GMF20N65

N-channel 650V, 20A, TO-220F Power MOSFET 功率場效應管

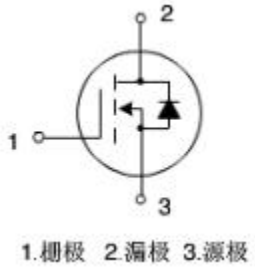
■Features 特點

Superior Avalanche Rugged Technology 高級雪崩加固技術
Improved dv/dt Capability 強力電壓變率能力
Fast switching 快速開關能力

■Applications 應用

Switch mode power supplies 開關電源
DC-DC converters and UPS 直流直流变换和不间断電源
Power Factor Correction (PFC) 功率因素校正

■Internal Schematic Diagram 內部結構



1.栅极 2.漏极 3.源极

■Absolute Maximum Ratings 最大額定值

Characteristic 特性參數	Symbol 符號	Rat 額定值	Unit 單位
Drain-Source Voltage 漏極-源極電壓	BV_{DSS}	650	V
Gate- Source Voltage 柵極-源極電壓	V_{GS}	±30	V
Drain Current (continuous)漏極電流-連續	I_D	20	A
Drain Current (pulse)漏極電流-脈衝	I_{DM}	80	A
Power Dissipation 耗散功率	P_D	167	W
Single Pulsed Avalanche Energy 雪崩能量	E_{AS}	1350*	mJ
Thermal Resistance ,Junction to Case 结对壳热阻	$R_{\theta JC}$	0.75	℃/W
Thermal Resistance ,Junction to Ambient 环境热阻	$R_{\theta JA}$	60	℃/W
Maximum Lead Solder Temperature 焊接溫度	T_L	260	℃
Junction/Storage Temperature 結溫/儲存溫度	T_J,T_{stg}	-55~150	℃

* V_{DD}=100V, V_G=10V, I_{AS}=14A, L=10mH, Starting T_J=25°C

■Electrical Characteristics 電特性

(T_A=25℃ unless otherwise noted 如無特殊說明，溫度爲 25℃)

Characteristic 特性參數	Symbol 符號	Min 最小值	Typ 典型值	Max 最大值	Unit 單位
Drain-Source Breakdown Voltage 漏極-源極擊穿電壓(I_D =250uA,V_{GS}=0V)	BV_{DSS}	650	—	—	V
Gate Threshold Voltage 柵極開启電壓(I_D =250uA,V_{GS}= V_{DS})	$V_{GS(th)}$	2	3	4	V
Zero Gate Voltage Drain Current 零柵壓漏極電流(V_{GS}=0V, V_{DS}= 500V)	I_{DSS}	—	—	1	uA
Gate Body Leakage 柵極漏電流(V_{GS}=±30V, V_{DS}=0V)	I_{GSS}	—	—	±100	nA
Static Drain-Source On-State Resistance 静态漏源導通電阻(I_D=10A,V_{GS}=10V)	$R_{DS(ON)}$	—	0.35	0.45	Ω
Input Capacitance 輸入電容 (V_{GS}=0V, V_{DS}=25V,f=1MHz)	C_{ISS}	—	2978	—	pF
Common Source Output Capacitance 共源輸出電容(V_{GS}=0V, V_{DS}=25V,f=1MHz)	C_{OSS}	—	291	—	pF
Reverse Transfer Capacitance 回饋電容 (V_{GS}=0V, V_{DS}=25V,f=1MHz)	C_{RSS}	—	40	—	pF
Total Gate Charge 總柵極電荷密度 (V_{DS}=520V, I_D=20A, V_{GS}=10V)	Q_g	—	80	—	nC
Gate Source Charge 柵源電荷密度 (V_{DS}=520V, I_D=20A, V_{GS}=10V)	Q_{gs}	—	12	—	nC
Gate Drain Charge 柵漏電荷密度 (V_{DS}=520V, I_D=20A, V_{GS}=10V)	Q_{gd}	—	34	—	nC
Turn-ON Delay Time 開启延遲時間 (V_{DS}=325V, I_D=20A, R_{GEN}=10Ω,V_{GS}=10V)	$td_{(on)}$	—	37	—	ns
Rise Time 上升時間 (V_{DS}=325V, I_D=20A, R_{GEN}=10Ω,V_{GS}=10V)	tr	—	66	—	ns
Turn-OFF Delay Time 關断延遲時間 (V_{DS}=325V, I_D=20A, R_{GEN}=10Ω,V_{GS}=10V)	$td_{(off)}$	—	175	—	ns
Fall Time 下降時間 (V_{DS}=325V, I_D=20A, R_{GEN}=10Ω,V_{GS}=10V)	t_f	—	84	—	ns
Drain-Source Diode Forward Current 漏極-源極二極體正向電流	I_S	—	—	20	A
Diode Forward Voltage Drop 内附二極管正向壓降(I_{SD}=20A,V_{GS}=0V)	V_{SD}	—	—	1.5	V

Pulse Test:Pulse Width≤300μs， Duty cycle≤2%

■Typical Performance Characteristics 典型功能特性

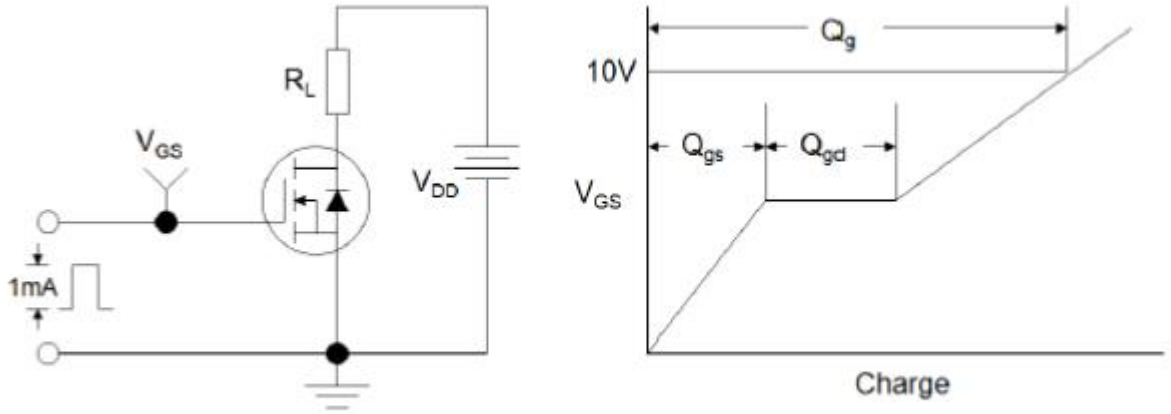


Figure1:Gate Charge Test Circuit & Waveform

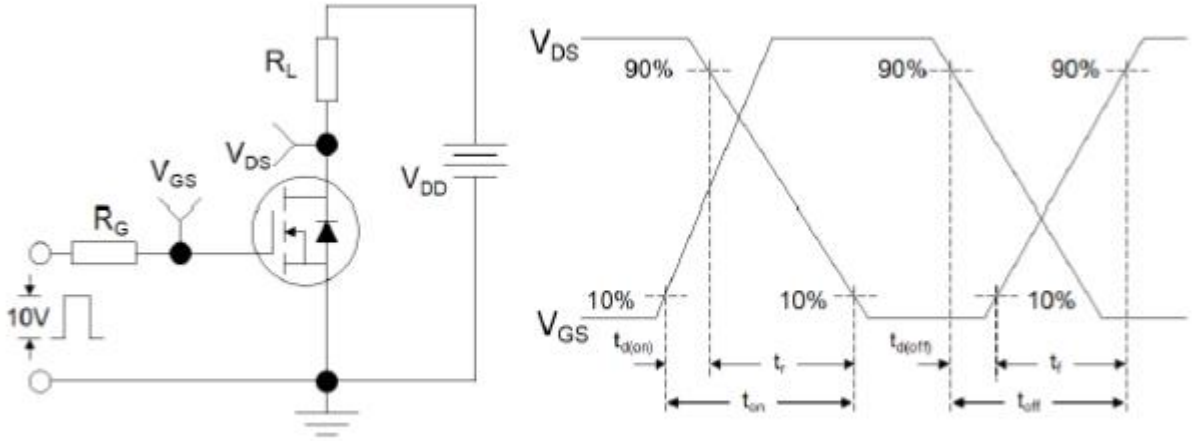


Figure 2: Resistive Switching Test Circuit & Waveforms

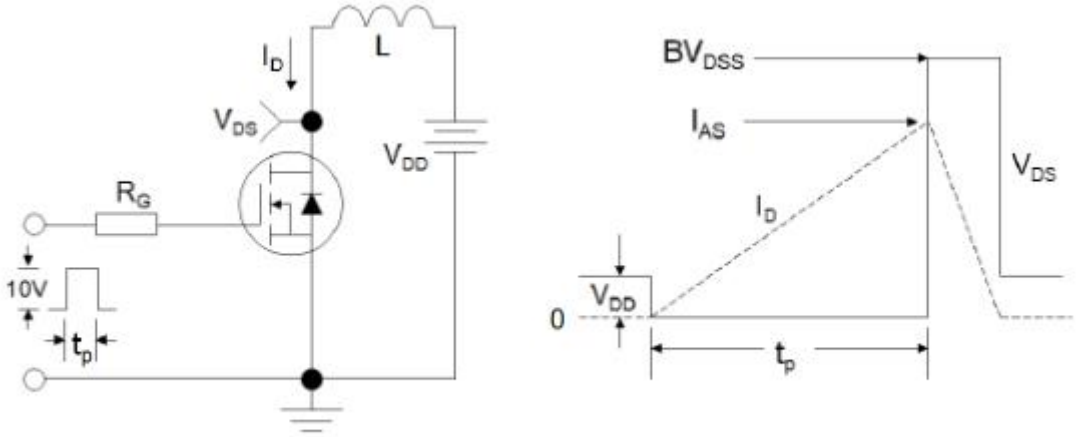


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

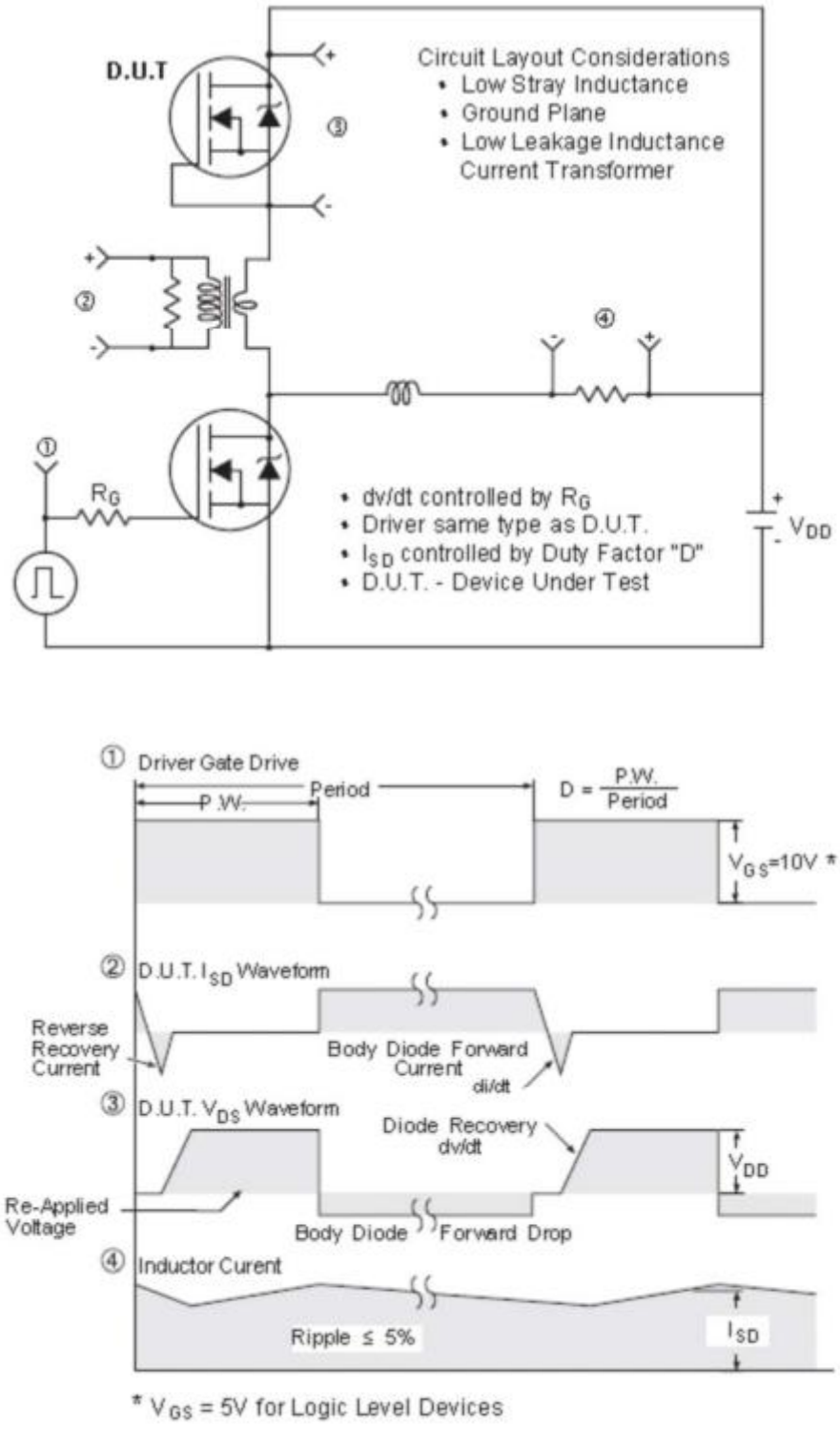
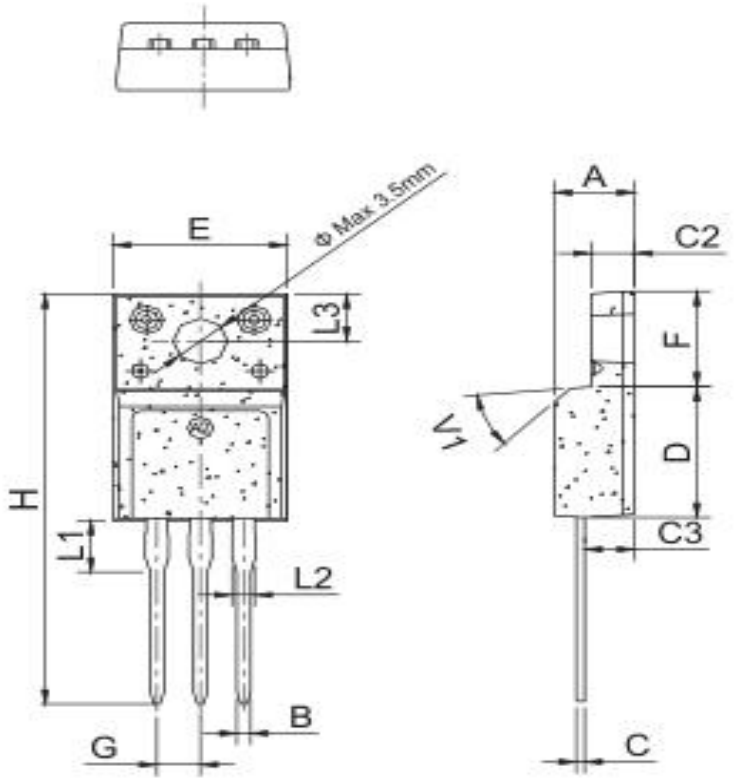


Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

■TO-220F 外形封裝尺寸(DIMENSION



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.50		4.90	0.177		0.193
B	0.74	0.80	0.83	0.029	0.031	0.033
C	0.47		0.65	0.019		0.026
C2	2.45		2.75	0.096		0.108
C3	2.60		3.00	0.102		0.118
D	8.80		9.30	0.346		0.366
E	9.80		10.4	0.386		0.410
F	6.40		6.80	0.252		0.268
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.63			0.143	
L2	1.14		1.70	0.045		0.067
L3		3.30			0.130	
V1		45°			45°	