



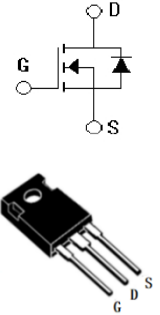
MMQ60R078RF

主要参数

Main Characteristics

I_D	50A
V_{DS}	600 V
$R_{DS(on)}$ (max)	0.078 Ω

封装 Pack



用途

软开关应用
伺服器电源
电信电源
电动汽车充电桩

Applications

soft-switching Application
Server power supply
Telecom
EV charging

产品特性

超快体二极管
高速开关和低导通电阻实现低功率损耗
产品全部经过雪崩测试
RoHS 产品

Features

Ultra-fast Body Diode
Low Power Loss by High Speed Switching and Low On-Resistance
100% avalanche tested
RoHS product

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
最高漏极—源极直流电压 Drain-Source Voltage	V_{DS}	600	V
连续漏极电流（注 1） Drain Current -continuous (note 1)	I_D	$T_c=25^{\circ}\text{C}$ 50	A
		$T_c=100^{\circ}\text{C}$ 31.6	
最大脉冲漏极电流（注 2） Drain Current – pulse (note 2)	I_{DM}	150	A
最高栅源电压 Gate-Source Voltage	V_{GS}	± 30	V
耗散功率 Power Dissipation	P_D	266	W
单脉冲雪崩能量（注 3） Single Pulsed Avalanche Energy (note 3)	E_{AS}	1130	mJ
MOSFET最大电压变化速率 MOSFET dv/dt	dv/dt	50	V/ns
体二极管最大电压变化速率（注 4） Diode dv/dt (note 4)	dv/dt	50	V/ns
最高结温 Operating Junction Temperature	T_J	+150	$^{\circ}\text{C}$
存储温度 Storage Temperature Range	T_{STG}	-55~+150	$^{\circ}\text{C}$

*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 =250μA, V _{GS} =0V	600	-	-	V
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V, V _{GS} =0V, TC=25℃	—	—	13	μA
正向栅极体漏电流 Forward Gate-body leakage current	I _{GSSF}	V _{DS} =0V, V _{GS} =+30V	-	-	100	nA
反向栅极体漏电流 Reverse Gate-body leakage current	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 =250μA	3.0	4.0	5.0	V
静态导通电阻 Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V , I _D =25A	-	0.066	0.078	Ω
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C _{iss}	V _{DS} =400V,V _{GS} =0V f=400KHz	-	3490	-	pF
输出电容 Output capacitance	C _{oss}		-	87	-	pF
反向传输电容 Reverse transfer capacitance	C _{rss}		-	13	-	pF
开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	t _{d(on)}	V _{GS} =10V V _{DD} =300V I _D =50A R _G =2Ω	-	33	-	ns
上升时间 Turn-On rise time	t _r		-	160	-	ns
延迟时间 Turn-Off delay time	t _{d(off)}		-	76	-	ns
下降时间 Turn-Off Fall time	t _f		-	4.7	-	ns
栅极电荷总量 Total Gate Charge	Q _g	V _{DS} =480V ,I _D =45A	-	88	-	nC
栅—源电荷 Gate-Source charge	Q _{gs}	V _{GS} =10V	-	28	-	nC
栅—漏电荷 Gate-Drain charge	Q _{gd}		-	35	-	nC
栅极电阻 Gate resistance	R _g	V _{GS} =0V,f=1MHz	-	5	-	Ω

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		IS	-	-	50	A
正向最大脉冲电流 Maximum Pulsed Drain-Source		ISM	-	-	80	A
正向压降 Drain-Source Diode Forward	VFSD	VGS=0V, IS=50A	-	-	1.4	V
反向恢复时间 Reverse recovery time	trr	VDD=100V, IS=50A dIF/dt=100A/μs	-	280	-	ns
反向恢复电荷 Reverse recovery charge	Qrr		-	2.69	-	μC
反向恢复电流 Reverse recovery current	Irrm		-	18.8	-	A

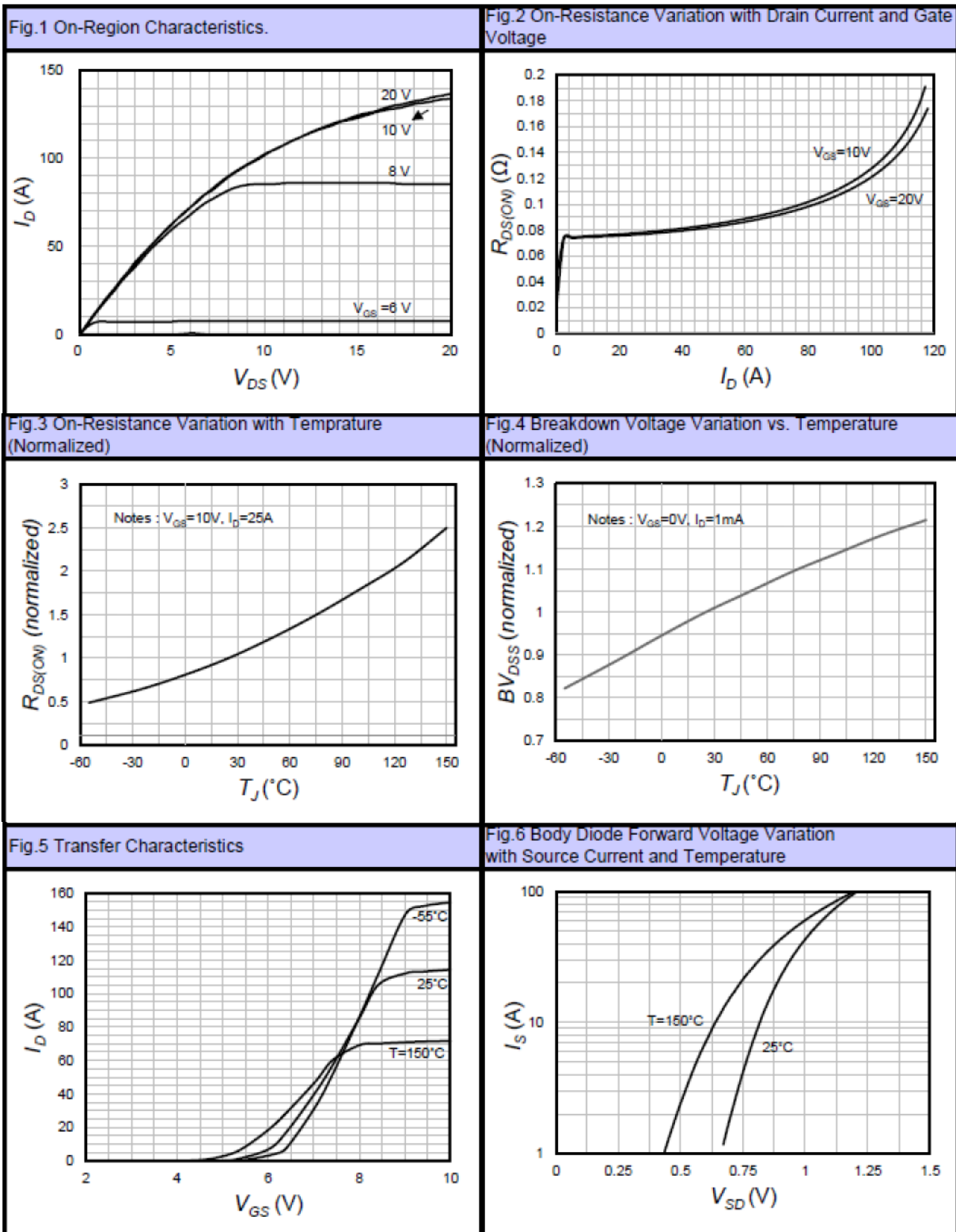
热特性 Thermal Characteristics

项 目 Parameter	符 号 Symbol	最大 Max	单 位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	0.47	℃/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	45.1	℃/W

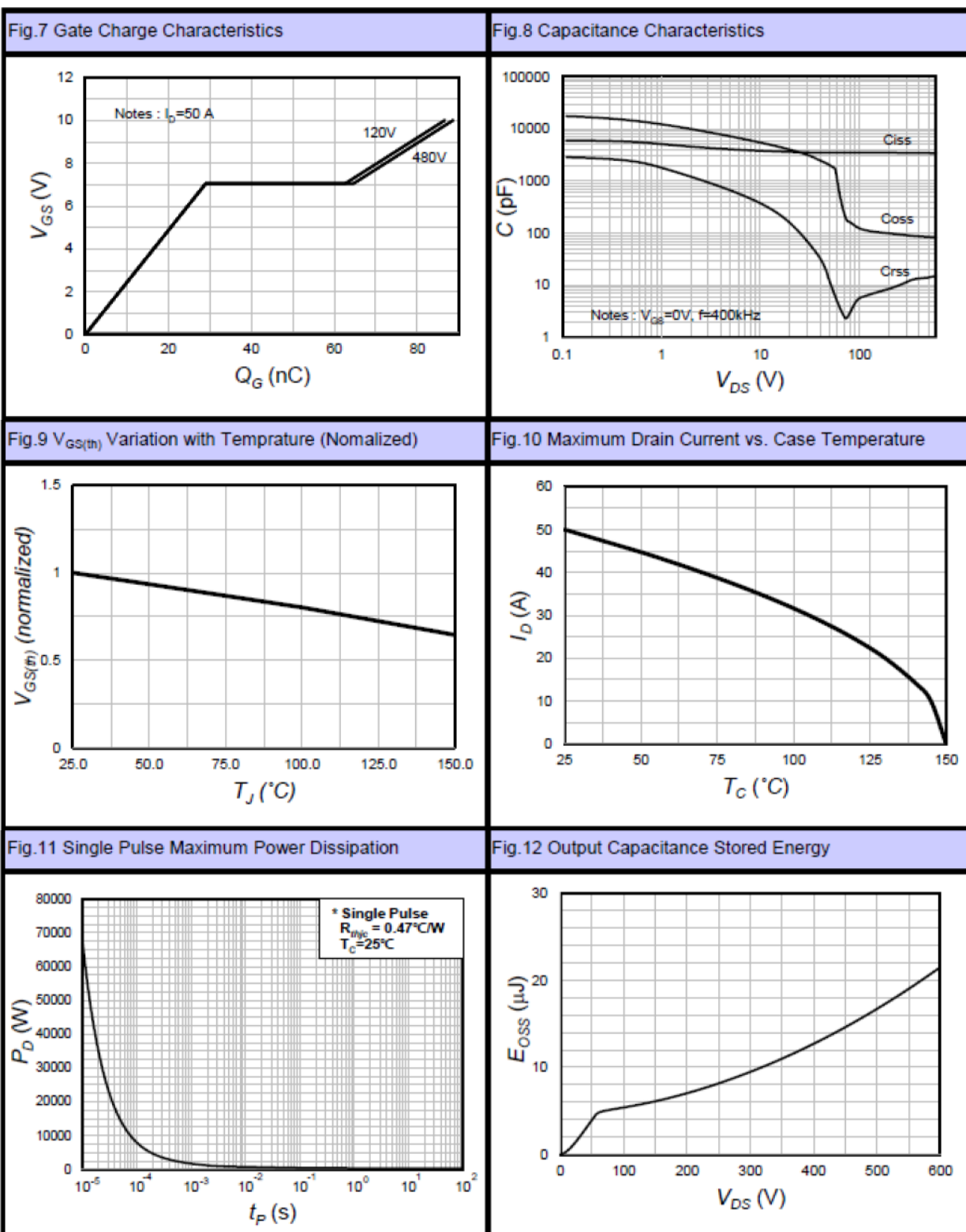
注释:

1: I_D limited by maximum junction temperature2: Pulse width t_p limited by $T_{j,max}$ 3: $I_{AS}=9A$ 4: $I_{SD} \leq I_D, di/dt=1000A/\mu s, V_{DS\ peak} \leq V_{(BR)DSS}, V_{DD}=400V, T_j=25^\circ C$

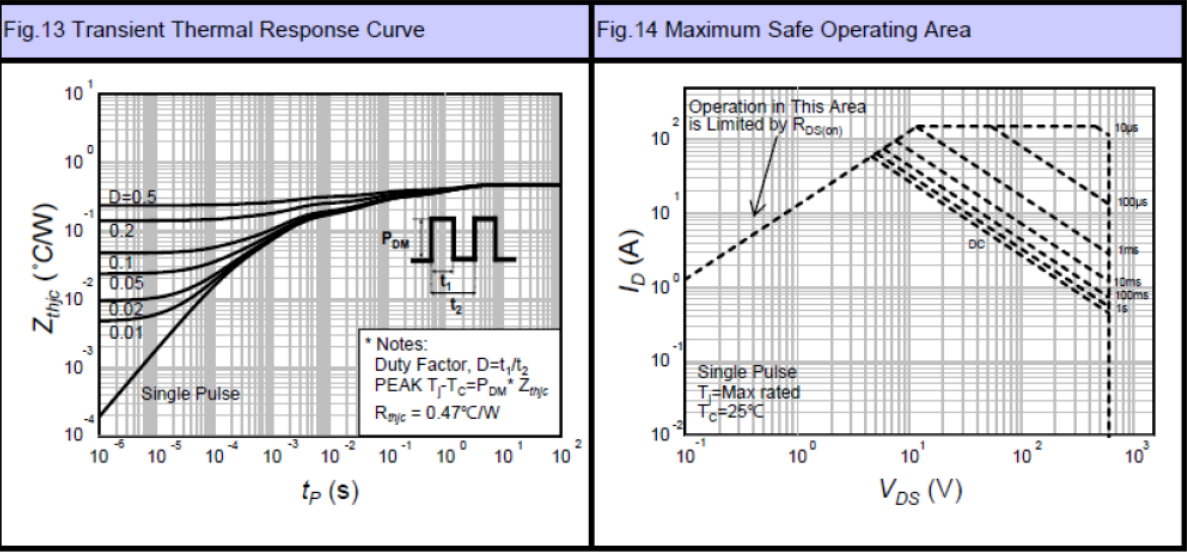
特征曲线 ELECTRICAL CHARACTERISTICS (curves)



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外形尺寸 PACKAGE MECHANICAL DATA

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