

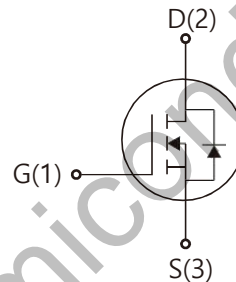
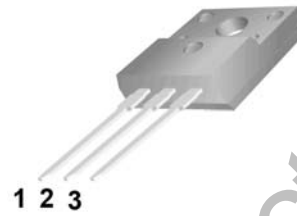


WGF65R125G

Features

- Super Junction technology
- Much lower $R_{on} \cdot A$ Performance for On-state efficiency
- Better efficiency due to very low FOM
- Ultra-fast body diode
- $V_{DSS}=650V$, $I_D=22A$
- $R_{DS(on)} : 95m\Omega$ (Typ) @ $V_G=10V$

TO-220F



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

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	650	V
Continuous drain current	I_D	22	A
$T_C = 25^\circ C$ $T_C = 100^\circ C$		13	
Pulsed drain current ($T_C = 25^\circ C$, t_p limited by T_{jmax})	$I_{D\ pulse}$	88	A
Avalanche energy, single pulse ($L=30mH$, $R_g=30\Omega$)	E_{AS}	300	mJ
Gate-Source voltage	V_{GS}	± 30	V
Power dissipation ($T_C = 25^\circ C$)	P_{tot}	23	W
Operating junction and storage temperature	T_j, T_{stg}	-55...+150	$^\circ C$

Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case. Max	RthJC	-	3.91	5.47	°C/W	
Thermal resistance, junction – ambient. Max	RthJA	-	-	67	°C/W	

Electrical Characteristic (at T_j = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV _{DSS}	650	-	-	V	V _{GS} =0V, I _D =250uA
Gate threshold voltage	V _{GS(th)}	3.4	-	4.6	V	V _{DS} =V _{GS} , I _D =250uA
Zero gate voltage drain current	I _{DSS}	-	-	5	μA	V _{DS} =600V, V _{GS} =0V T _C =25°C T _C =150°C
Gate-source leakage current	I _{GSS}	-	-	±100	nA	V _{GS} =±30V, V _{DS} =0V
Drain-source on-state resistance	R _{DS(on)}	-	95	125	mΩ	V _{GS} =10V, I _D =11A, T _C =25°C T _C =150°C
Transconductance	g _{fs}	-	15	-	S	V _{DS} =20V, I _D =11A
Dynamic Characteristic						
Input Capacitance	C _{iss}	-	1587	-	pF	V _{GS} =0V, V _{DS} =100V, f=1MHz
Output Capacitance	C _{oss}	-	95	-		
Reverse Transfer Capacitance	C _{rss}	-	39	-		
Gate Total Charge	Q _G	-	46.23	-	nC	V _{GS} =10V, V _{DS} =480V, I _D =11A
Gate-Source charge	Q _{gs}	-	13.8	-		
Gate-Drain charge	Q _{gd}	-	24.6	-		
Turn-on delay time	t _{d(on)}	-	57.2	-	ns	T _J =25°C, V _{GS} =10V, I _D =11A, V _{DS} =400V, R _g =25Ω
Rise time	t	-	59.2	-		
Turn-off delay time	t _{d(off)}	-	150.2	-		
Fall time	t _f	-	25	-		
Gate resistance	R _{gint}	-	10.0	-	Ω	f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	0.7	0.86	1.2	V	$V_{GS}=0V, I_{SD}=11A$
Body Diode Reverse Recovery Time	t_{rr}	-	116	-	ns	$I_{sd}=11A$ $dI/dt=100A/us$
Body Diode Reverse Recovery Charge	Q_{rr}	-	0.6	-	μC	$V_{ds}=400V$

Typical Performance Characteristics

Fig 1. Output Characteristics (Tj=25°C)

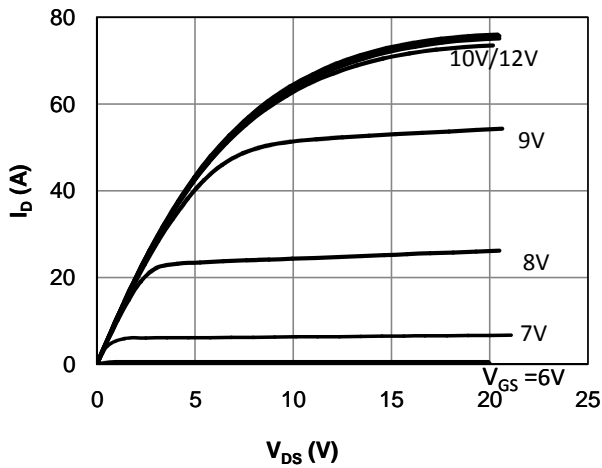


Fig 2. Output Characteristics (Tj=150°C)

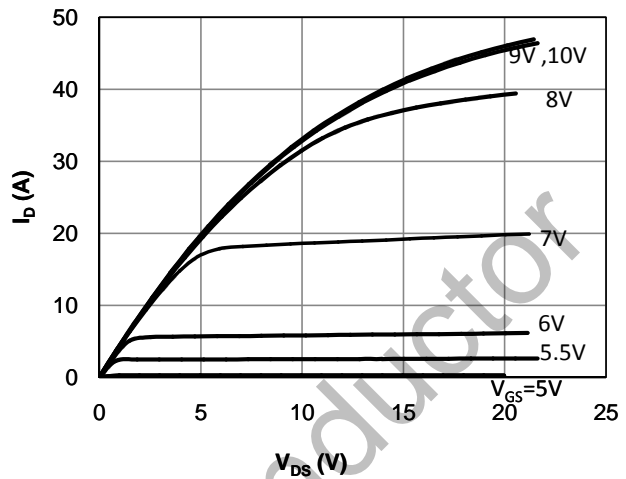


Fig 3: Transfer Characteristics

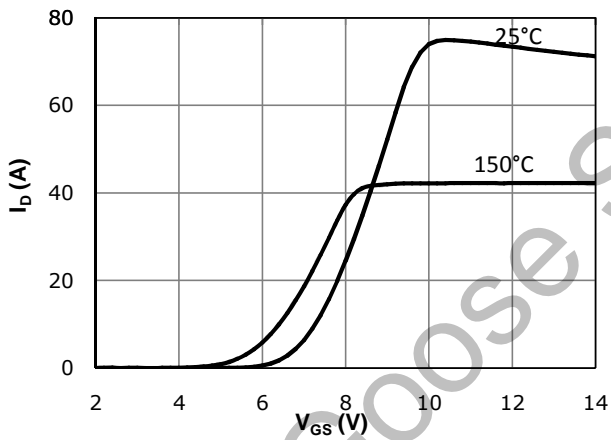


Fig 4: Vth Vs Tj Temperature Characteristics

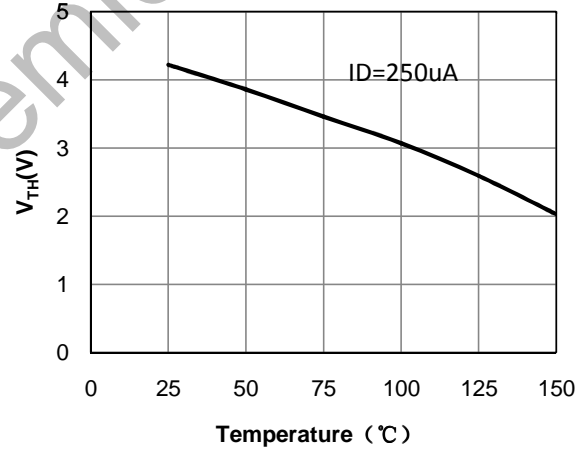


Fig 5: Rds(on) Vs Ids Characteristics (Tc=25°C)

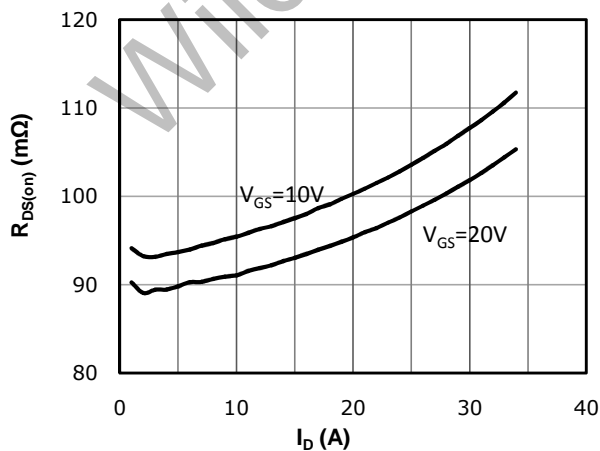


Fig 6: Rds(on) vs. Temperature

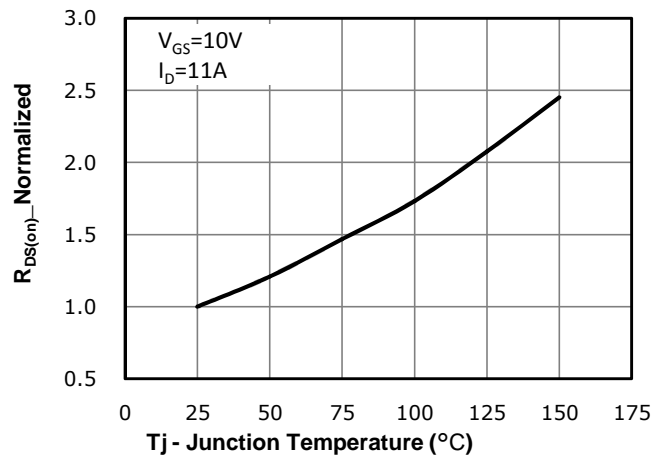


Fig 7: BVDSS vs. Temperature

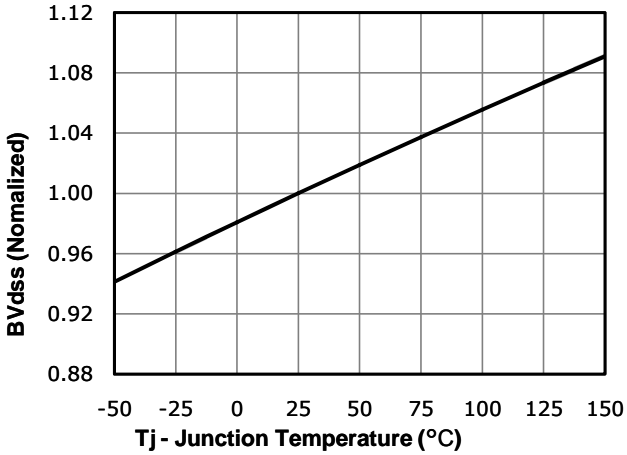


Fig 8: Rds(on) vs Gate Voltage

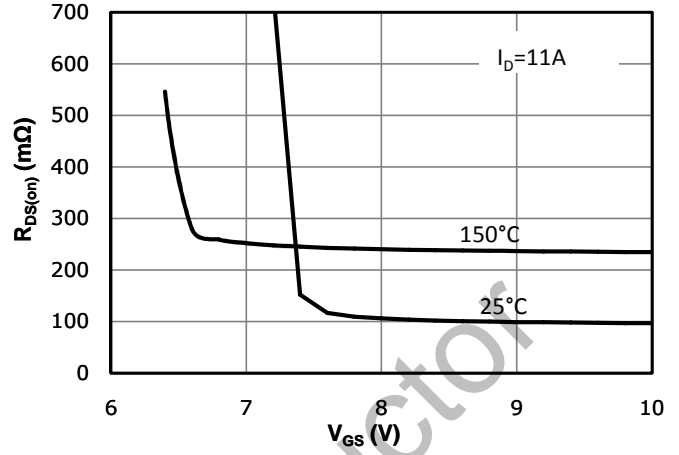


Fig 9: Body-diode Forward Characteristics

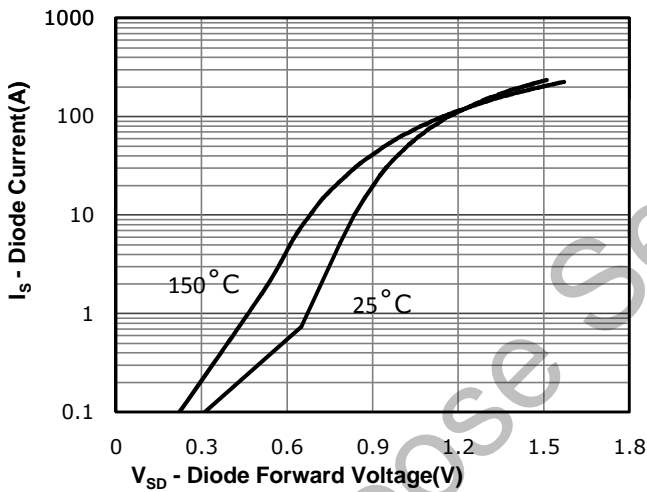


Fig 10: Gate Charge Characteristics

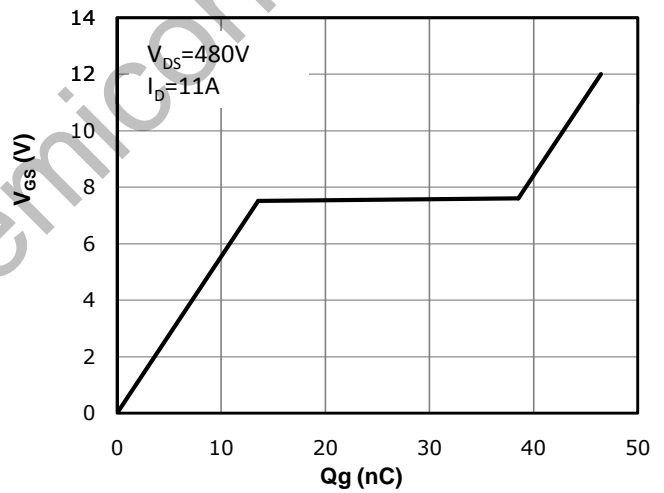


Fig 11: Capacitance Characteristics

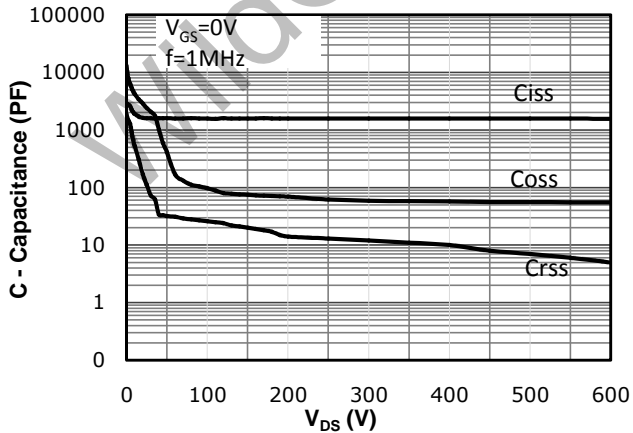


Fig 12: Safe Operating Area

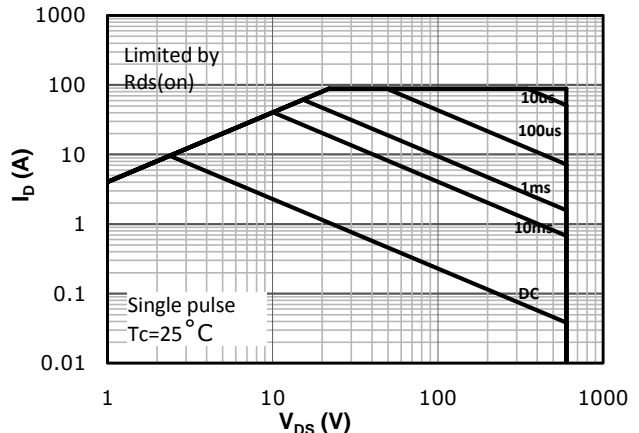
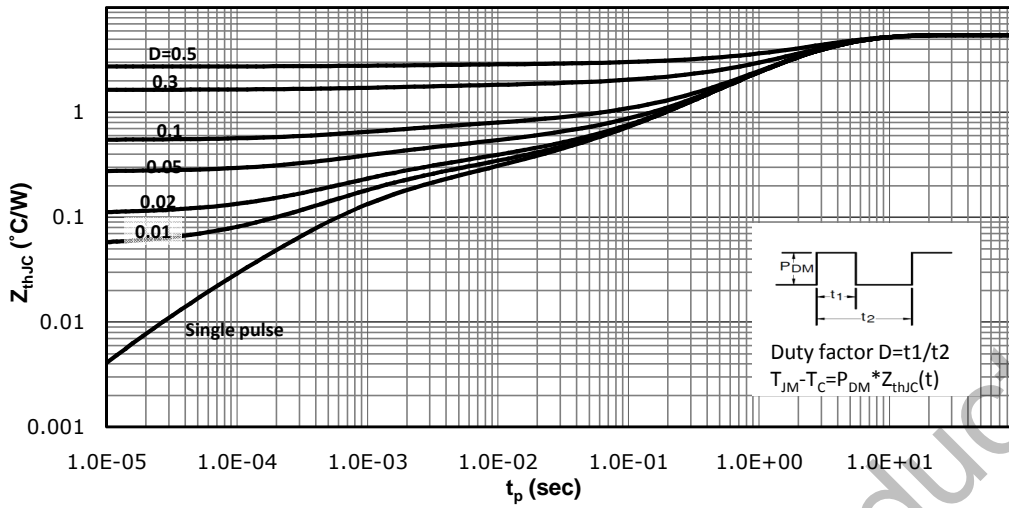
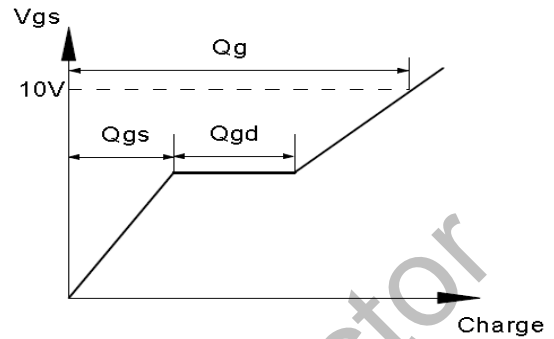
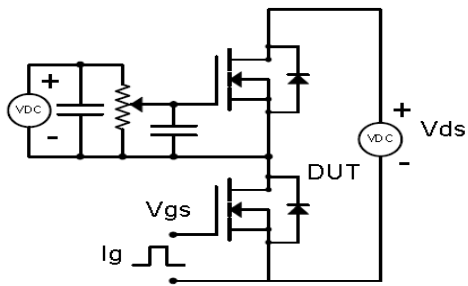


Fig 13: Max. Transient Thermal Impedance

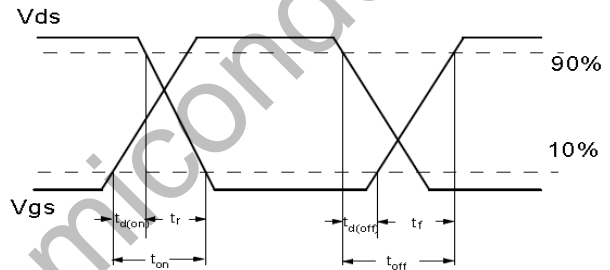
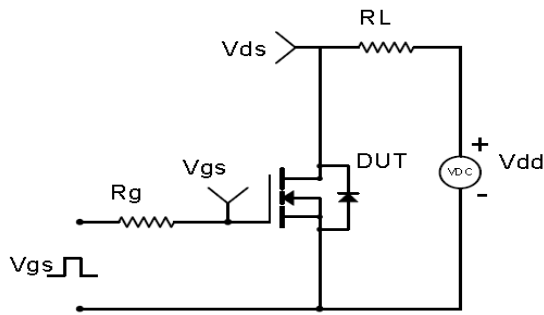


WildGoose Semiconductor

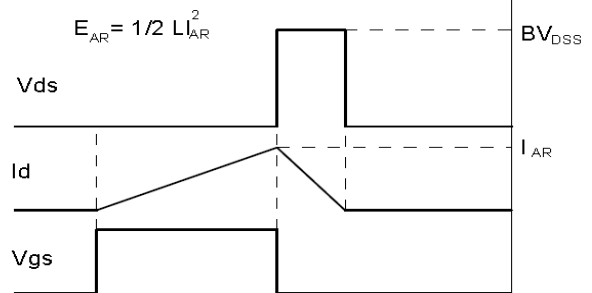
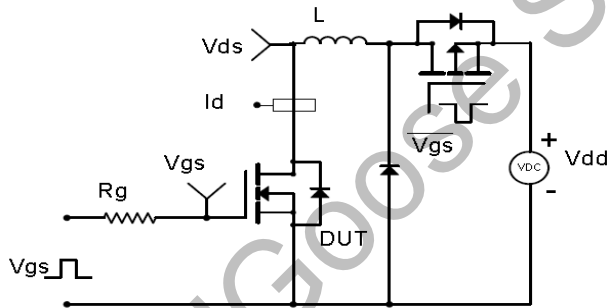
Gate Charge Test Circuit & Waveform



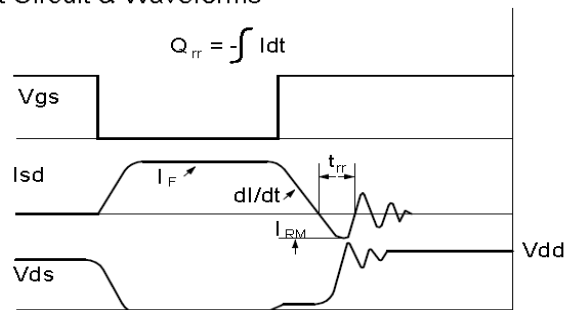
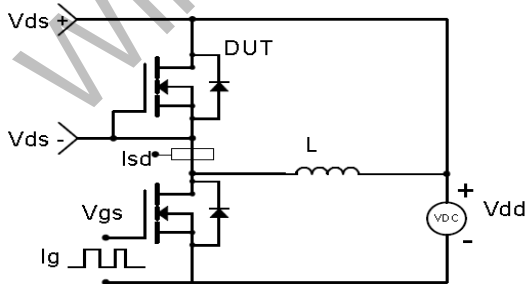
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



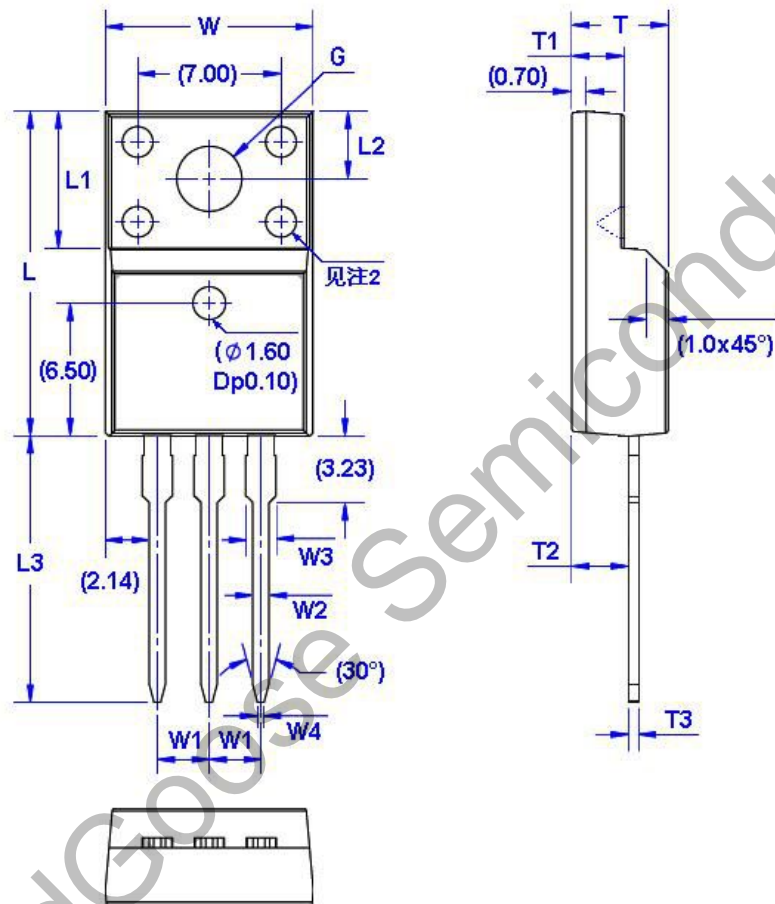
Diode Recovery Test Circuit & Waveforms



Package Dimension

TO-220F

Unit: mm



Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	9.96	10.36	W4	0.25	0.45	L3	12.78	13.18	T3	0.45	0.60
W1	2.54 (TYP)		L	15.67	16.07	T	4.50	4.90	G(Φ)	3.08	3.28
W2	0.70	0.90	L1	6.48	6.88	T1	2.34	2.74			
W3	1.24	1.47	L2	3.20	3.40	T2	2.56	2.96			