
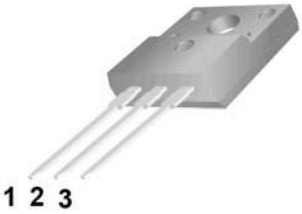
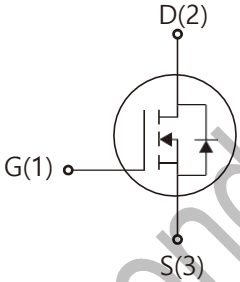


## WGF60R160L

**Features:**

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge :Q<sub>g</sub>=49nC(Typ.).
- V<sub>DSS</sub>=600 V, I<sub>D</sub>=20 A
- R<sub>DS(on)</sub> : 0.19 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	20
		T <sub>j</sub> =100°C	12
V <sub>GSS</sub>	Gate-Source Voltage	±30	V
E <sub>AS</sub>	Single Pulse Avalanche Energy (note1)	1062	mJ
I <sub>DM</sub>	Pulsed Drain Current (note2)	20	A
P <sub>D</sub>	Power Dissipation (T <sub>j</sub> =25°C )	47	W
T <sub>j</sub>	Junction Temperature(Max)	150	°C
T <sub>stg</sub>	Storage Temperature	-55~+150	°C
dv/dt	MOSFET dv/dt ruggeness,VDS=0V...480V	50	V/nS

**Thermal Characteristics**

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJC</sub>	Thermal Resistance Junction to Case	-	2.66	°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
Off Characteristics						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =250μA, V <sub>GS</sub> =0	600	-	-	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Breakdown Voltage Temperature Coefficient	I <sub>D</sub> =250μA, Reference to 25°C	-	0.59	-	V/°C
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =600V, V <sub>GS</sub> =0V	-	-	10	μA
		V <sub>DS</sub> =480V, T <sub>j</sub> =125°C	-	-	100	
I <sub>GSSF</sub>	Gate-body leakage Current, Forward	V <sub>GS</sub> =+30V, V <sub>DS</sub> =0V	-	-	100	nA
I <sub>GSSR</sub>	Gate-body leakage Current, Reverse	V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V	-	-	-100	
On Characteristics						
V <sub>GS(TH)</sub>	Gate Threshold Voltage	I <sub>D</sub> =250μA, V <sub>DS</sub> =V <sub>GS</sub>	2	-	4	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	I <sub>D</sub> =10A, V <sub>GS</sub> =10V	-	0.16	0.19	Ω
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =100V, V <sub>GS</sub> =0, f=1.0MHz	-	1480	-	pF
C <sub>oss</sub>	Output Capacitance		-	84	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	4.8	-	
Switching Characteristics						
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =300V, I <sub>D</sub> =20A R <sub>G</sub> =25Ω (Note 3,4)	-	21	-	nS
T <sub>r</sub>	Turn-on Rise Time		-	74	-	
T <sub>d(off)</sub>	Turn-Off Delay Time		-	213	-	
T <sub>f</sub>	Turn-Off Rise Time		-	65	-	
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =480V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A (Note3,4)	-	49	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	12	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	25	-	
Drain-Source Diode Characteristics and Maximum Ratings						
I <sub>S</sub>	Max. Diode Forward Current	-	-	-	20	A
I <sub>SM</sub>	Max. Pulsed Forward Current	-	-	-	80	
V <sub>SD</sub>	Diode Forward Voltage	I <sub>D</sub> =20A	-	-	1.4	V
T <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =20A, V <sub>GS</sub> =0V diF/dt=100A/μs (Note3)	-	442	-	nS
Q <sub>rr</sub>	Reverse Recovery Charge		-	7.0	-	μC

## Note

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) Pd is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of R<sub>θJA</sub> is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T<sub>a</sub>=25 °C.
- 5) V<sub>DD</sub>=100 V, V<sub>GS</sub>=10 V, L=79.9 mH, starting T<sub>j</sub>=25 °C.

典型特性曲线

图1. 输出特性

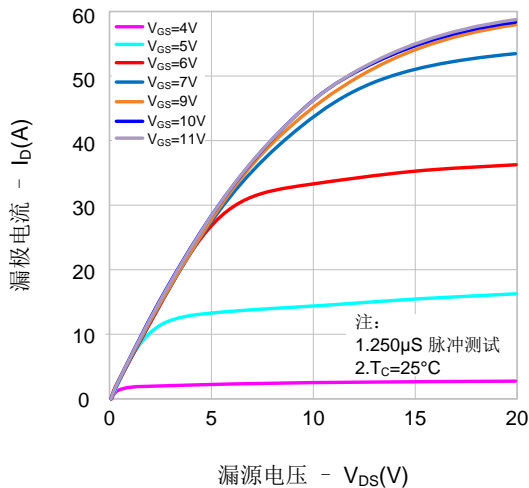


图2. 传输特性

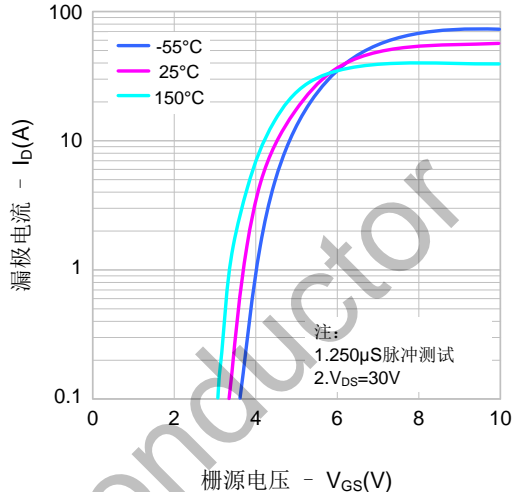


图3. 导通电阻vs.漏极电流

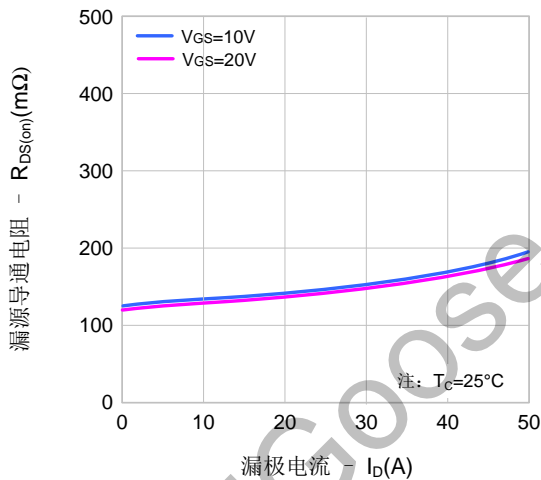


图4. 体二极管正向压降vs. 源极电流、温度

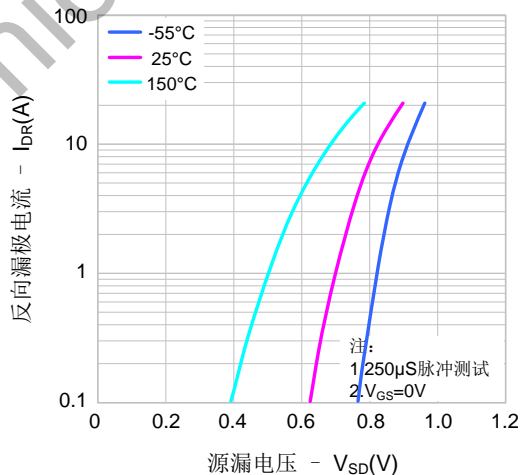


图5. 电容特性

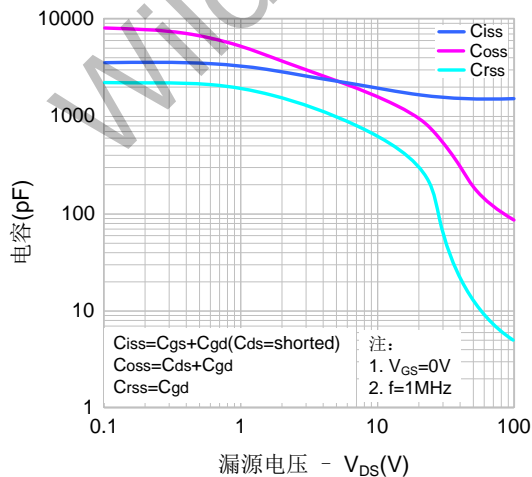
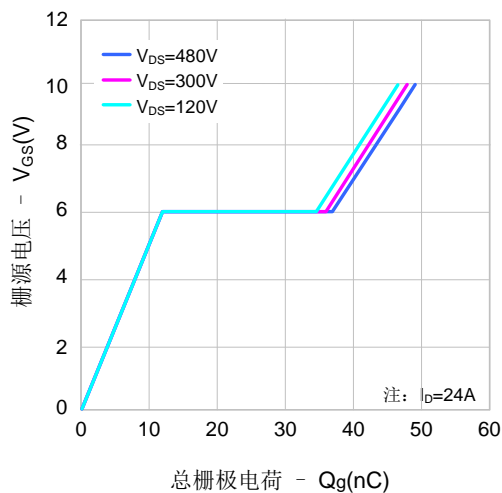


图6. 电荷量特性



典型特性曲线 (续)

图7. 击穿电压vs.温度特性

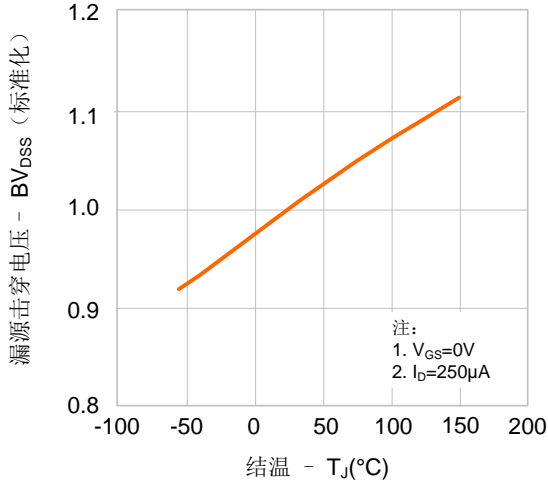


图8. 导通电阻vs.温度特性

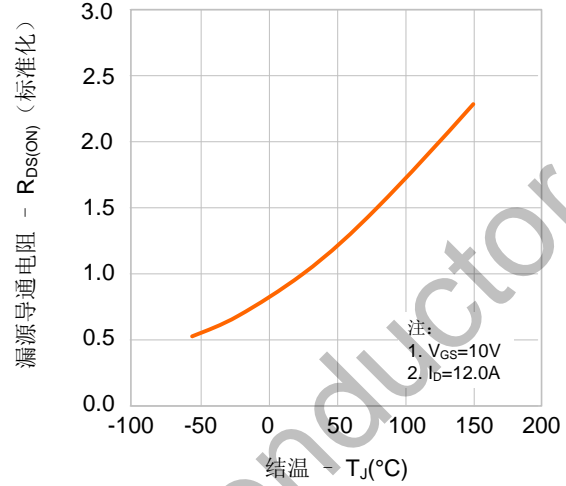
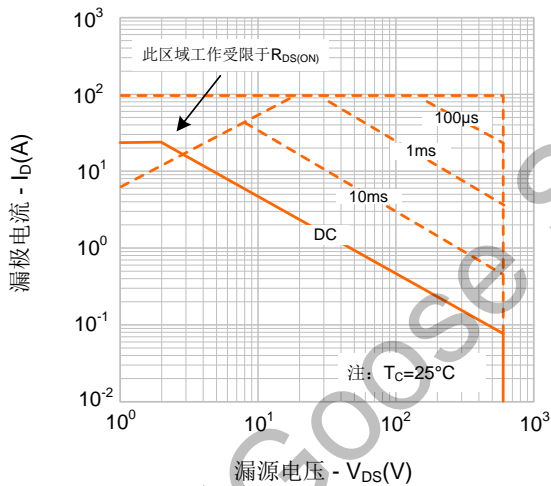
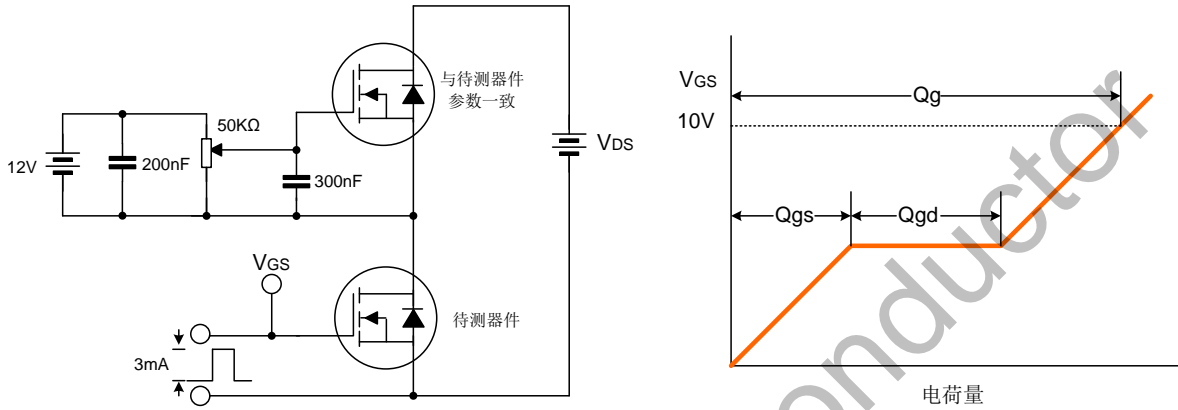


图9-1. 最大安全工作区域

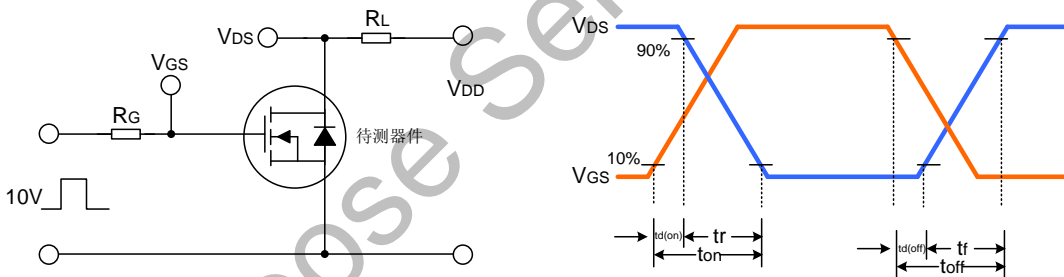


典型测试电路

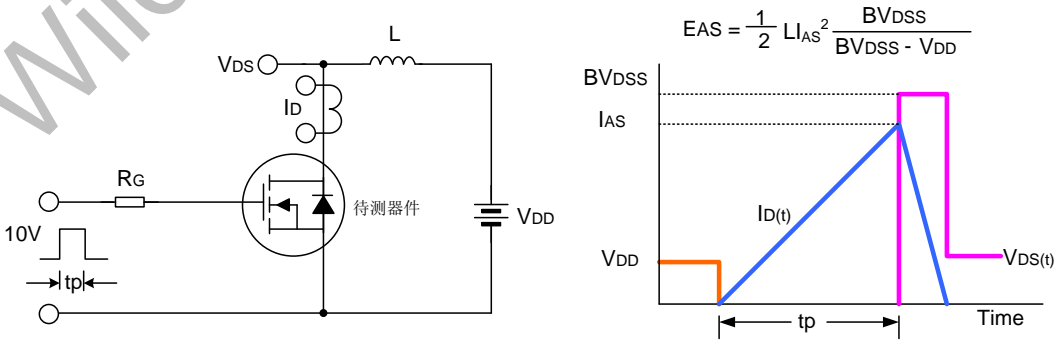
栅极电荷量测试电路及波形图



开关时间测试电路及波形图



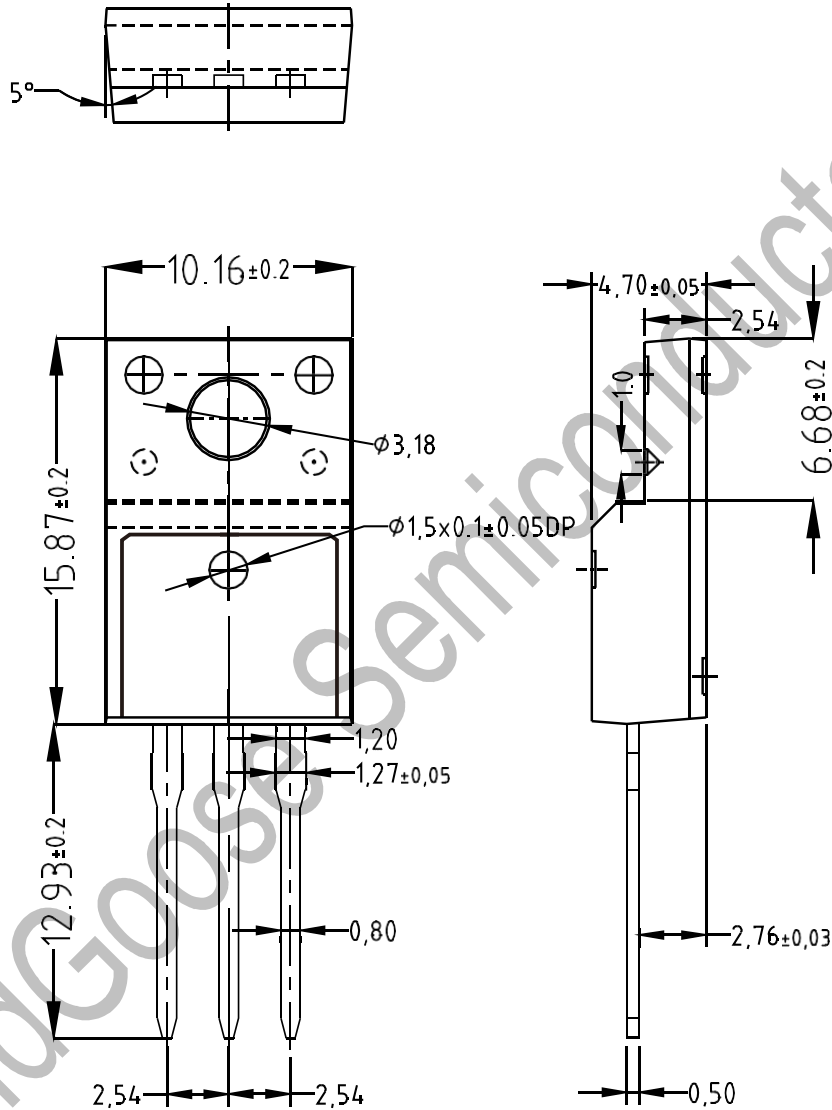
EAS测试电路及波形图



Package Dimension

TO-220F

Unit: mm



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