SME18N50-U

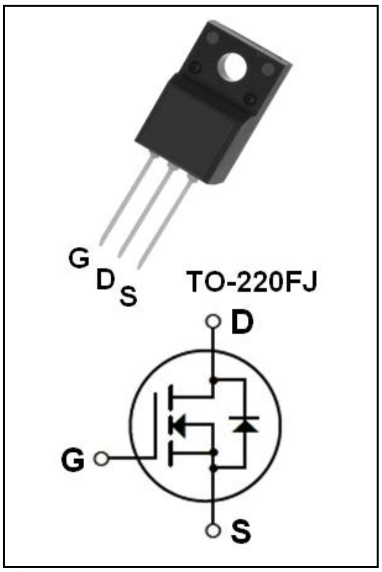
500V N-Channel MOSFET

● Features:

- 18.0A, 500V, $R_{DS(on)(Typ)}$ =270mΩ@V_{GS}=10V
- Low Gate Charge
- Low C_{rss}
- 100% Avalanche Tested
- Fast Switching
- Improved dv/dt Capability

● Application:

- High Frequency Switching Mode Power Supply
- Active Power Factor Correction



Absolute Maximum Ratings(Tc=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	500	V
I_D	Drain Current - Continuous(Tc=25°C)	18.0*	A
	- Continuous(Tc=100°C)	11.38*	A
I_{DM}	Drain Current -Pulsed (Note1)	72*	A
V_{GSS}	Gate-Source Voltage	±30	V
E_{AS}	Single Pulsed Avalanche Energy （Limit Reference Value） (Note2)	862	mJ
I_{AR}	Avalanche Current (Note1)	14.0	A
E_{AR}	Repetitive Avalanche Energy (Note1)	23.5	mJ
dv/dt	Peak Diode Recovery dv/dt (Note3)	4.5	V/ns
P_D	Power Dissipation(T_C =25°C)	60	W
	-Derate above 25°C	0.48	W/°C
Tj	Operating Junction Temperature	150	°C
Tstg	Storage Temperature Range	-55 to+150	°C

* Drain Current Limited by Maximum Junction Temperature.

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance,Junction to Case	2.08	°C /W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62.5	°C /W

Electrical Characteristics(Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Conditons	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain-source Breakdown Voltage	V_{GS}=0V ,I_D=250μA	500	--	--	V
$\triangle BV_{DSS}$ $/\triangle T_J$	Breakdown Voltage Temperature Coefficient	I_D=250μA (Referenced to 25°C)	--	0.55	--	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=500V,V_{GS}=0V	--	--	1	μA
		V_{DS}=400V,Tc=125°C	--	--	10	μA
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	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS}=10 V, I_D=9.0A	--	270	350	mΩ
g_{FS}	Forward Transconductance	V_{DS}=20 V, I_D=9.0A (Note4)	--	14	--	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V, f=1.0MHz	--	2620	--	pF
C_{oss}	Output Capacitance		--	243	--	pF
C_{rss}	Reverse Transfer Capacitance		--	9.5	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 250 V, I_D = 18 A, R_G = 25 Ω (Note4,5)	--	65	--	ns
t_r	Turn-On Rise Time		--	165	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	95	--	ns
t_f	Turn-Off Fall Time		--	90	--	ns
Q_g	Total Gate Charge	V_{DS} = 400 V, I_D =18 A, V_{GS} = 10 V (Note4,5)	--	45	--	nC
Q_{gs}	Gate-Source Charge		--	12.5	--	nC
Q_{gd}	Gate-Drain Charge		--	19	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	18	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	72	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} =0V,I_S=18 A	--	--	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS} =0V, I_S=18 A, d I_F /dt=100A/μs (Note4)	--	500	--	ns
Q_{rr}	Reverse Recovery Charge		--	5.4	--	μC

Notes:

1、Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.

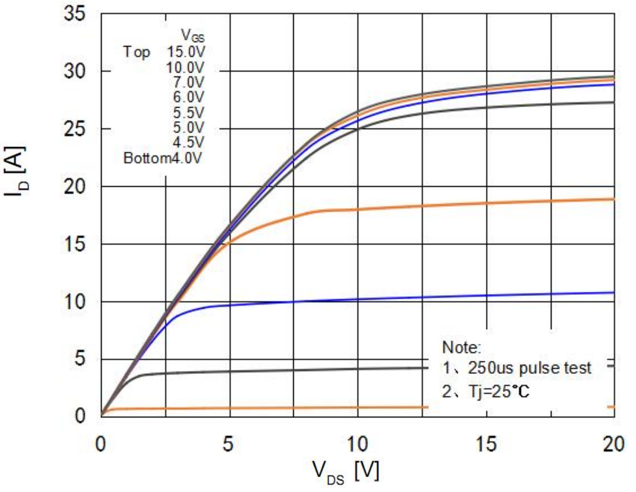
2、L = 8mH, I_{AS} =14.0A, V_{DD} = 80V, R_G = 25 Ω, Starting T_J = 25°C.

3、I_{SD}≤18.0A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, Starting T_J = 25°C.

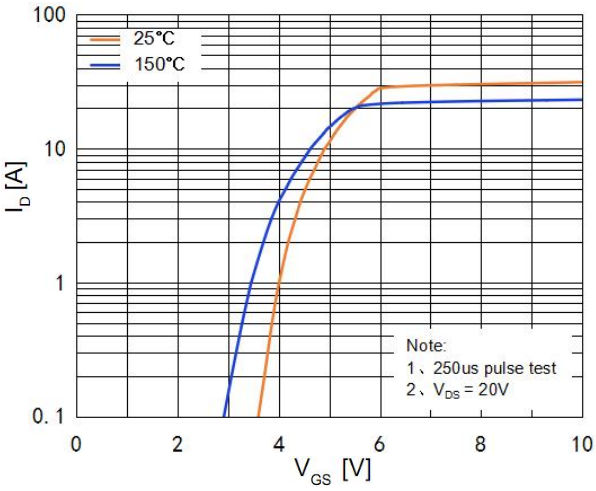
4、Pulse Test : Pulse Width ≤300 μ s, Duty Cycle≤2%.

5、Essentially Independent of Operating Temperature.

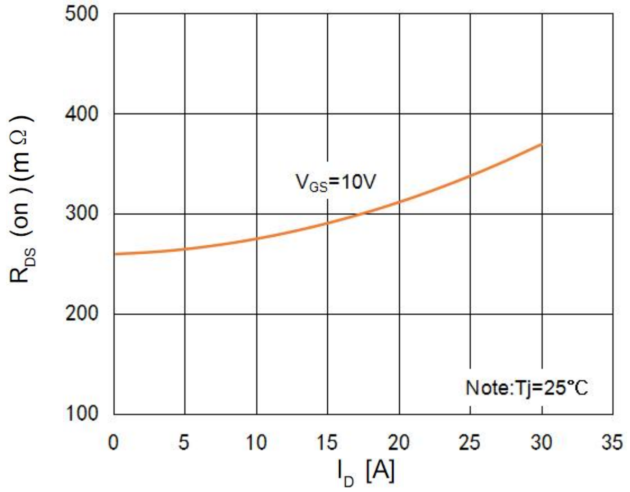
On-Regin Characteristics



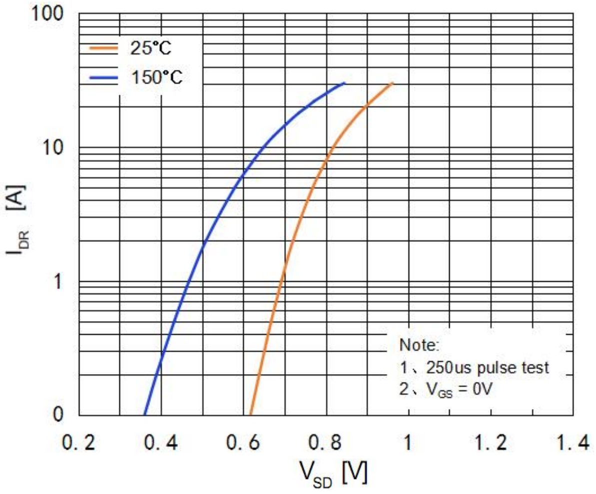
Transfer Characteristics



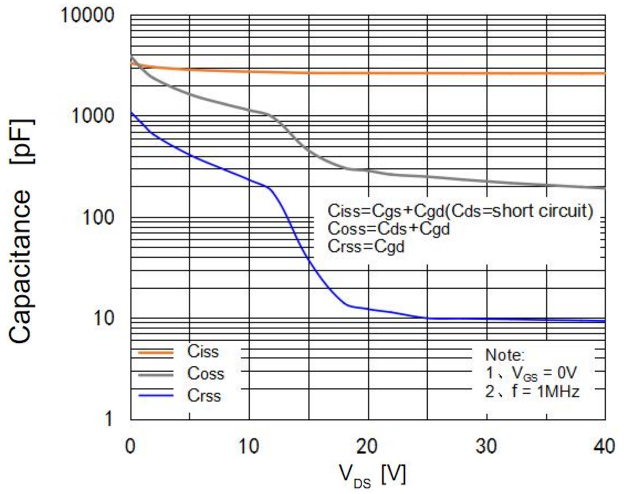
On-Resistance Variation vs. Drain Current and Gate Voltage



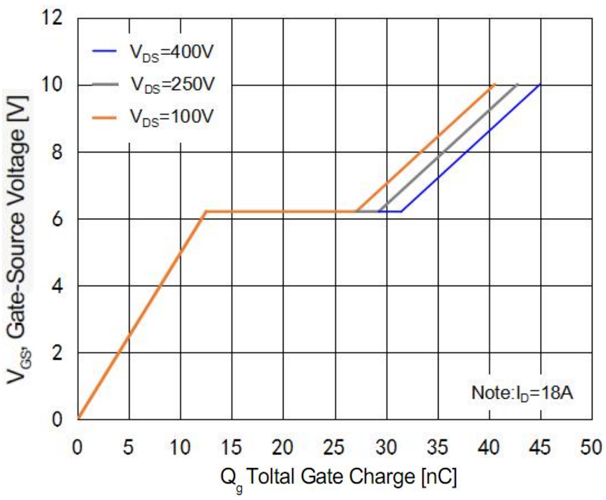
Body Diode Forward Voltage Variation vs. Source Current and Temperature



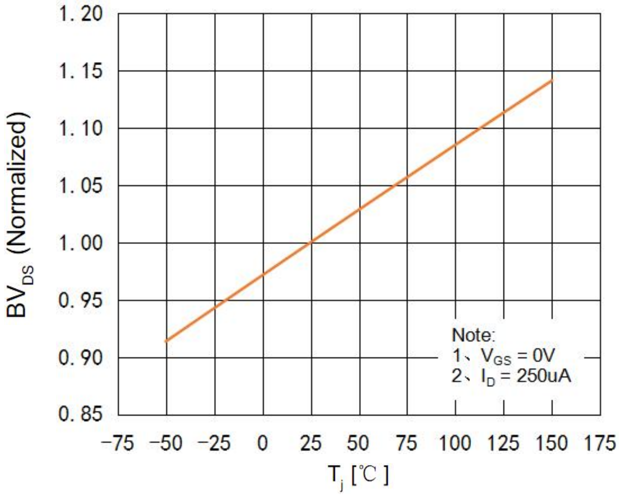
Capacitance Characteristics



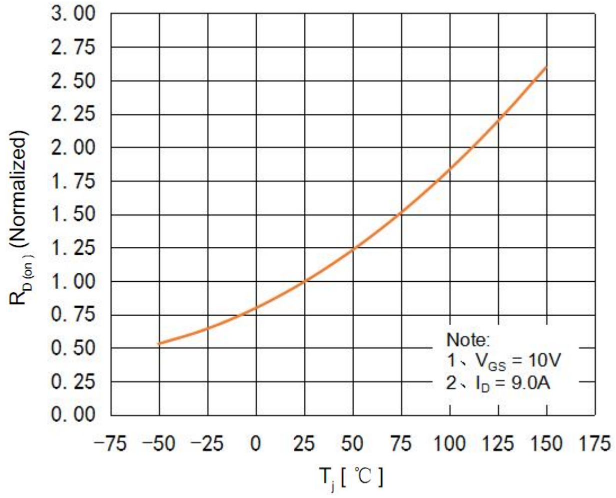
Gate Charge Characteristics



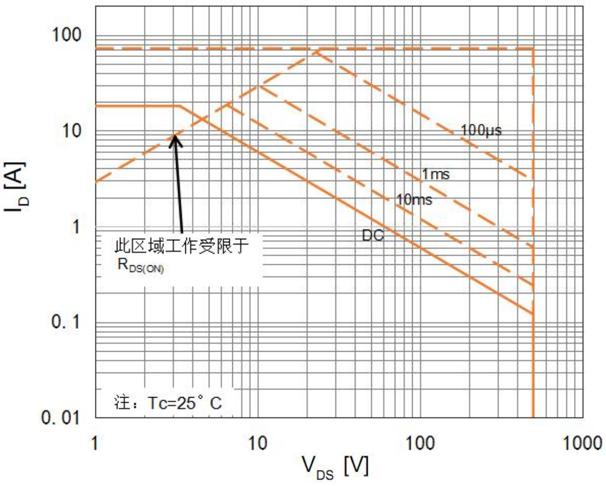
Breakdown Voltage Variation vs. Temperature



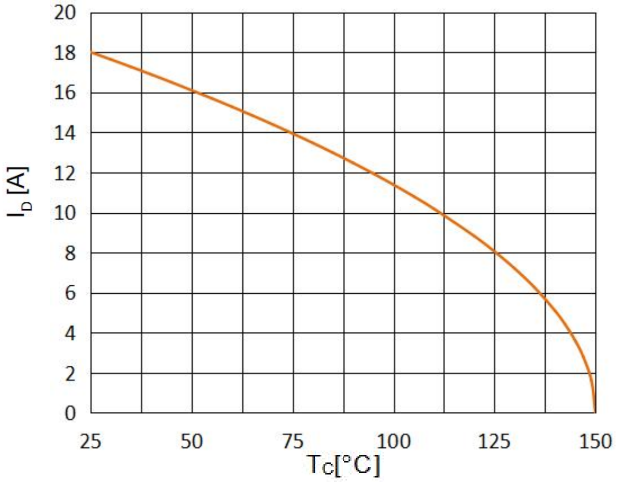
On-Resistance Variation vs. Temperature



Maximum Safe Operating Area



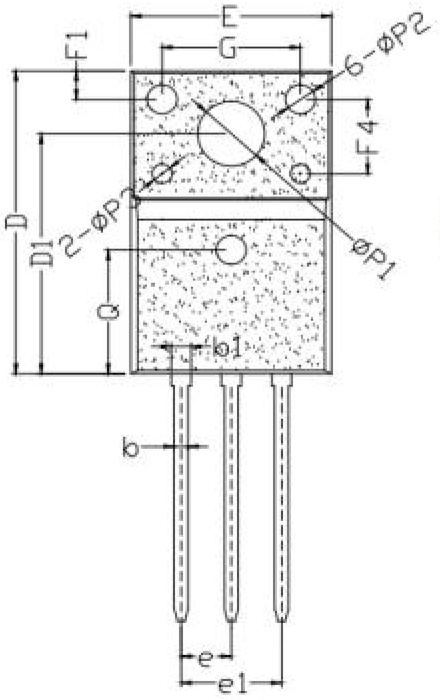
Maximum Drain Current Vs. Case Temperature

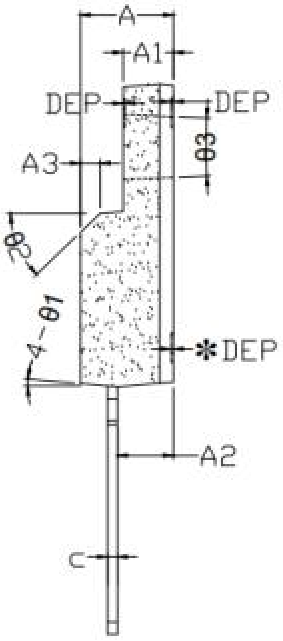


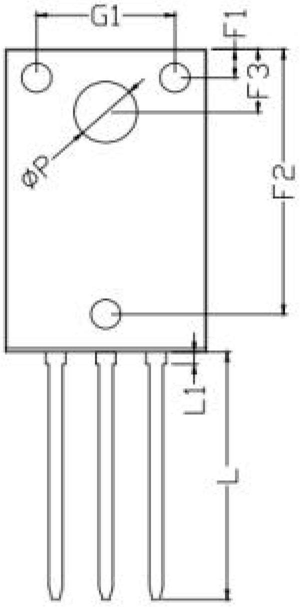
TO-220FJ（窄脚） Package Dimensions

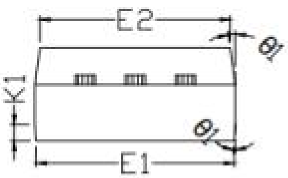
UNIT：mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	4.50	4.70	4.90	F3	3.10	3.30	3.50
A1	2.34	2.54	2.74	F4	3.70	3.90	4.10
A2	2.56	2.76	2.93	G1	6.80	7.00	7.20
A3	1.0REF			K1	0.60	0.70	0.80
b	0.60	0.70	0.80	L	11.98	12.98	13.98
b1	0.90	1.00	1.10	L1	-	-	0.95
c	0.40	0.50	0.60	Q	6.50REF		
D	15.47	15.87	16.27	ΦP	2.98	3.18	3.38
D1	12.17	12.57	12.97	ΦP1	3.20	3.40	3.60
e	2.54REF			ΦP2	1.30	1.50	1.70
e1	5.08REF			ΦP3	0.80	1.00	1.20
E	9.86	10.16	10.46	θ1	3°	5°	7°
E1	9.76	10.06	10.36	θ2	40°	45°	50°
E2	9.10	9.40	9.70	θ3	3°	5°	7°
F1	1.30	1.50	1.70	DEF	0.05	0.10	0.20
F2	13.60	13.90	14.20				









注意事项：

1、在电路设计时请不要超过器件的最大额定值，否则会影响整机的可靠性。

2、MOSFET产品为静电敏感型器件，使用时应注意采取防静电保护措施，如佩戴防静电手环、设备接地等。

3、如需安装散热片，请注意控制扭力大小及散热片的平整度。

4、该规格书由华科公司制作，并可能不定期更改，恕不另行通知。

5、如有疑问，请及时联系我司销售代表。

版本履历表：

序号	版本号	修改时间	修改记录
1	V1.0	2023-9-28	首次发行