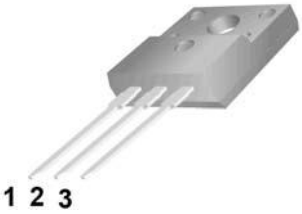
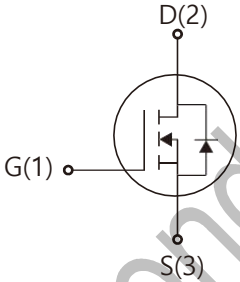


**WGF60R140L**


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>=24 A
- R<sub>DS(on)</sub> : 0.16 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	24
		T <sub>j</sub> =100°C	15
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)	24	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						
$BV_{DSS}$	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	-	0.59	-	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	
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	$I_D=12A, V_{GS}=10V$	-	0.14	0.16	$\Omega$
Dynamic Characteristics						
$C_{iss}$	Input Capacitance	$V_{DS}=100V, V_{GS}=0, f=1.0MHz$	-	1480	-	$\mu F$
$C_{oss}$	Output Capacitance		-	84	-	
$C_{rss}$	Reverse Transfer Capacitance		-	4.8	-	
Switching Characteristics						
$T_d(on)$	Turn-On Delay Time	$V_{DD}=300V, I_D=24A, R_G=25\Omega$ (Note 3,4)	-	21	-	nS
$T_r$	Turn-on Rise Time		-	74	-	
$T_d(off)$	Turn-Off Delay Time		-	213	-	
$T_f$	Turn-Off Rise Time		-	65	-	
$Q_g$	Total Gate Charge	$V_{DS}=480V, V_{GS}=10V, I_D=20A$ (Note3,4)	-	49	-	nC
$Q_{gs}$	Gate-Source Charge		-	12	-	
$Q_{gd}$	Gate-Drain Charge		-	25	-	
Drain-Source Diode Characteristics and Maximum Ratings						
$I_S$	Max. Diode Forward Current	-	-	-	24	A
$I_{SM}$	Max. Pulsed Forward Current	-	-	-	96	
$V_{SD}$	Diode Forward Voltage	$I_D=24A$	-	-	1.4	V
$T_{rr}$	Reverse Recovery Time	$I_S=24A, V_{GS}=0V, diF/dt=100A/\mu s$ (Note3)	-	442	-	nS
$Q_{rr}$	Reverse Recovery Charge		-	7.0	-	$\mu C$

## 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  $R_{\theta JA}$  is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_a=25^\circ C$ .
- 5)  $V_{DD}=100V, V_{GS}=10V, L=79.9mH$ , starting  $T_J=25^\circ C$ .

典型特性曲线

图1. 输出特性

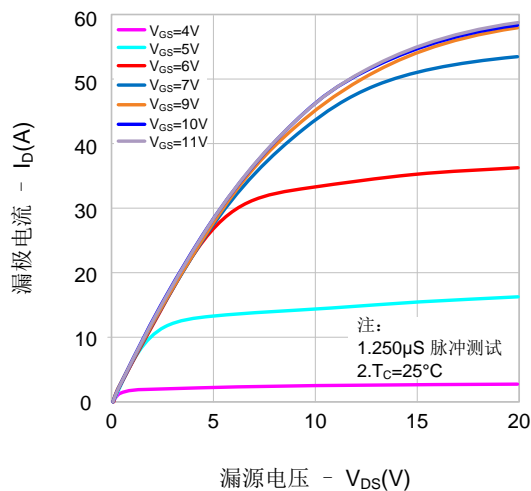


图2. 传输特性

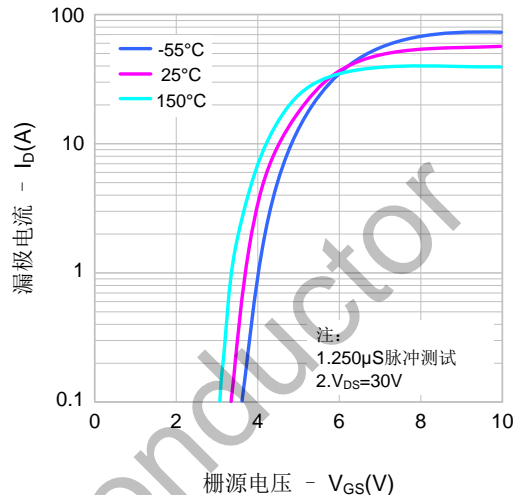


图3. 导通电阻vs.漏极电流

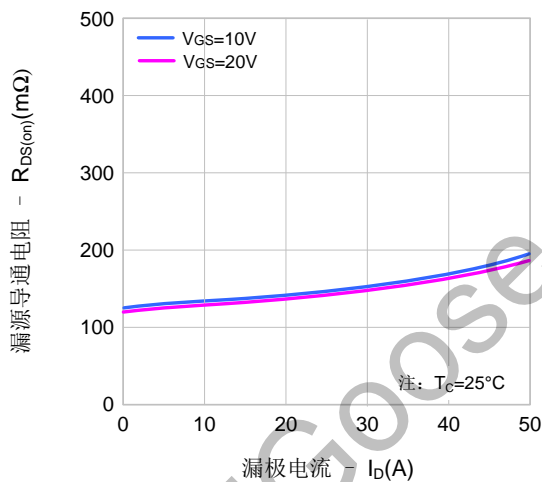


图4. 体二极管正向压降vs. 源极电流、温度

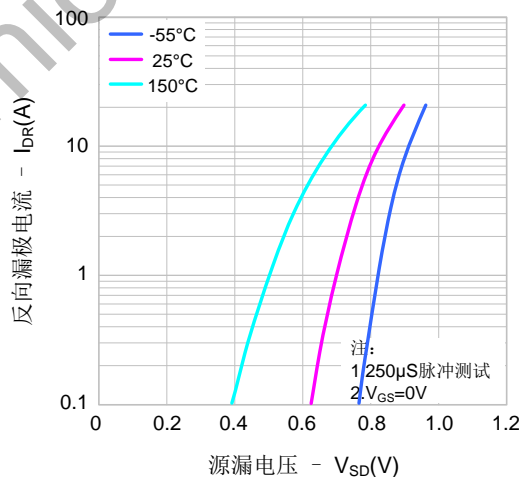


图5. 电容特性

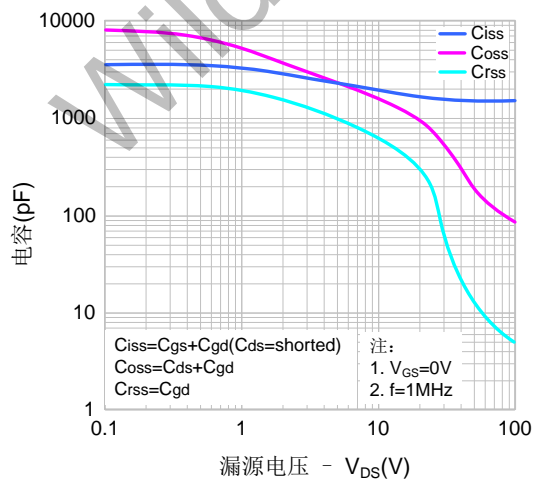
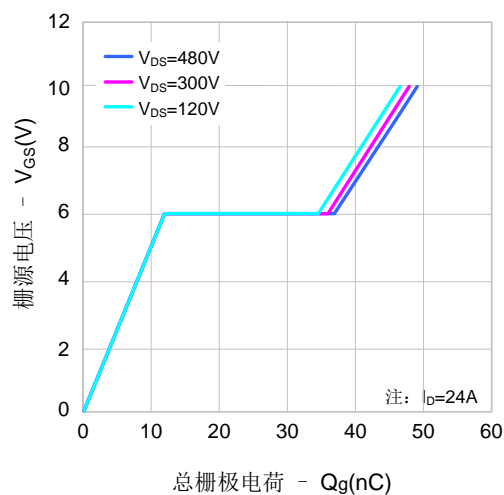


图6. 电荷量特性



典型特性曲线 (续)

图7. 击穿电压vs.温度特性

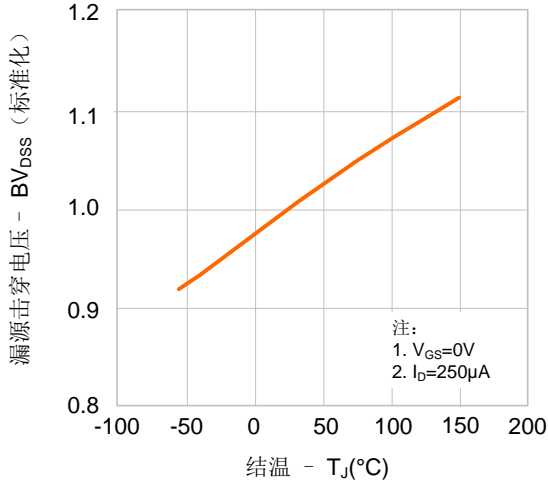


图8. 导通电阻vs.温度特性

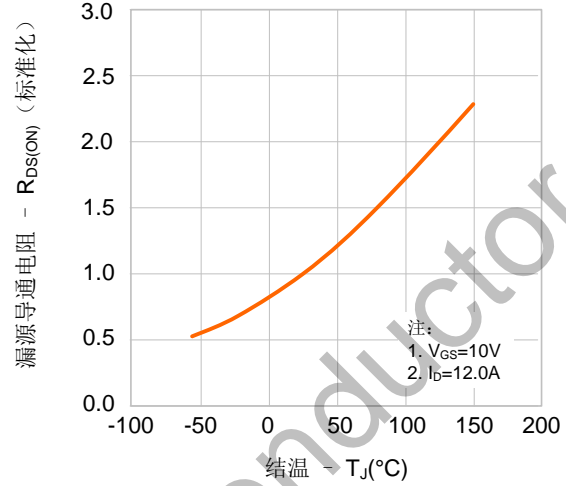
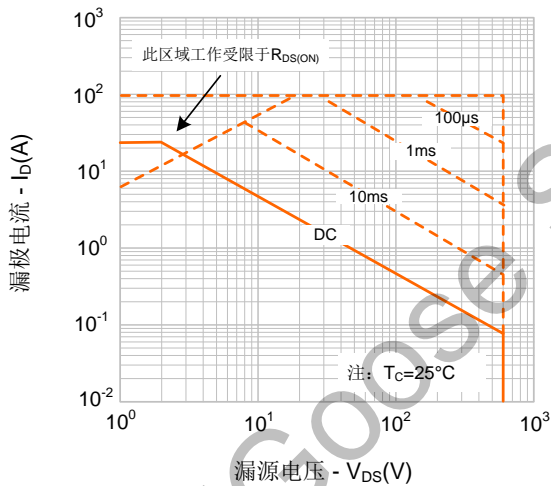
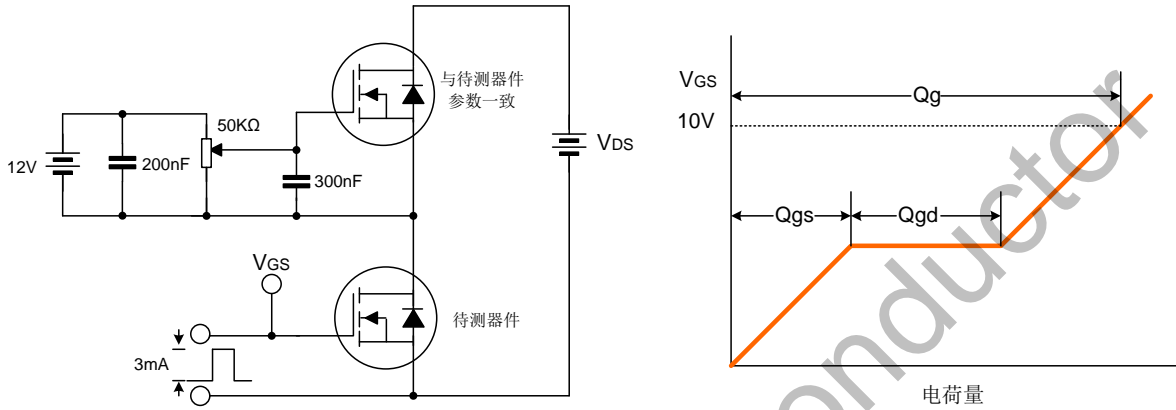


图9-1. 最大安全工作区域

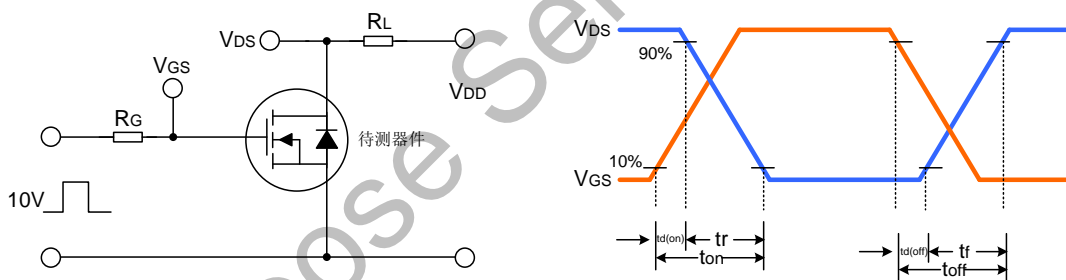


典型测试电路

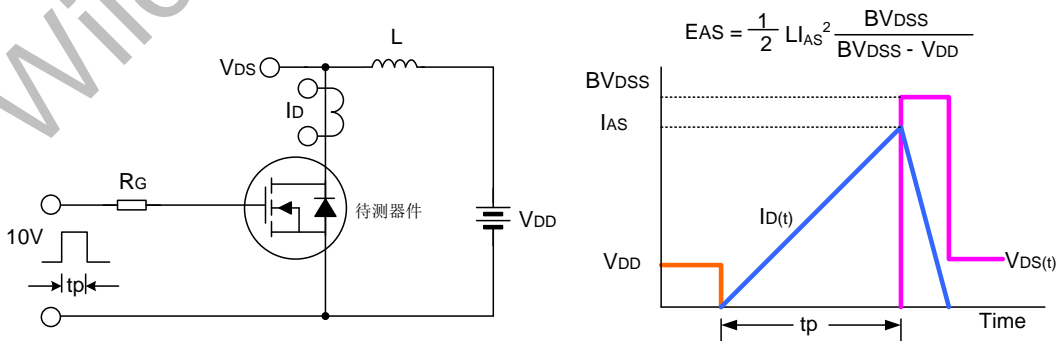
栅极电荷量测试电路及波形图



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

