



MS65R120

主要参数 MAIN CHARACTERISTICS

I_D	30A
V_{DS}	650 V
$R_{DS(on)-max}$ (@ $V_{GS}=10V$)	0.120 Ω
Q_g-typ	58.4 nC

用途

- 高频开关电源
- 电子镇流器
- LED 电源

APPLICATIONS

- High frequency switching mode power supply
- Electronic ballast
- LED power supply

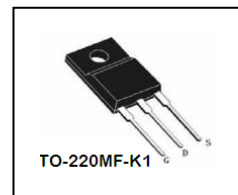
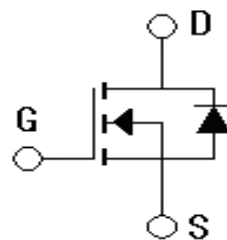
产品特性

- 低栅极电荷
- 开关速度快
- 产品全部经过雪崩测试
- 高抗 dv/dt 能力
- RoHS 产品
- 超结产品

FEATURES

- Low gate charge
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product
- Super Junction MOS

封装 Package



订货信息 ORDER MESSAGE

订货型号 Order codes				印 记 Marking	封 装 Package
有卤-条管	无卤-条管	有卤-编带	无卤-编带		
Halogen-Tube	Halogen-Free-Tube	Halogen-reel	Halogen-Free-Reel		
MS65R120-F1-B	MS65R120-F1-BR	N/A	N/A	MS65R120	TO-220MF-K1



绝对最大额定值 ABSOLUTE RATINGS ($T_c=25^{\circ}\text{C}$)

项 目 Parameter	符 号 Symbol	数 值 Value	单 位 Unit
		MS65R120/TO-220MF-K1	
最高漏极—源极直流电压 Drain-Source Voltage	V_{DSS}	650	V
连续漏极电流 Drain Current -continuous	I_{D} $T=25^{\circ}\text{C}$	30*	A
	$T=100^{\circ}\text{C}$	18*	A
最大脉冲漏极电流 (注 1) Drain Current - pulse (note 1)	I_{DM}	90*	A
最高栅源电压 Gate-Source Voltage	V_{GSS}	± 30	V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	E_{AS}	250	mJ
雪崩电流 (注 1) Avalanche Current (note 1)	I_{AR}	5	A
重复雪崩能量 (注 1) Repetitive Avalanche Energy (note 1)	E_{AR}	0.5	mJ
二极管反向恢复最大电压变 化速率 (注 3) Peak Diode Recovery dv/dt (note 3)	dv/dt	15	V/ns
耗散功率 Power Dissipation	P_{D} $T_{\text{C}}=25^{\circ}\text{C}$	45	W
	-Derate above 25°C	0.36	W/ $^{\circ}\text{C}$
最高结温及存储温度 Operating and Storage Temperature Range	$T_{\text{J}}, T_{\text{STG}}$	$-55 \sim +150$	$^{\circ}\text{C}$
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_{L}	300	$^{\circ}\text{C}$

*漏极电流由最高结温限制

*Drain current limited by maximum junction temperature





电特性 ELECTRICAL CHARACTERISTICS

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单 位 Units
关态特性 Off –Characteristics						
漏—源击穿电压 Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	650	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A$, referenced to $25^\circ C$	-	0.65	-	V/ $^\circ C$
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V, T_C=25^\circ C$	-	-	1	μA
		$V_{DS}=650V, T_C=125^\circ C$	-	-	100	μA
正向栅极体漏电流 Gate-body leakage current, forward	I_{GSSF}	$V_{DS}=0V, V_{GS}=30V$	-	-	100	nA
反向栅极体漏电流 Gate-body leakage current, reverse	I_{GSSR}	$V_{DS}=0V, V_{GS}=-30V$	-	-	-100	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	2.5	-	4.5	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=15A$	-	0.107	0.12	Ω
正向跨导 Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=15A$ (note 4)	-	20.9	-	S
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{iss}	$V_{DS}=100V, V_{GS}=0V, f=1.0MHz$	-	2598	-	pF
输出电容 Output capacitance	C_{oss}		-	96	-	pF
反向传输电容 Reverse transfer capacitance	C_{rss}		-	44	-	pF



**电特性 ELECTRICAL CHARACTERISTICS**

开关特性 Switching Characteristics							
延迟时间 Turn-On delay time	t _{d(on)}	V _{DD} =325V,I _D =30A,R _G =25Ω, V _{GS} =10V (note 4, 5)	-	41	-	ns	
上升时间 Turn-On rise time	t _r		-	75	-	ns	
延迟时间 Turn-Off delay time	t _{d(off)}		-	165	-	ns	
下降时间 Turn-Off Fall time	t _f		-	68	-	ns	
栅极电荷总量 Total Gate Charge	Q _g	V _{DS} =520V , I _D =20A V _{GS} =10V (note 4, 5)	-	58	-	nC	
栅—源电荷 Gate-Source charge	Q _{gs}		-	19	-	nC	
栅—漏电荷 Gate-Drain charge	Q _{gd}		-	19	-	nC	
漏—源二极管特性及最大额定值 Drain-Source Diode Characteristics and Maximum Ratings							
正向最大连续电流 Maximum Continuous Drain -Source Diode Forward Current	I _S		-	-	26	A	
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}		-	-	90	A	
正向压降 Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =15A	-	0.9	1.2	V	
反向恢复时间 Reverse recovery time	t _{rr}	V _r =400V, I _F = I _S dI _F /dt=100A/μs (note 4)	-	365	-	ns	
反向恢复电荷 Reverse recovery charge	Q _{rr}		-	5.9	-	μC	

热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大 Max MS65R120/TO-220MF-K1	单 位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	2.78	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	47.6	$^{\circ}C/W$

注释:

- 1: 脉冲宽度由最高结温限制
- 2: $I_{AS}=5A, V_{DD}=50V, R_G=25\Omega$, 起始结温 $T_J=25^{\circ}C$
- 3: $I_{SD}\leq 11A, di/dt\leq 300A/\mu s, V_{DD}\leq BV_{DSS}$, 起始结温 $T_J=25^{\circ}C$
- 4: 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 2\%$
- 5: 基本与工作温度无关

Notes:

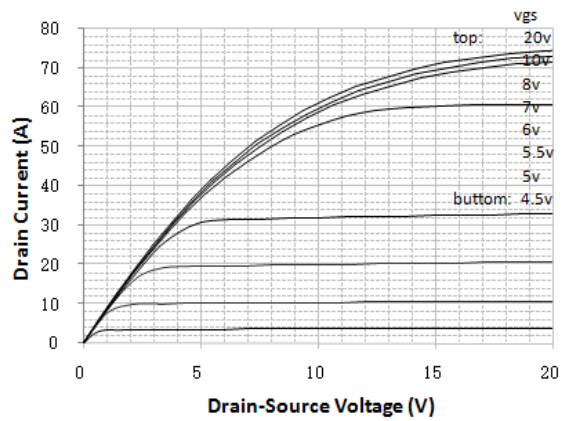
- 1: Pulse width limited by maximum junction temperature
- 2: $I_{AS}=1.8A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$
- 3: $I_{SD}\leq 11A, di/dt\leq 300A/\mu s, V_{DD}\leq BV_{DSS}$, Starting $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$
- 5: Essentially independent of operating temperature



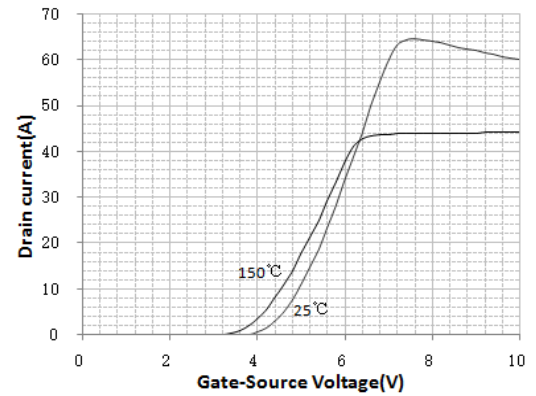


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

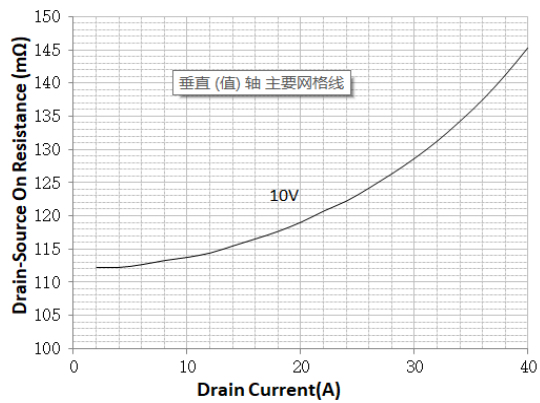
On-Region Characteristics



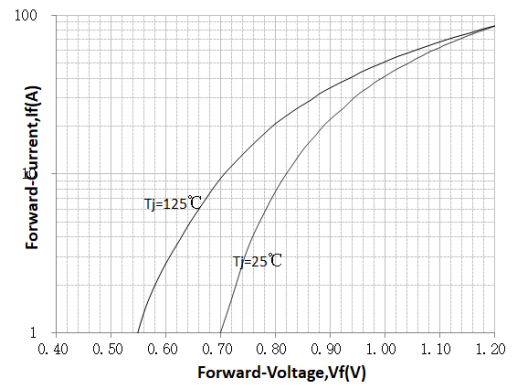
Transfer Characteristics



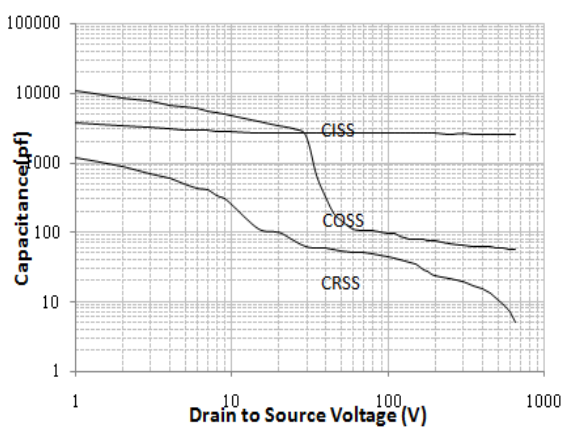
On-Resistance Variation vs. Drain Current and Gate Voltage



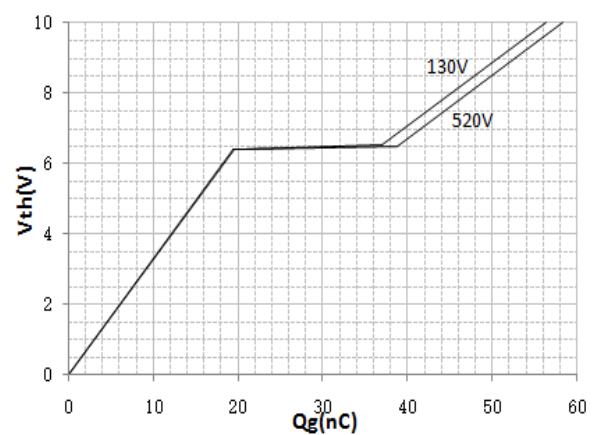
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Gate Charge Characteristics

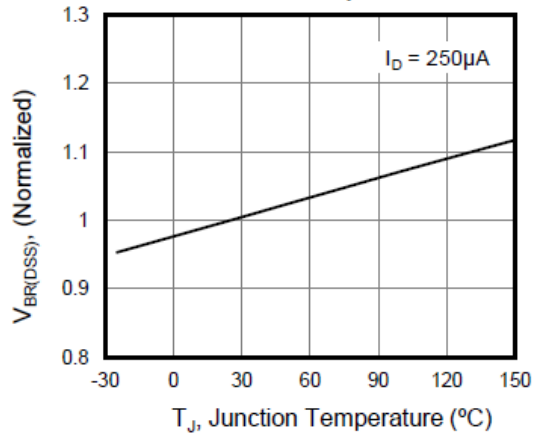


Capacitance Characteristics

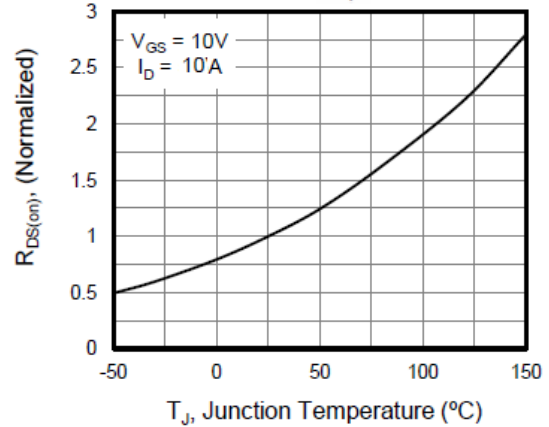


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

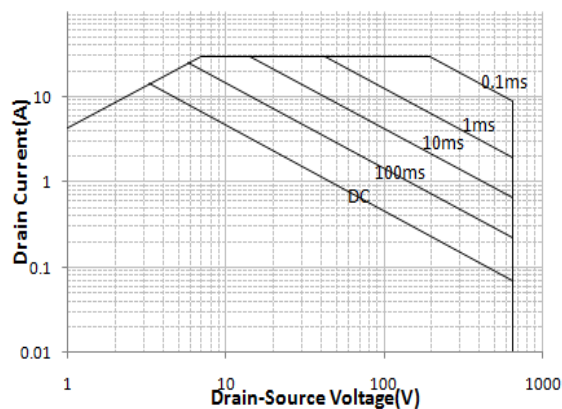
**Breakdown Voltage Variation
vs. Temperature**



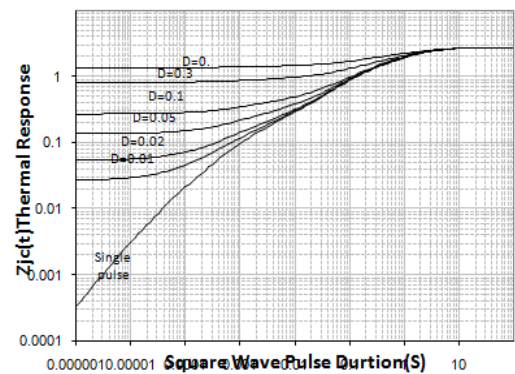
**On-Resistance Variation
vs. Temperature**



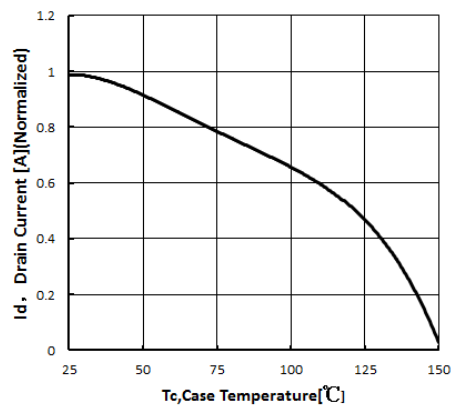
**Maximum Safe Operating Area
For MS65R120/TO-220MF-K1**



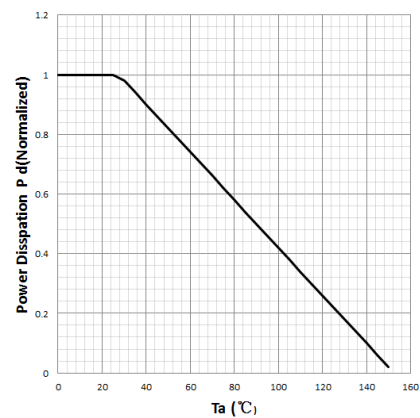
**Transient Thermal Response Curve
For MS65R120/TO-220MF-K1**



**Maximum Drain Current
vs. Case Temperature**



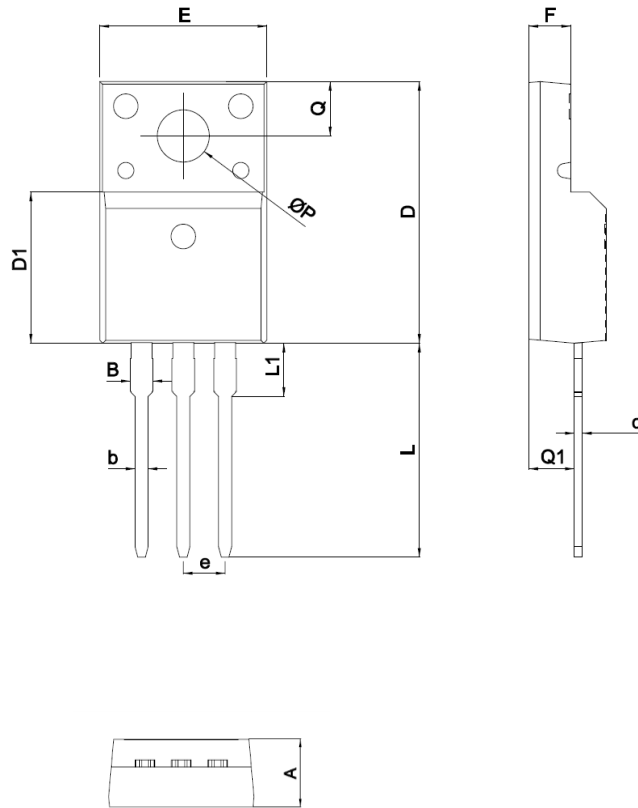
Power Dissipation vs. Temperature



外形尺寸 PACKAGE MECHANICAL DATA

TO-220MF-K1

单位 Unit: mm



SYMBOL	mm	
	MIN	MAX
A	4.5	4.9
B	1.22	1.47
b	0.7	0.9
c	0.45	0.60
D	15.6	16.1
D1	9.0	9.3
e	2.54TYPE	
E	9.9	10.4
F	2.3	2.8
L	12.6	13.3
L1	3.1	3.4
Q	3.2	3.4
Q1	2.6	2.9
ΦP	3.0	3.5



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