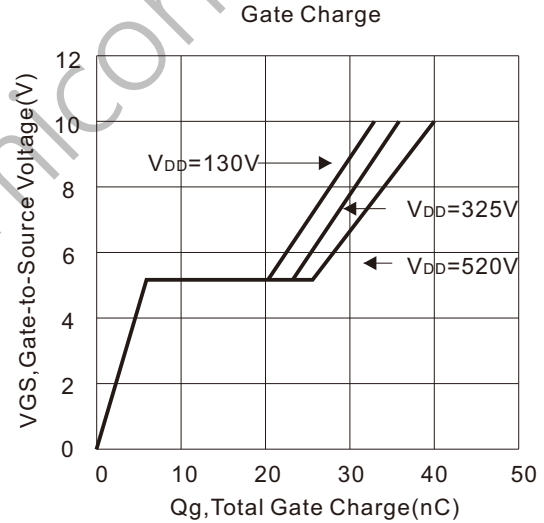
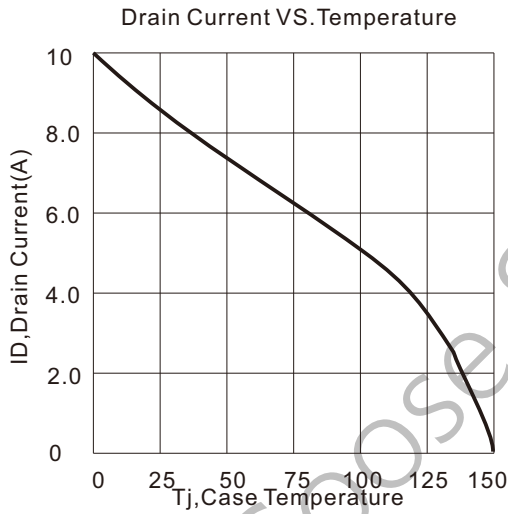
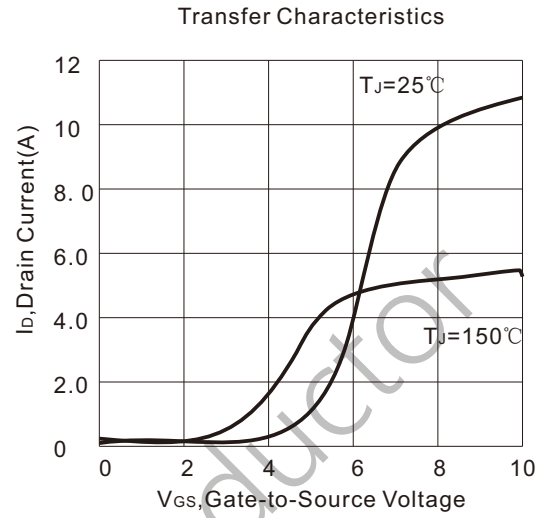
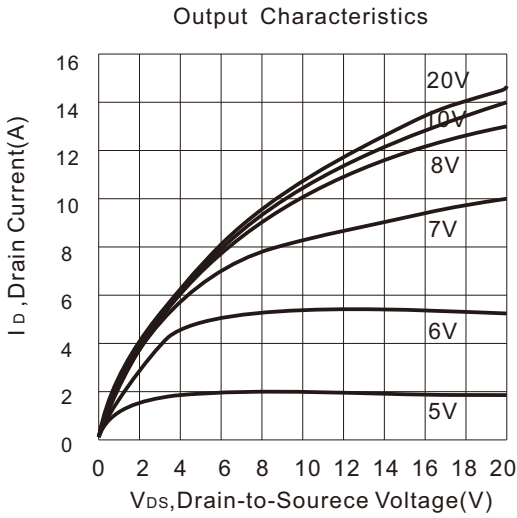
Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	-	2.4	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	-	62.5	°C/W

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

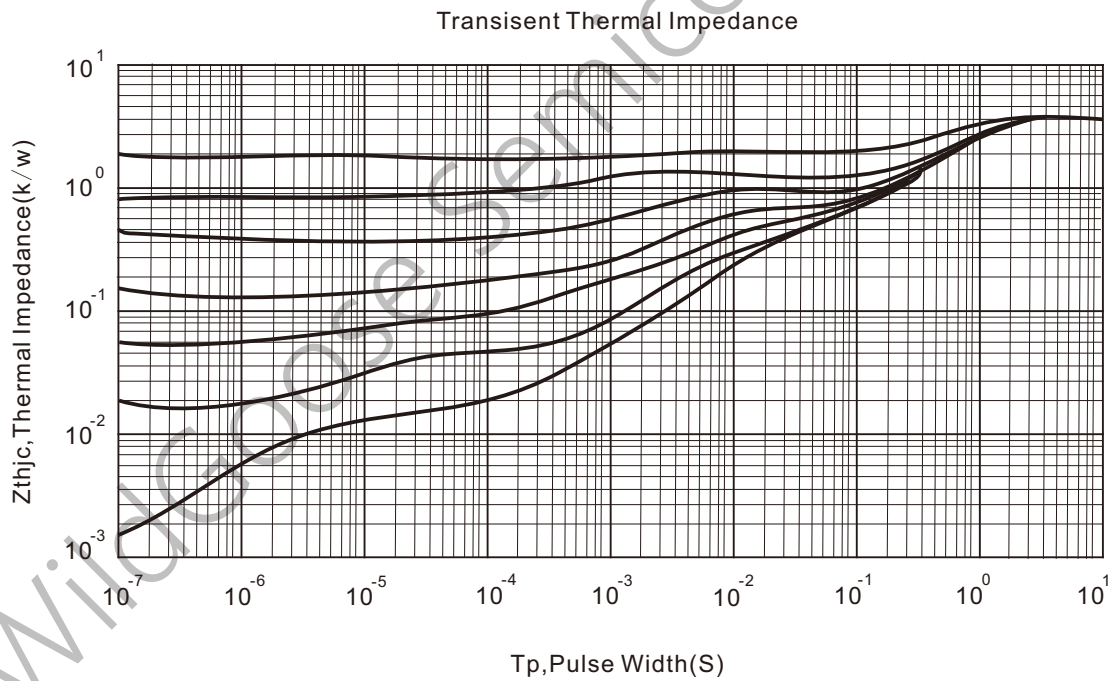
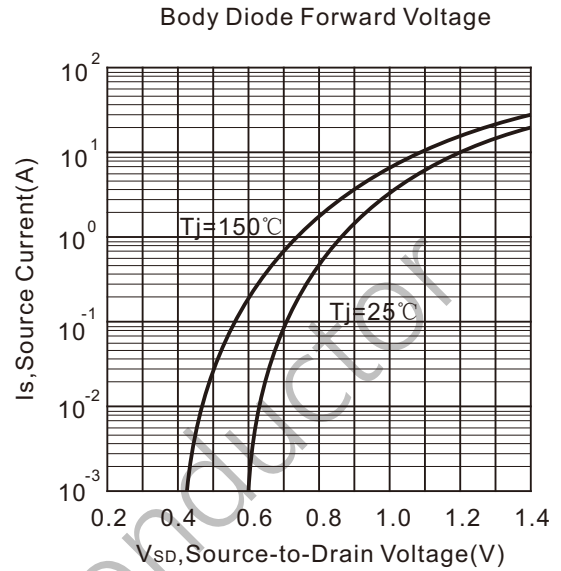
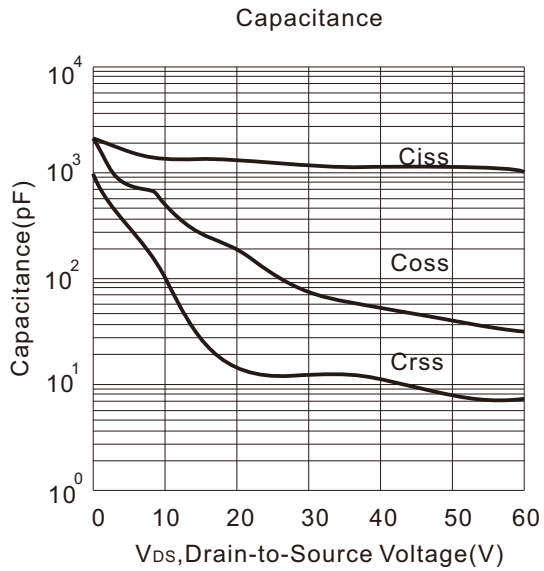
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$I_D=250\mu A, V_{GS}=0$	650	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D=250\mu A$ , Reference to 25°C	-	0.67	-	V/°C
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V$	-	-	10	$\mu A$
		$V_{DS}=520V, T_J=125^\circ C$			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	
On Characteristics						
$V_{GS(TH)}$	Gate Threshold Voltage	$I_D=250\mu A, V_{DS}=V_{GS}$	2	-	4	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$I_D=5.0A, V_{GS}=10V$	-	0.8	0.9	$\Omega$
Dynamic Characteristics						
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0, f=1.0MHz$	-	1500	-	$\mu F$
$C_{oss}$	Output Capacitance		-	194	-	
$C_{rss}$	Reverse Transfer Capacitance		-	18	-	
Switching Characteristics						
$T_d(on)$	Turn-On Delay Time	$V_{DD}=325V, I_D=10A, R_G=25\Omega$ (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	$V_{DS}=520V, V_{GS}=10V, I_D=10A$ (Note3,4)	-	35		nC
$Q_{gs}$	Gate-Source Charge			7	-	
$Q_{gd}$	Gate-Drain Charge			18	-	
Drain-Source Diode Characteristics and Maximum Ratings						
$I_S$	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	$I_S=10A, V_{GS}=0V, diF/dt=100A/\mu s$	-	320	-	nS
$Q_{rr}$	Reverse Recovery Charge	(Note3)	-	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

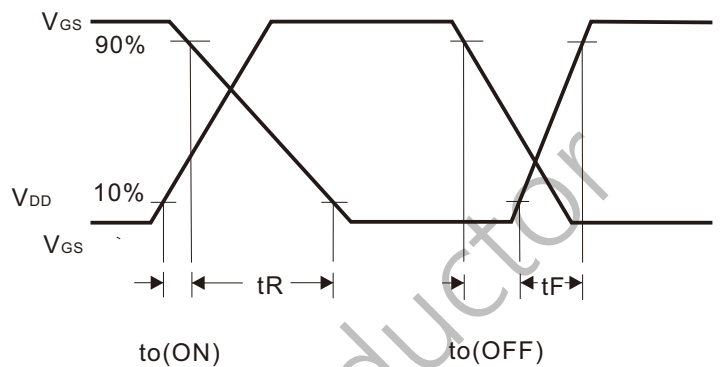
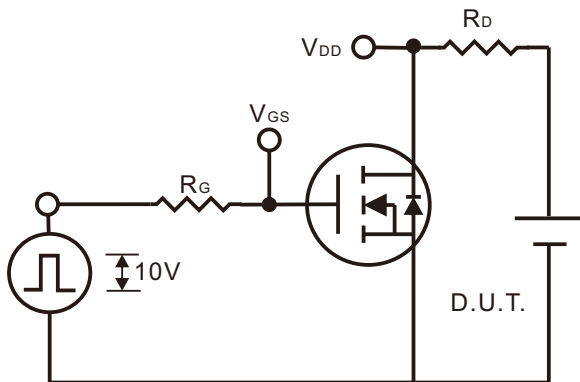
Typical Characteristics



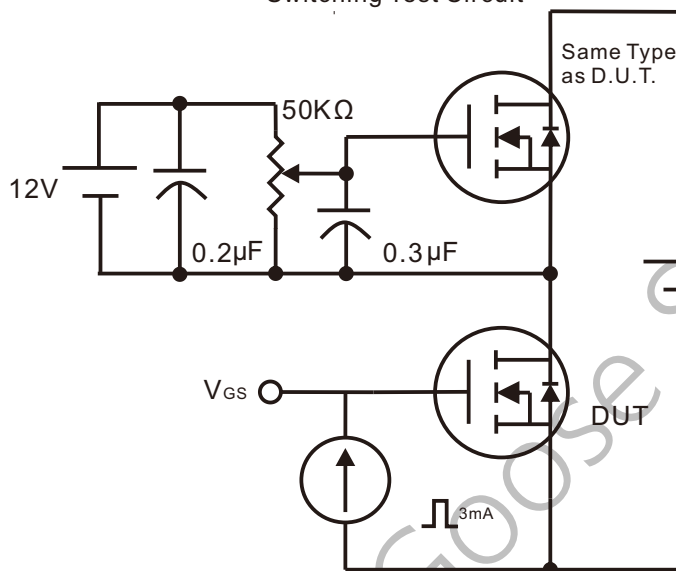
Typical Characteristics (Continued)



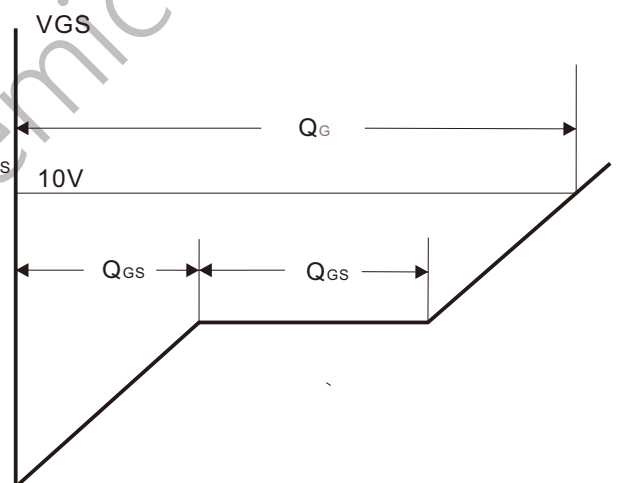
Gate Charge Test Circuit & Waveform



Switching Test Circuit

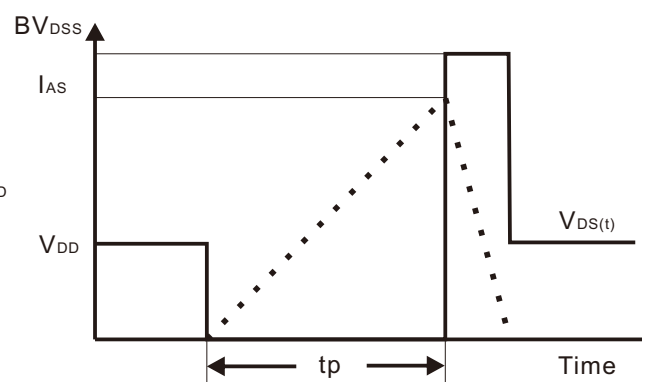
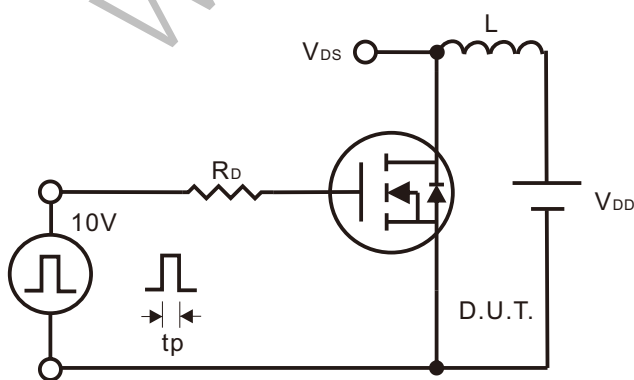


Switching Waveforms



Gate Charge Test Circuit

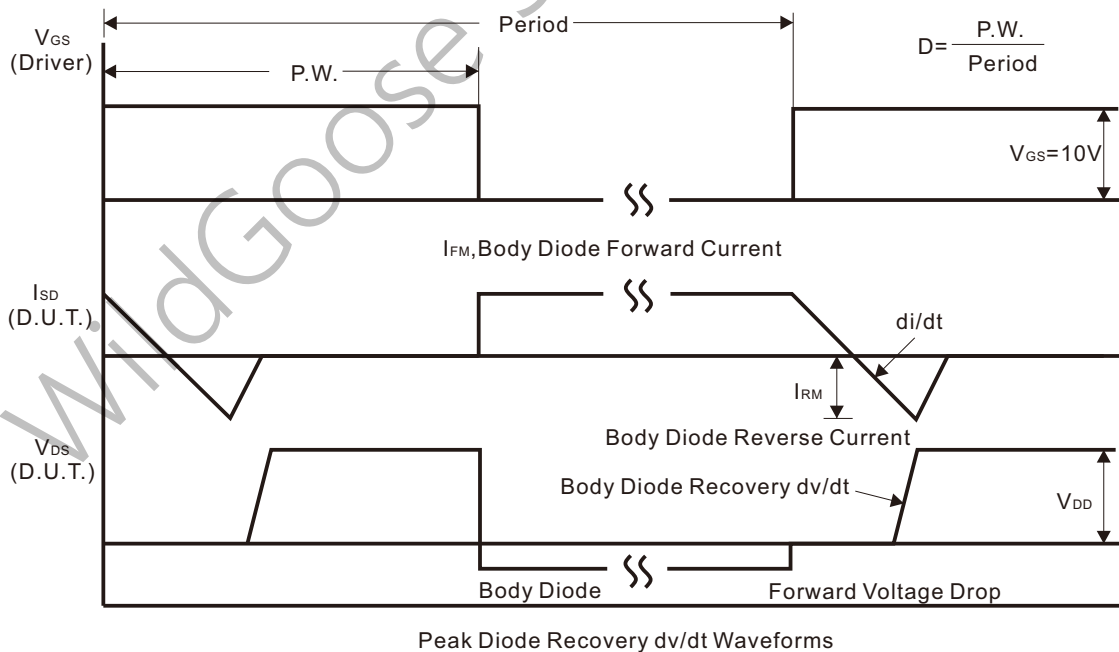
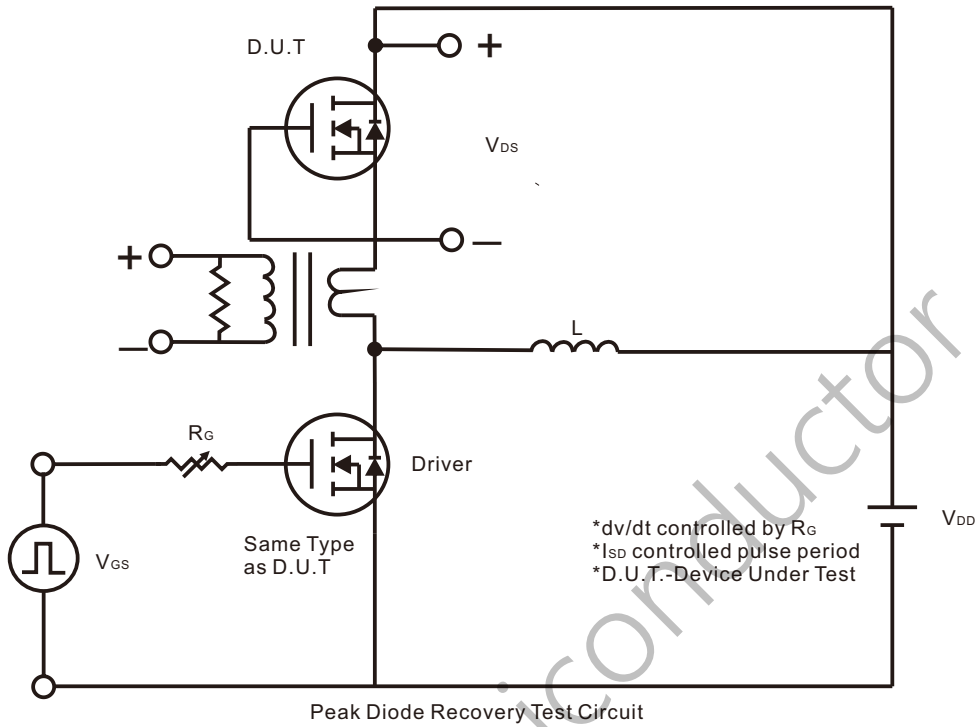
Gate Charge Waveform



Unclamped Inductive Switching Test Circuit

Unclamped Inductive Switching Waveforms

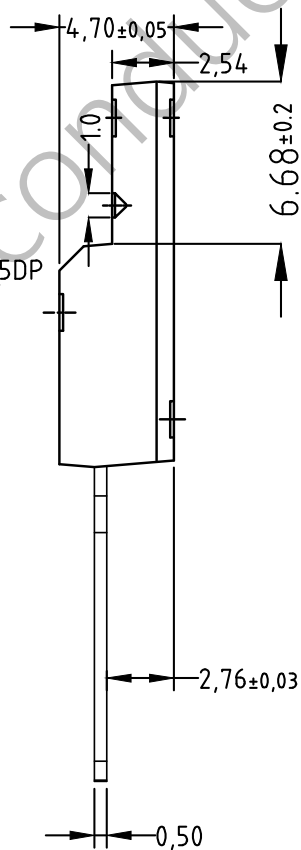
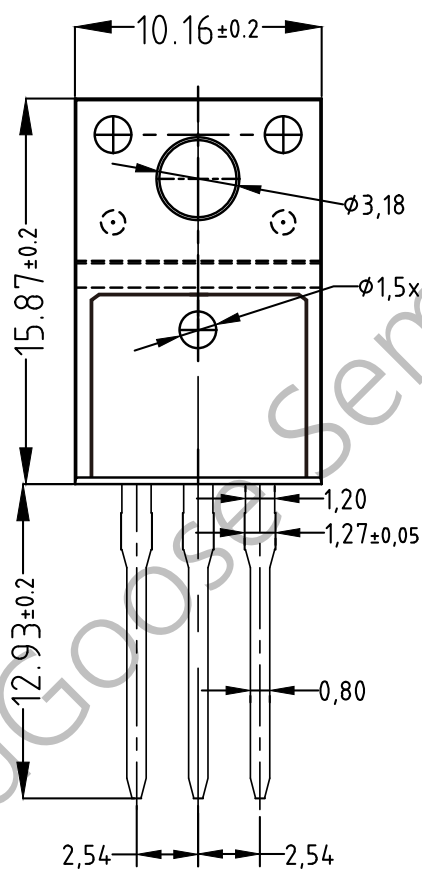
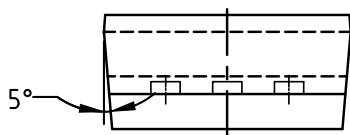
Peak Diode Recovery  $dv/dt$  Test Circuit & Waveform



Package Dimension

TO-220F

Unit: mm



WildGoose Semiconductor