

SIC65R550FC

主要参数 Main Characteristics

I_D	7A
V_{DS}	650V
$R_{ds(on)} (@V_{GS}=10V)_{typ}$	550m Ω

用途

高频开关电源
LED电源

Applications

High efficiency switch mode power supplies
LED power supplies

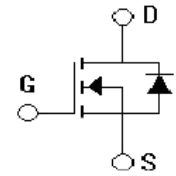
产品特性

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

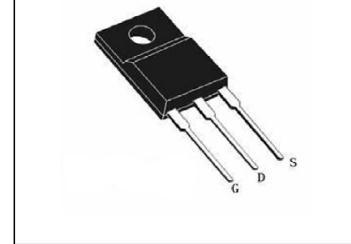
Features

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

封装 Package



TO-220F



产品中有毒有害物质或元素的名称及含量

部件名称 含量要求	有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
	≤0.1%	≤0.1%	≤0.01%	≤0.1%	≤0.1%	≤0.1%
引线框	○	○	○	○	○	○
塑封树脂	○	○	○	○	○	○
管 芯	○	○	○	○	○	○
内引线	○	○	○	○	○	○
焊 料	×	○	○	○	○	○
说 明	○：表示该元素的含量在 SJ/T11363-2006 标准的限量要求以下。 ×：表示该元素的含量超出 SJ/T11363-2006 标准的限量要求。 目前产品的焊料中含有铅 (Pb) 成分，但属于欧盟 RoHS 指令豁免范围。					

绝对最大额定值 Absolute Ratings (T_c=25℃)

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 _{DSS}	650	V
连续漏极电流 Drain Current -continuous	I _D (T _C =25℃)	7	A
	I _D (T _C =100℃)	5	
最大脉冲漏极电流 (注 1) Drain Current – pulse (note 1)	I _{DM}	14	A
最高栅源电压 Gate-Source Voltage	V _{GSS}	-8/+22	V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	E _{AS}	24.5	mJ
重复雪崩能量 Repetive Avalanche Energy	E _{AR}	22.5	mJ
二极管反向恢复最大电压变化速率 Peak Diode Recovery dv/dt	dv/dt	50	V/ns
耗散功率 Power Dissipation	P _D (T _C =25℃)	35	W
	P _D (T _C =100℃)	17	
最高结温 Operating Junction Temperature	T _J	+175	℃
存储温度 Storage Temperature Range	T _{STG}	-40~+150	℃

*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	650	-	-	V
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℃	—	-	1	μA
		V _{DS} =650V,V _{GS} =0V, T _C =125℃	—	-	10	
正向栅极体漏电流 Forward Gate-body leakage current	I _{GSSF}	V _{DS} =0V, V _{GS} =+18V	-	-	250	nA
反向栅极体漏电流 Reverse Gate-body leakage current	I _{GSSR}	V _{DS} =0V, V _{GS} =-18V	-	-	-250	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	2.0	3.0	4.0	V
静态导通电阻 Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =15V , I _D =3.3A V _{GS} =18V , I _D =3.3A	-	750 550	1030 740	mΩ
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C _{iss}	V _{DS} =600V,V _{GS} =0V f=1.0MHz	-	116	-	pF
反向传输电容 Reverse transfer capacitance	C _{rss}		-	2.8	-	pF
输出电容 Output capacitance	C _{oss}		-	18	-	pF
开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	t _{d(on)}	V _{DD} =400V I _D =3.3A R _G =2.5Ω V _{GS} =18V / V _{GS} =-4V	-	3	-	ns
上升时间 Turn-On rise time	t _r		-	12	-	ns
延迟时间 Turn-Off delay time	t _{d(off)}		-	9	-	ns
下降时间 Turn-Off Fall time	t _f		-	18	-	ns
栅极电荷总量 Total Gate Charge	Q _g	V _{DS} =400V ,I _D =3.3 A, V _{GS} =18V /V _{GS} =-4V	-	7	-	nC
栅—源电荷 Gate-Source charge	Q _{gs}		-	1.5	-	nC
栅—漏电荷 Gate-Drain charge	Q _{gd}		-	4.3	-	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	I_{SD}		-	7	-	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	14	-	A
正向压降 Drain-Source Diode Forward	V_{SD}	$V_{GS}=0V, I_S=1.7A, T_j=25^{\circ}C$	-	4.3	5.2	V
反向恢复时间 Reverse recovery time	t_{rr}	$V_{DD}=400V$ $I_F=1.7A$ $dI_F/dt=100A/\mu s$ $T_j=25^{\circ}C$	-	48	-	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	52	-	nC

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	$R_{th(j-c)}$	3.28	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	$^{\circ}C/W$

注释:

1 Repetitive Rating: Pulse width limited by maximum junction temperature

2 EAS: $L=10mH$, $V_{DD}=100V$, $V_G=10V$, Starting $T_j=25^{\circ}C$, $R_G=25\Omega$

特性曲线 Characteristics Curve $T_j = 25^\circ\text{C}$, unless otherwise noted

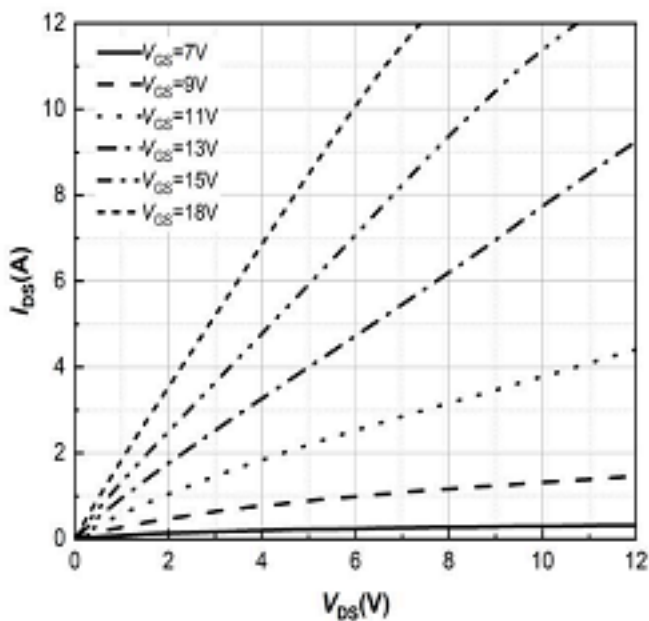


Figure 1. Output Characteristics
 $T_j = -40^\circ\text{C}$

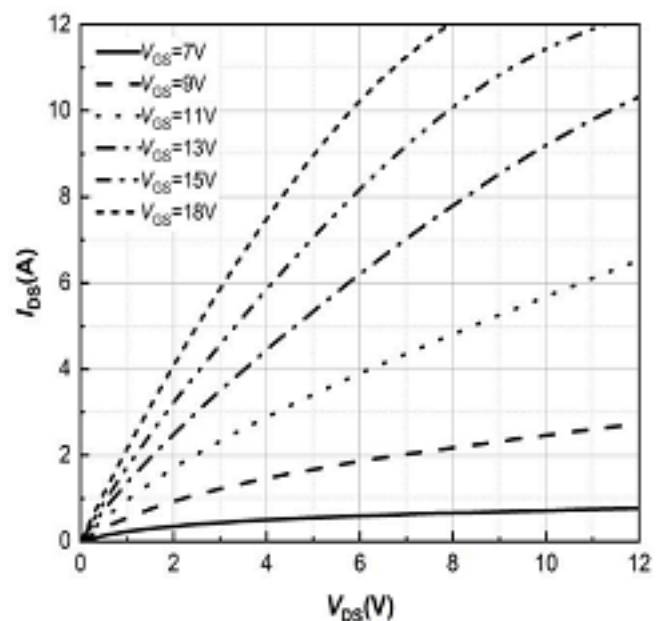


Figure 2. Output Characteristics
 $T_j = 25^\circ\text{C}$

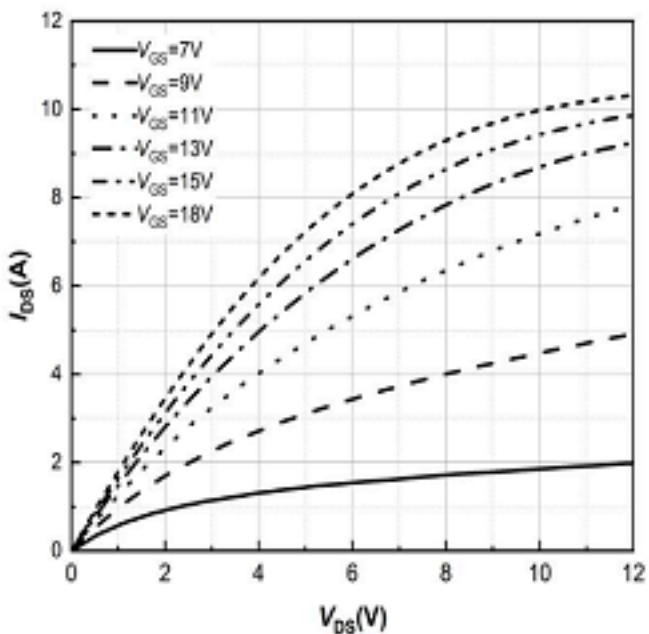


Figure 3. Output Characteristics
 $T_j = 175^\circ\text{C}$

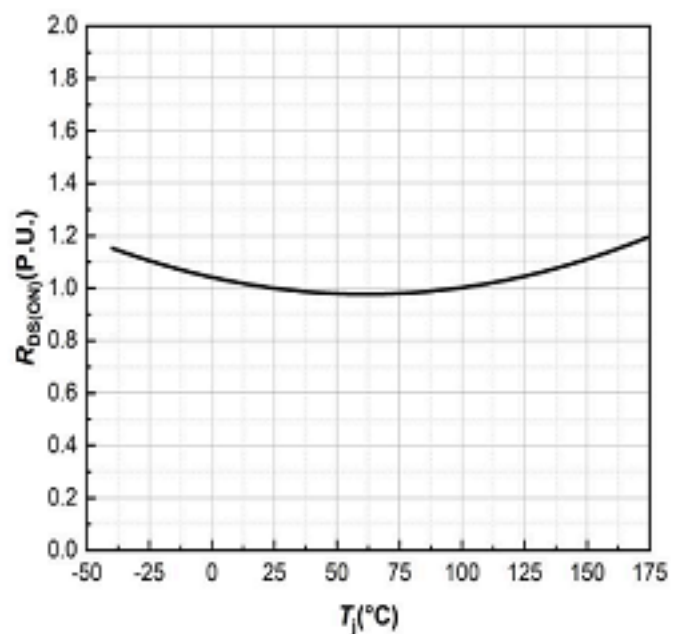


Figure 4. Normalized On-Resistance vs.
Temperature

特性曲线 Characteristics Curve $T_J = 25^\circ\text{C}$, unless otherwise noted

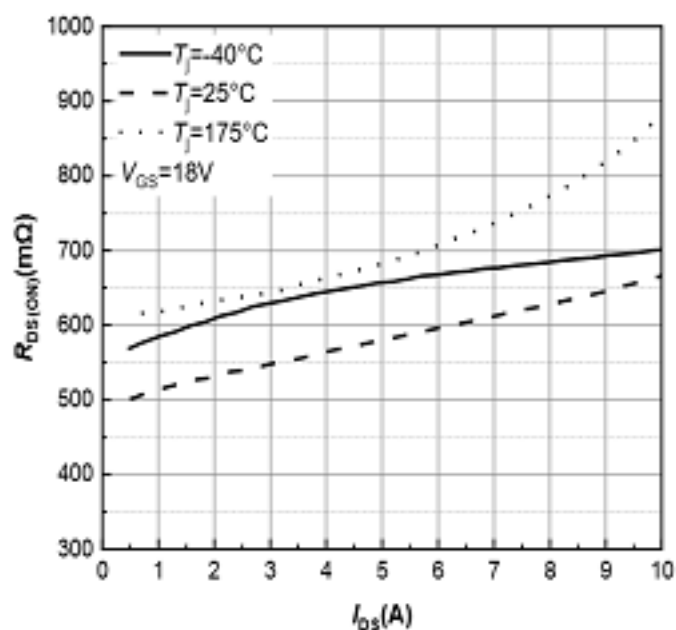


Figure 5. On-Resistance vs. Drain Current For Various Temperatures

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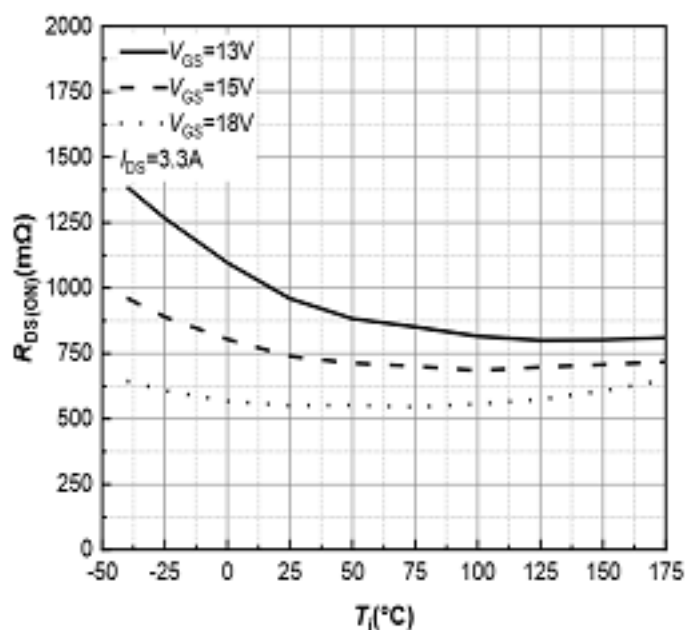


Figure 6. On-Resistance vs. Temperature For Various Gate Voltage

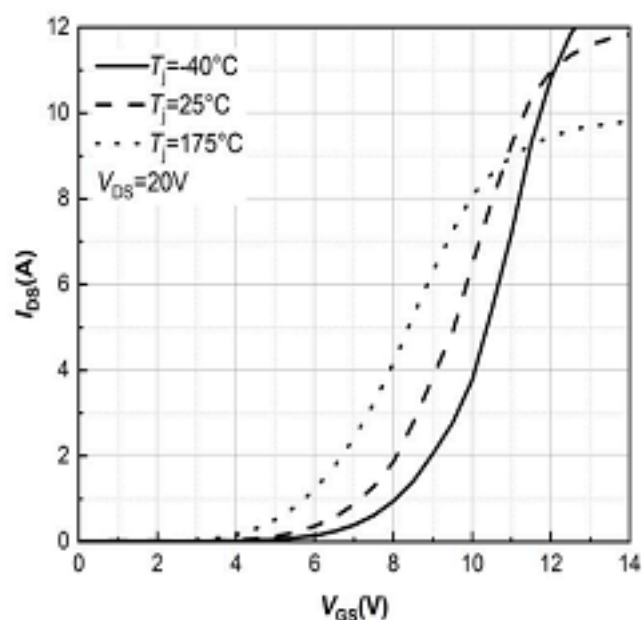


Figure 7. Transfer Characteristic for Various Junction Temperatures

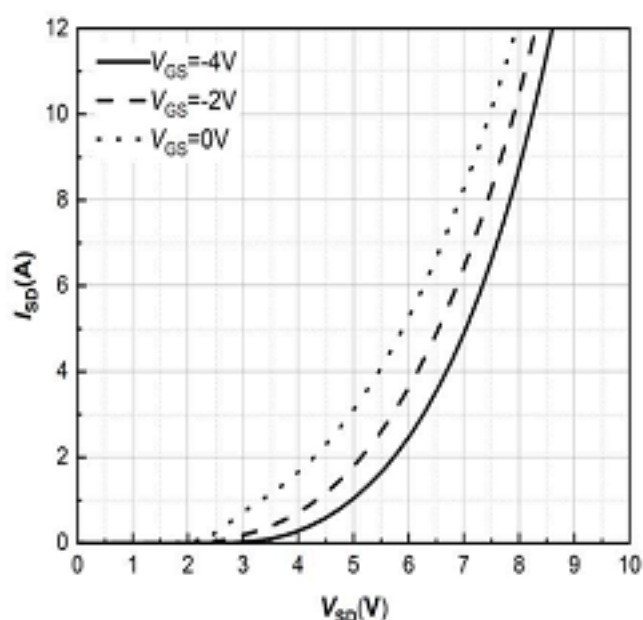


Figure 8. Body Diode Characteristic $T_J = -40^\circ\text{C}$

特性曲线 Characteristics Curve $T_J = 25^\circ\text{C}$, unless otherwise noted

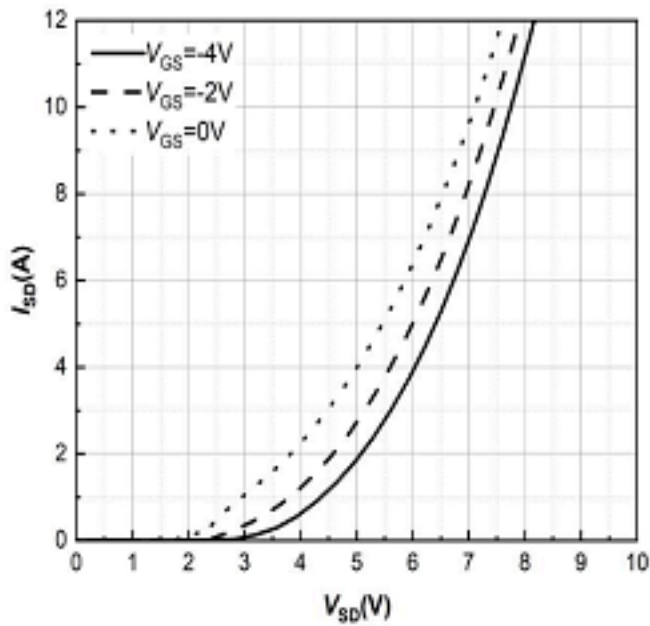


Figure 9. Body Diode Characteristic
 $T_J = 25^\circ\text{C}$

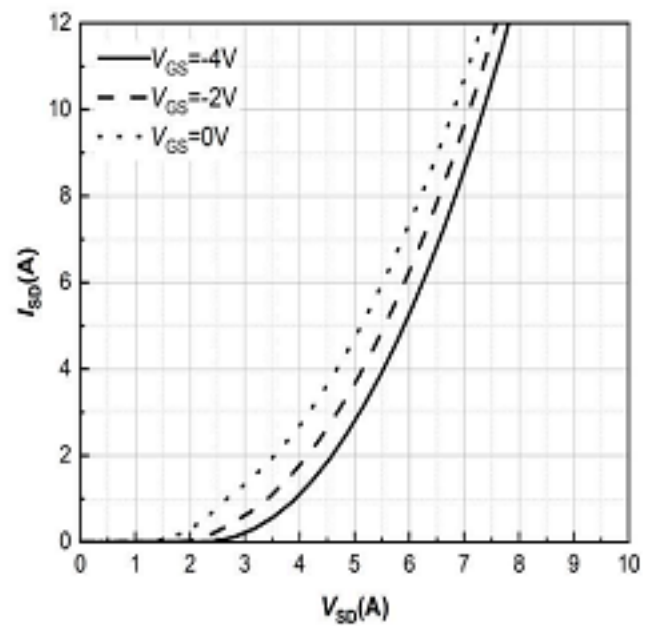


Figure 10. Body Diode Characteristic
 $T_J = 175^\circ\text{C}$

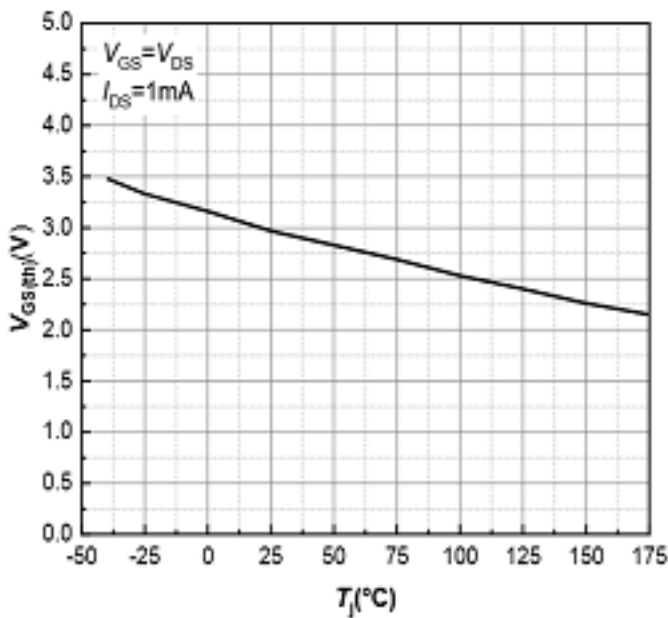


Figure 11. Threshold Voltage vs.
Temperature

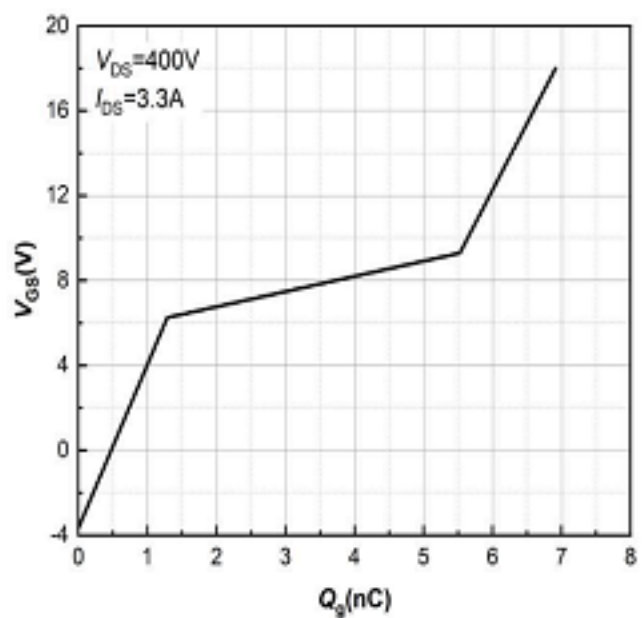


Figure 12. Gate Charge Characteristics

特性曲线 Characteristics Curve $T_J = 25^\circ\text{C}$, unless otherwise noted

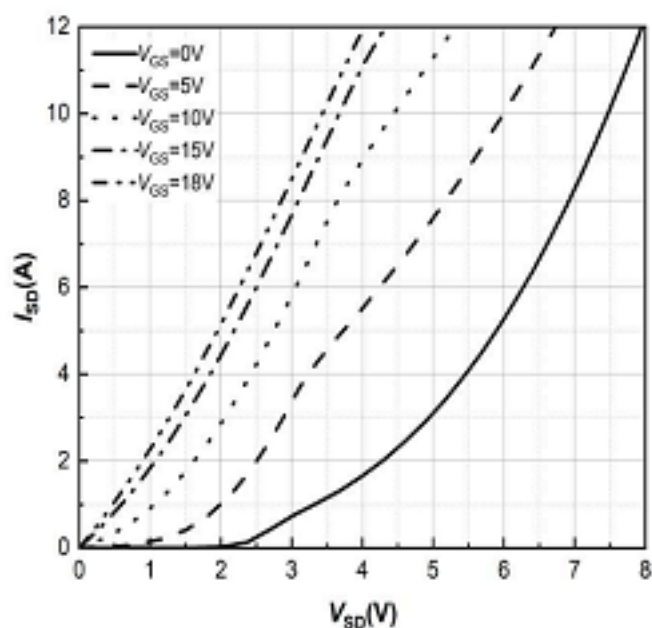


Figure 13. 3rd Quadrant Characteristic
 $T_J = -40^\circ\text{C}$

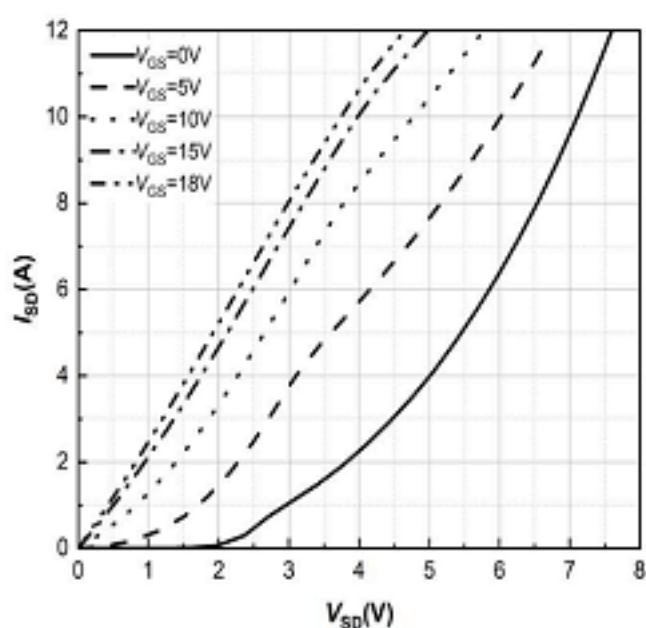


Figure 14. 3rd Quadrant Characteristic
 $T_J = 25^\circ\text{C}$

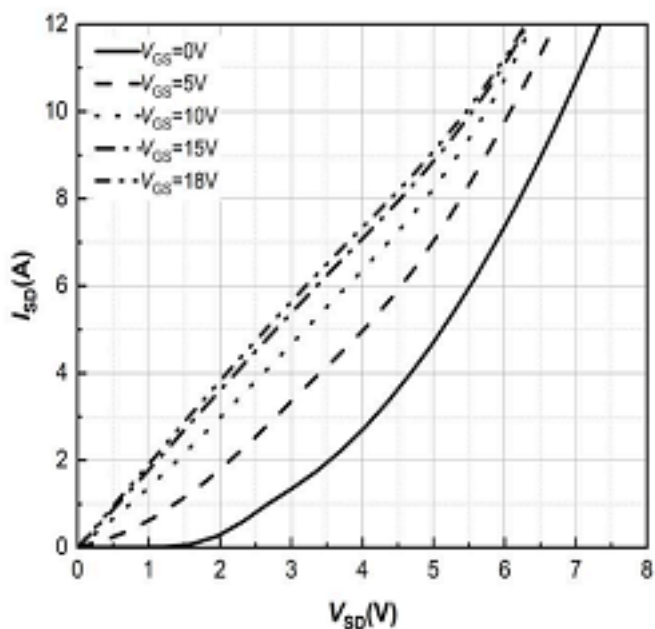


Figure 15. 3rd Quadrant Characteristic
 $T_J = 175^\circ\text{C}$

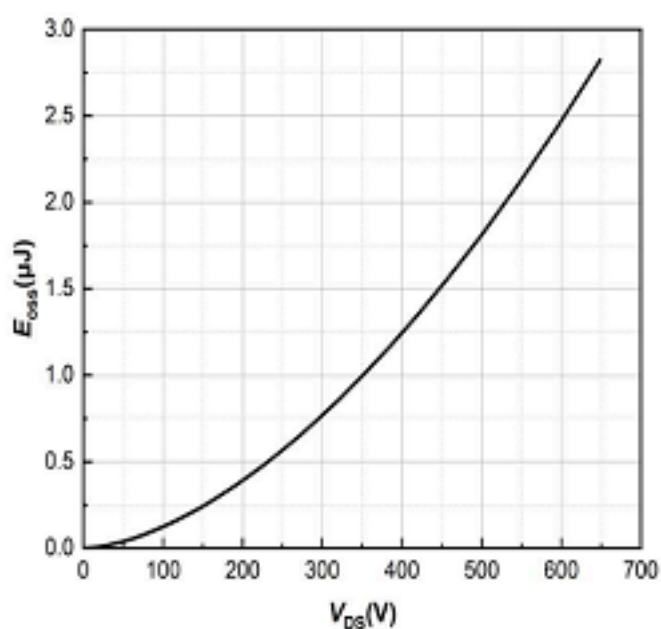


Figure 16. Output Capacitor Stored Energy

特性曲线 Characteristics Curve $T_J = 25^\circ\text{C}$, unless otherwise noted

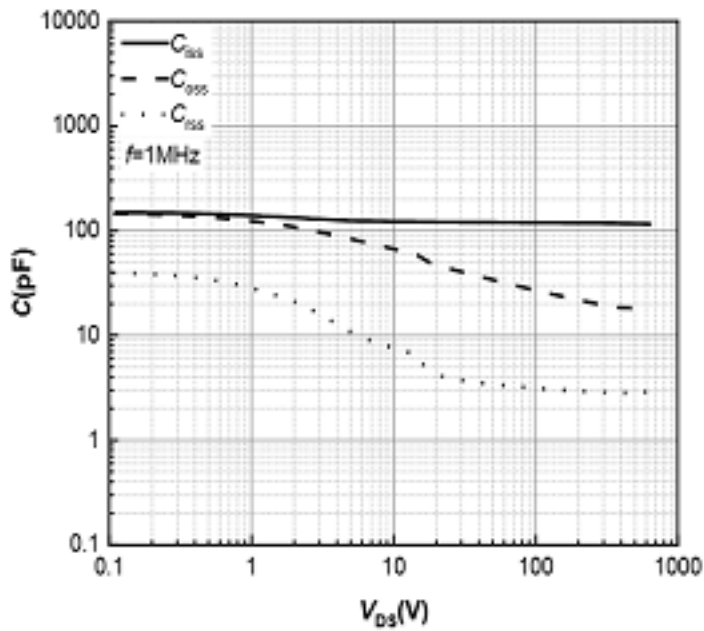


Figure 17. Capacitances vs. Drain-Source

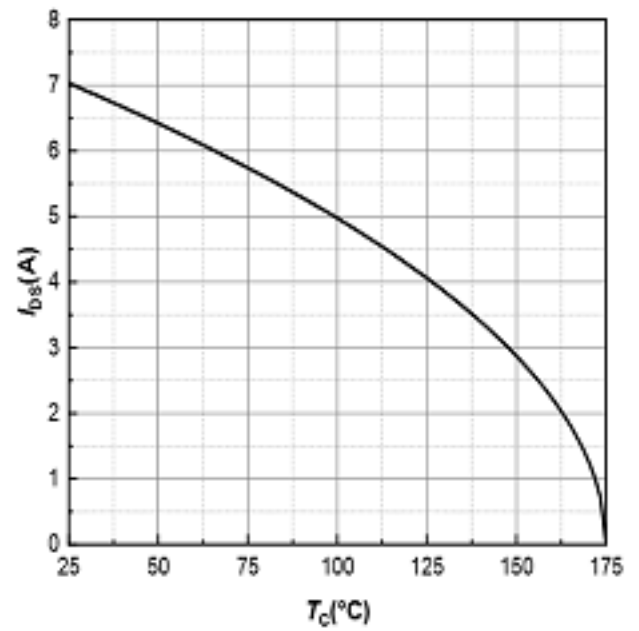


Figure 18. Continuous Drain Current Derating vs. Case Temperature

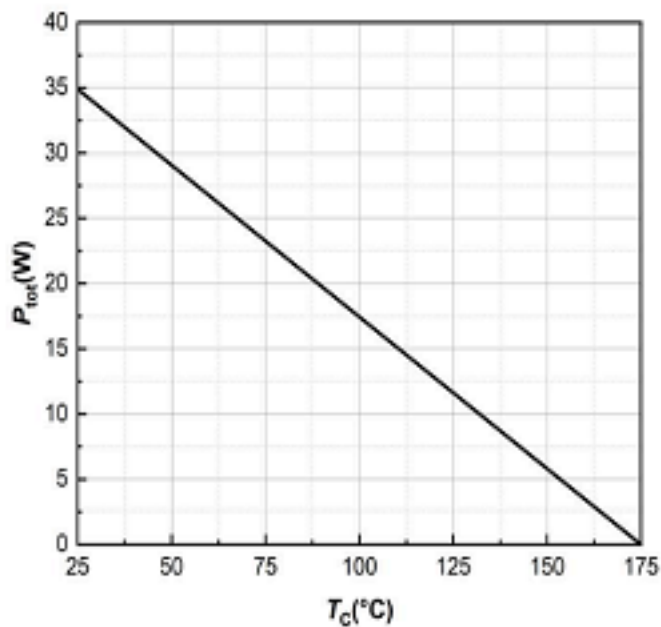


Figure 19. Maximum Power Dissipation Derating vs. Case Temperature

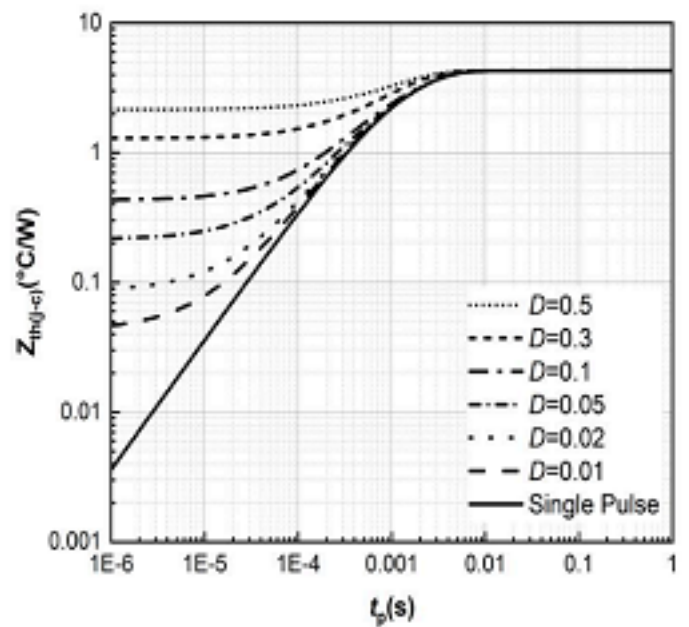


Figure 20. Transient Thermal Impedance

特性曲线 Characteristics Curve $T_J = 25^\circ\text{C}$, unless otherwise noted

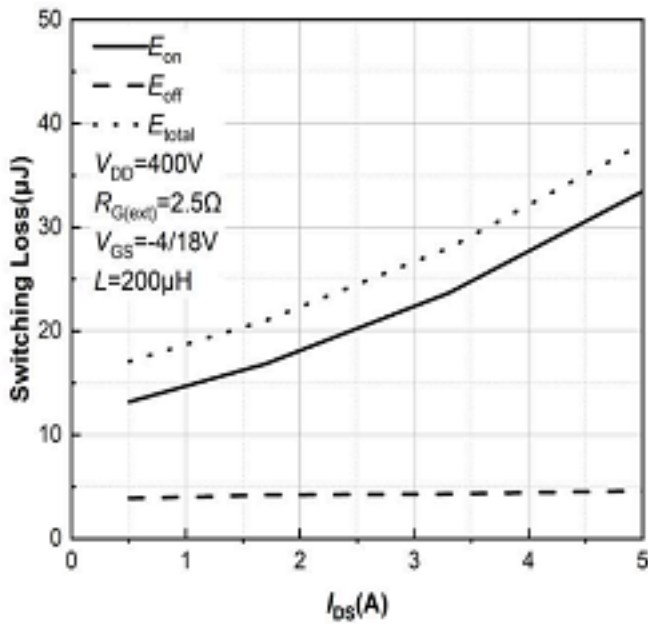


Figure 21. Clamped Inductive Switching Energy vs. Drain Current
 $T_J = 25^\circ\text{C}$

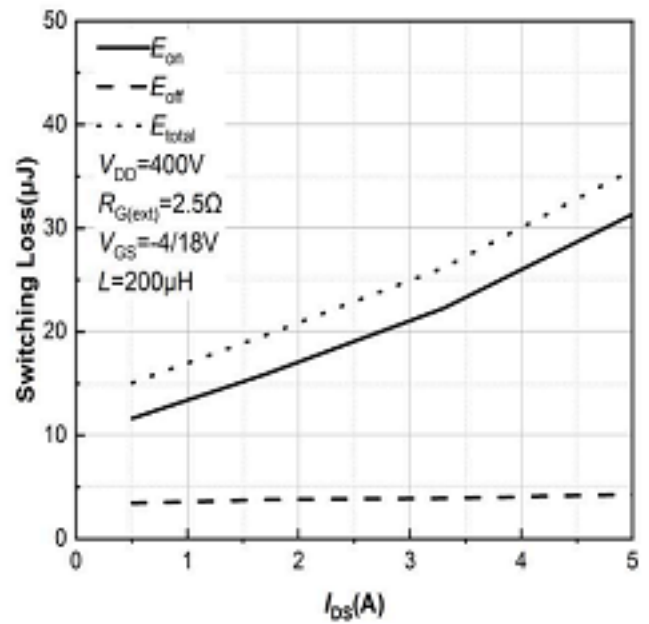


Figure 22. Clamped Inductive Switching Energy vs. Drain Current
 $T_J = 175^\circ\text{C}$

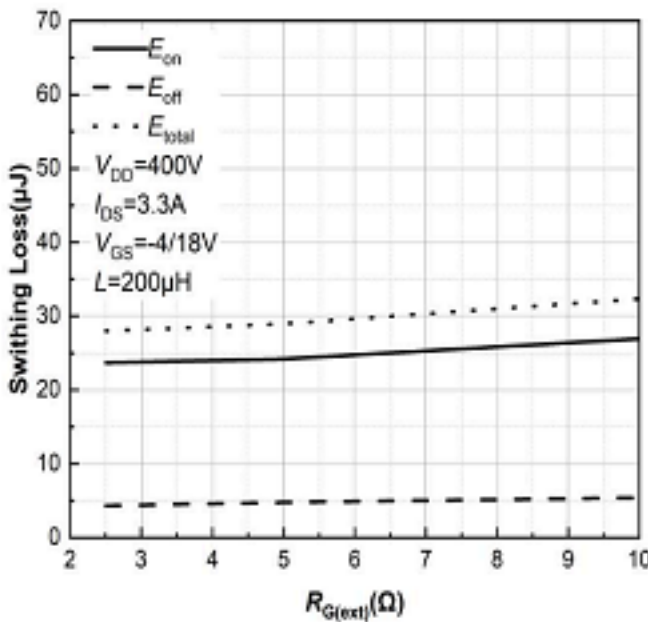


Figure 23. Clamped Inductive Switching Energy vs. $R_{G(\text{ext})}$
 $T_J = 25^\circ\text{C}$

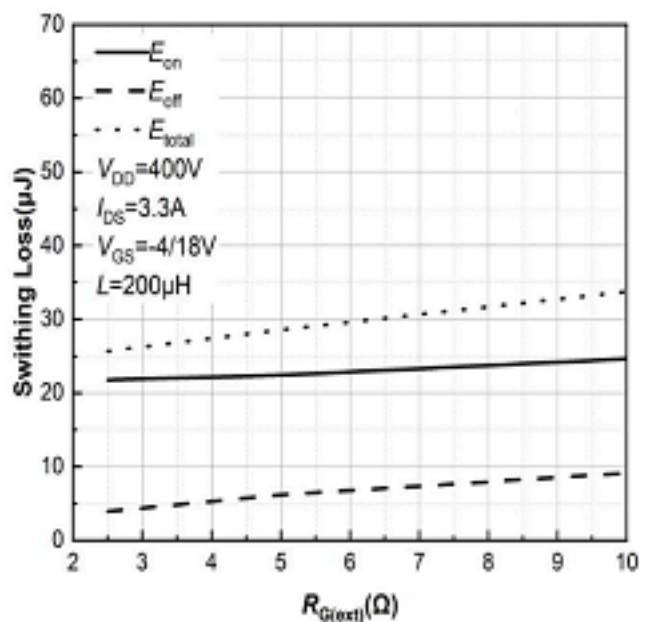


Figure 24. Clamped Inductive Switching Energy vs. $R_{G(\text{ext})}$
 $T_J = 175^\circ\text{C}$

特性曲线 Characteristics Curve $T_j = 25^\circ\text{C}$, unless otherwise noted

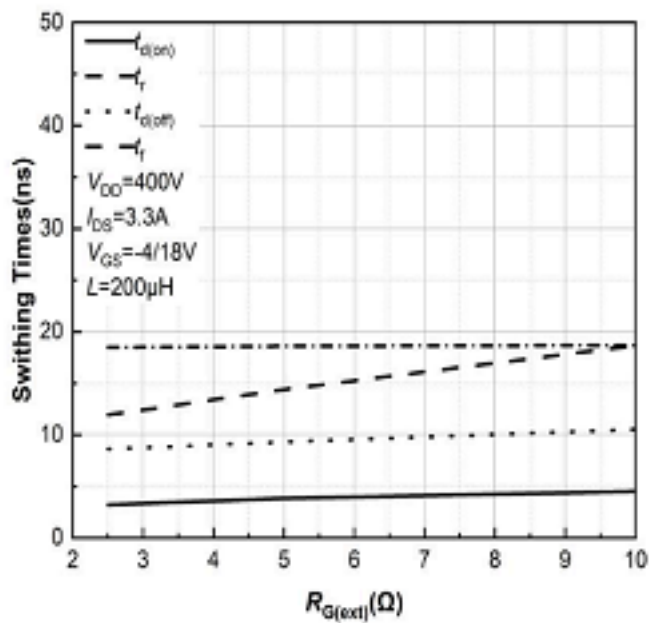


Figure 25. Switching Times vs. $R_{G(ext)}$
 $T_j = 25^\circ\text{C}$

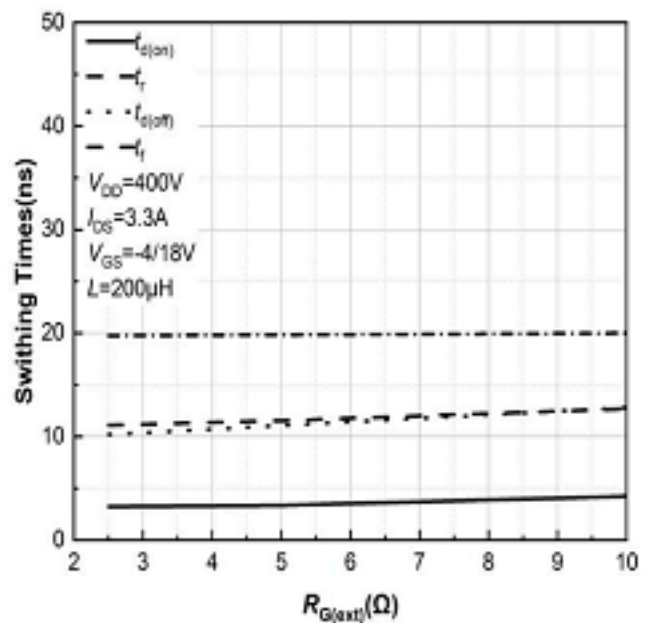


Figure 26. Switching Times vs. $R_{G(ext)}$
 $T_j = 175^\circ\text{C}$

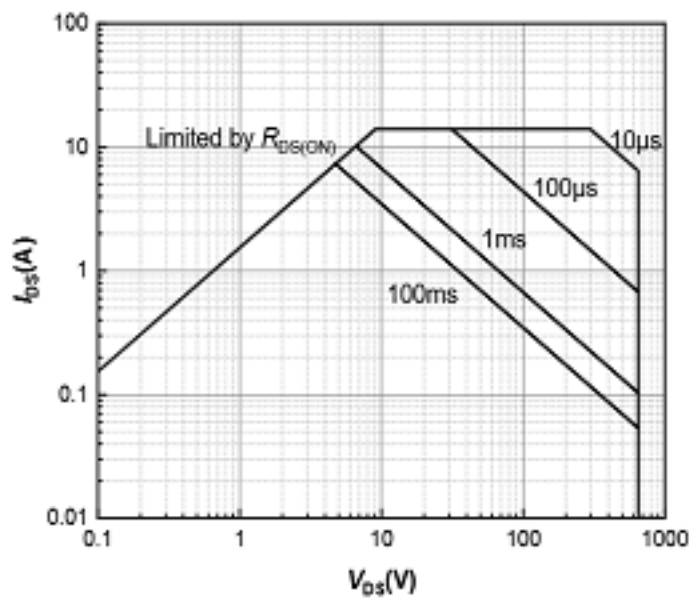
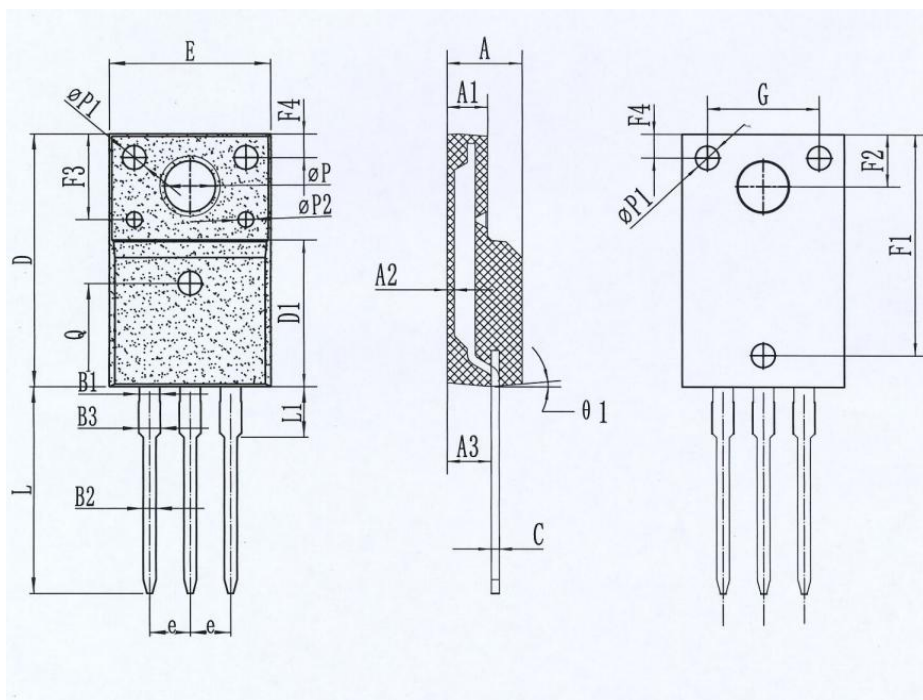


Figure 27. Safe Operating Area

成品外观尺寸/ Package Information

unit : mm

TO-220F



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.60	4.70	4.80
A1	2.44	2.54	2.64
A2	0.38	0.43	0.48
A3	2.66	2.76	2.86
B1	1.24	1.29	1.34
B2	0.75	0.80	0.85
B3	1.28	1.36	1.44
C	0.45	0.50	0.55
D	15.67	15.87	16.07
D1	9.07	9.17	9.27
e	2.54BSC		
E	10.06	10.16	10.26
E1	9.92	10.02	10.12
E2	9.36	9.46	9.56
F1	13.80	13.90	14.00
F2	3.20	3.30	3.40
F3	5.30	5.40	5.50
F4	1.40	1.50	1.60
G	6.90	7.00	7.10
K	0.65	0.70	0.75
L	12.76	12.96	13.16
L1	2.73	2.93	3.13
Q	6.47REF		
ϕP	3.00	3.18	3.38
$\phi P1$	1.40	1.50	1.60
$\phi P2$	0.95	1.00	1.05
$\theta 1$	3°	5°	7°