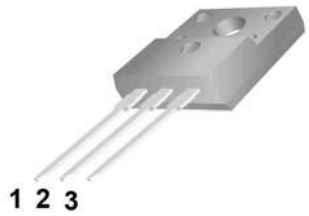
WGF60R160L

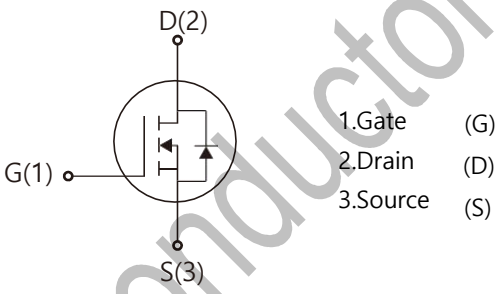
Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg=49 nC(Typ.).
- ☐ V_{DSS}=600 V,I_D=20 A
- ☐ R_{DS}(on) : 0.19 Ω (Max) @V_G=10V
- ☐ 100% Avalanche Tested

TO-220F

RoHS COMPLIANT





Absolute Maximum Ratings (Ta=25℃ unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{DSS}	Drain-Source Voltage		600	V
I_D	Drain Current	T_j=25℃	20	A
		T_j=100℃	12	
V_{GSS}	Gate-Source Voltage		±30	V
E_{AS}	Single Pulse Avalanche Energy (note1)		1062	mJ
I_{DM}	Pulsed Drain Current (note2)		20	A
P_D	Power Dissipation (Tj=25℃)		47	W
T_j	Junction Temperature(Max)		150	℃
T_{stg}	Storage Temperature		-55~+150	℃
dv/dt	MOSFET dv/dt ruggeness,VDS=0V...480V		50	V/nS

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction to Case	-	2.66	℃/W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	-	62.5	℃/W

Electrical Characteristics (Ta=25℃ unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Off Chara cteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250μA , V_{GS} =0	600	-	-	V
△BVDSS/ △TJ	Breakdown Voltage Temperature Coefficient	I_D=250μA ,Reference to 25℃	-	0.59	-	V/℃
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=600V, V_{GS} =0V	-	-	10	μA
		V_{DS}=480V, Tj=125℃			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						
$V_{GS(TH)}$	Date Threshold Voltage	I_D=250μA,V_{DS}=V_{GS}	2	-	4	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	I_D=10A,V_{GS} =10V	-	0.16	0.19	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	V_{DS}=100V , V_{GS} =0 , f=1.0MHz	-	1480	-	pF
Coss	Output Capacitance		-	84	-	
Crss	Reverse Transfer Capacitance			4.8	-	
Sw itching Characteristics						
Td(on)	Turn-On Delay Time	V_{DD}=300V , I_D=20A R_G =25Ω (Note 3,4)	-	21	-	nS
Tr	Turn-on Rise Time		-	74	-	
Td(of f)	Turn-Off Delay Time		-	213	-	
Tf	Turn-Off Rise Time		-	65	-	
Qg	Total Gate Charge	V_{DS}=480V,V_{GS} =10V , I_D=20A (Note3,4)	-	49	-	nC
Qgs	Gate-Source Charge		-	12	-	
Qgd	Gate-Drain Charge		-	25	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Is	Max. Diode Forward Current	-	-	-	20	A
I_{SM}	Max. Pulsed Forward Current	-	-	-	80	
V_{SD}	Diode Forward Voltage	I_D=20A	-	-	1.4	V
Trr	Reverse Recovery Time	I_S=20A,V_{GS} =0V diF/dt=100A/μs (Note3)	-	442	-	nS
Qrr	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 $R_{\theta JA}$ 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 °C.
5) V_{DD}=100 V, V_{GS}=10 V, L=79.9 mH, starting T_j=25 °C.

典型特性曲线

图1. 输出特性

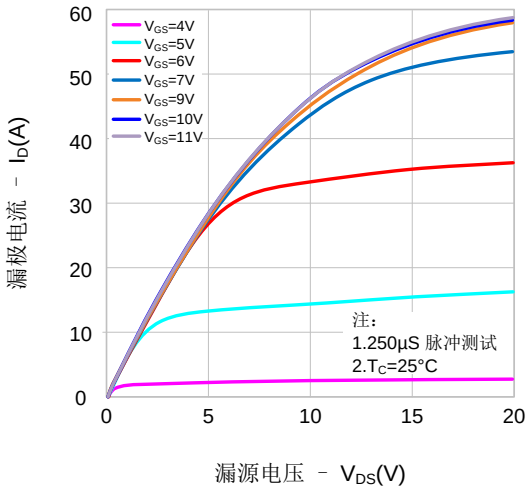


图2. 传输特性

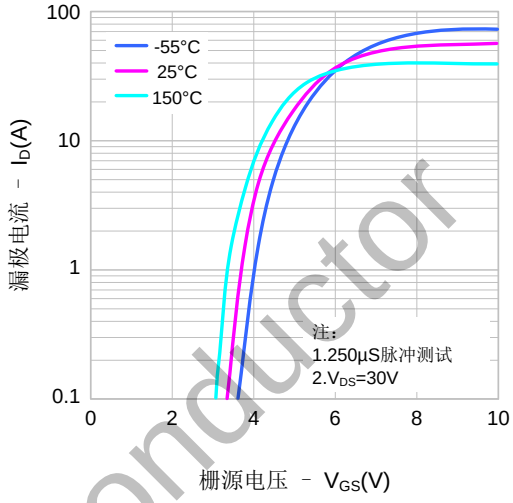


图3. 导通电阻vs.漏极电流

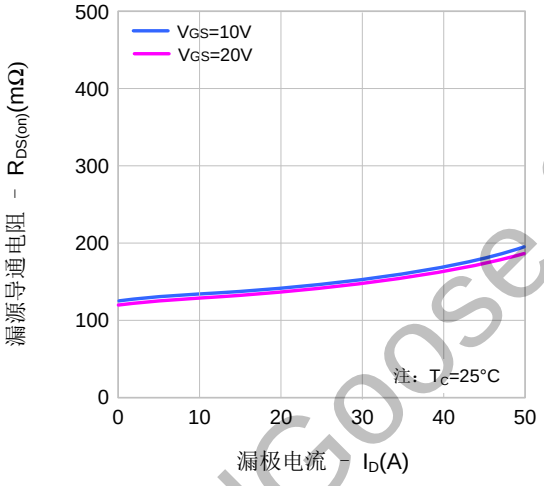


图4. 体二极管正向压降vs. 源极电流、温度

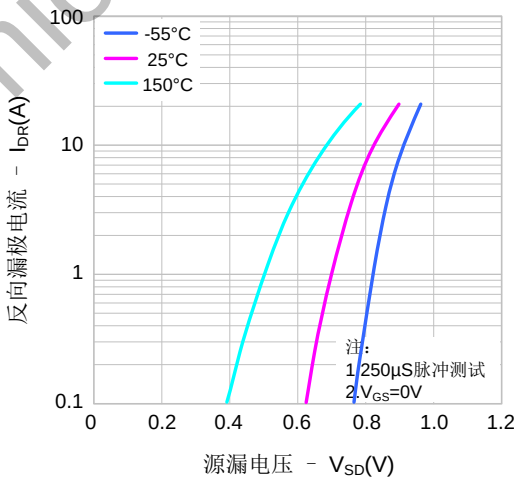


图5. 电容特性

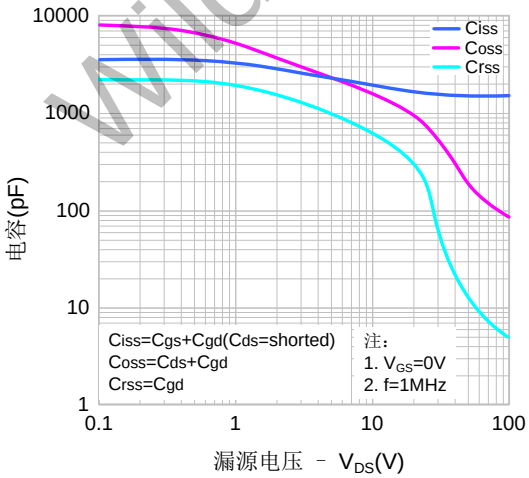
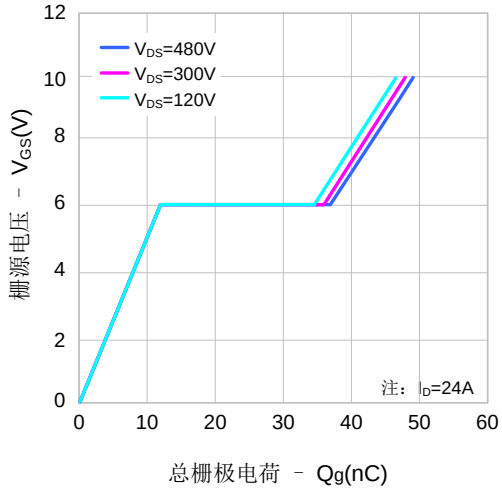


图6. 电荷量特性



典型特性曲线（续）

图7. 击穿电压vs.温度特性

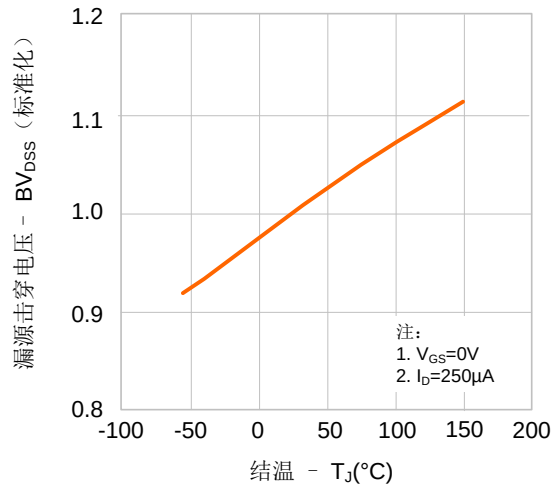


图8. 导通电阻vs.温度特性

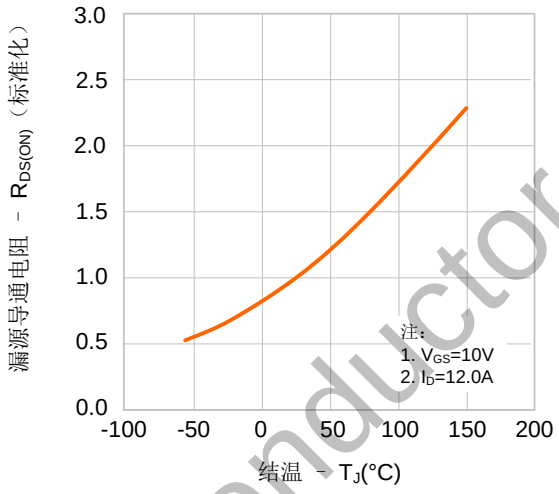
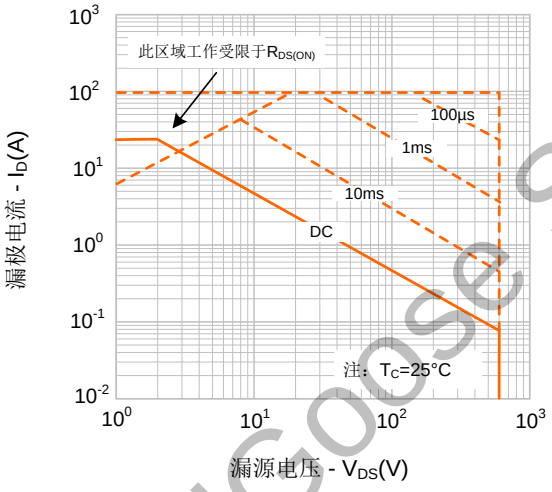
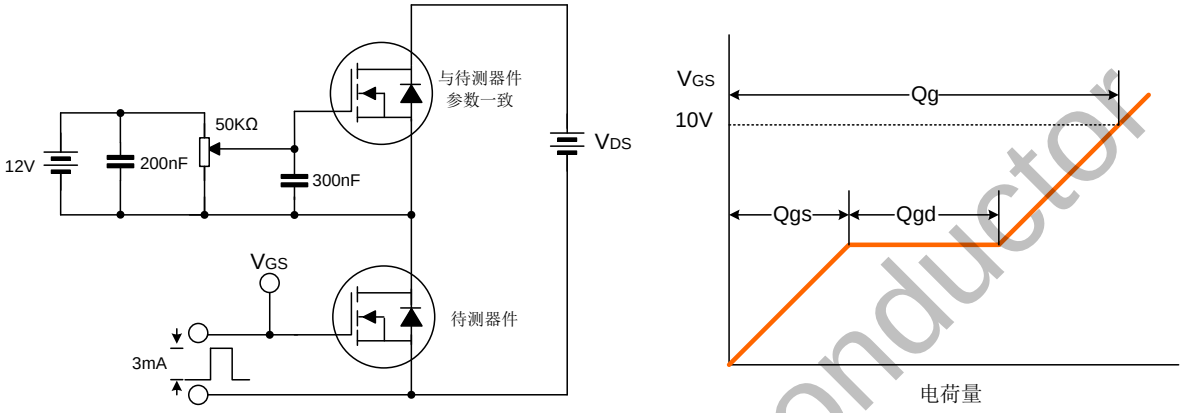


图9-1. 最大安全工作区域

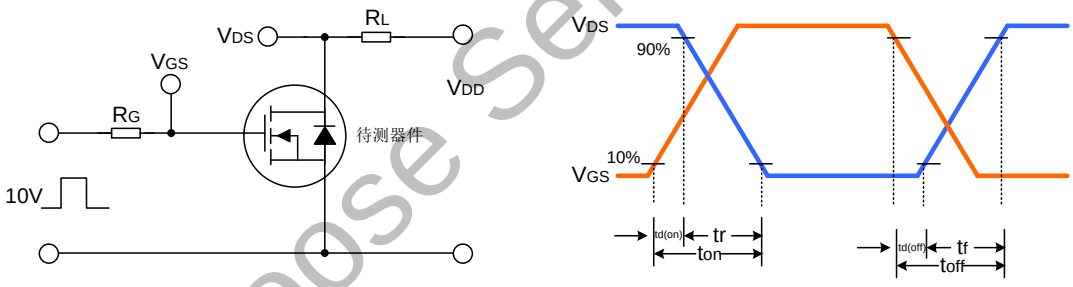


典型测试电路

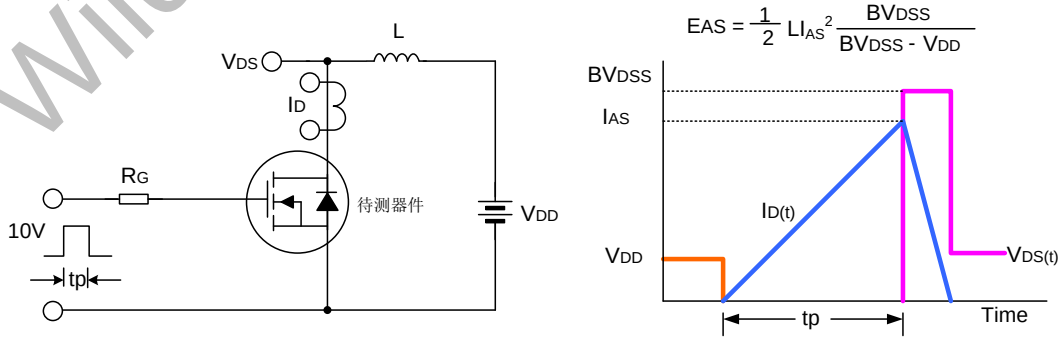
栅极电荷量测试电路及波形图



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