

/ Revised record

版本	修订日期	有修订的页码	修订涉及的内容	拟制	审核
A	19-05-20		首次制定	庞隆基	
B	2019-6-4	1	在特征栏增加无卤信息	蓝月葵	刘晓荣
C	2021-3-14	ALL	更换 ZM18503PA 芯片	庞隆基	陈逸晞

/ Descriptions

P 沟道 TO-252 塑封封装场效应管。

P-CHANNEL MOSFET in a TO-252 Plastic Package.

/ Features

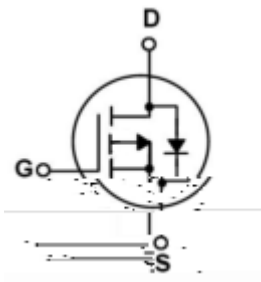
$R_{DS(on)}$ 小, 大电流输出能力。无卤产品。

Low $R_{DS(on)}$, High Current Capability. Halogen-free Product.

/ Applications

交流负载开关, 蓄电池充电/放电保护。

AC-in load switch, Battery protection charge/discharge.

/ Equivalent Circuit**/ Pinning**

PIN1 : G

PIN 2 : D

PIN 3 : S

PIN 4 : D

/ h_{FE} Classifications & Marking

见印章说明。

See Marking Instructions.

/ Absolute Maximum Ratings(Ta=25)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	-30	V
Drain Current		$I_D(T_c=25^{\circ}\text{C})$	-40	A
Drain Current - Pulsed		I_{DM}	-140	A
Gate-Source Voltage		V_{GS}	± 20	V
Avalanche Current		I_{AS}	22	A
Avalanche energy L=0.5mH		E_{AS}	662.7	mJ
Power Dissipation		$P_D(T_c=25^{\circ}\text{C})$	44	W
		$P_D(T_c=100^{\circ}\text{C})$	17	W
Junction and Storage Temperature Range		T_j, T_{stg}	-55~150	$^{\circ}\text{C}$
Maximum Junction-to-Ambient	$t \leq 10\text{s}$	$R_{\theta JA}$	11	$^{\circ}\text{C/W}$
Maximum Junction-to-Ambient	Steady-State		29	
Maximum Junction-to-Case	Steady-State	$R_{\theta JC}$	2.8	

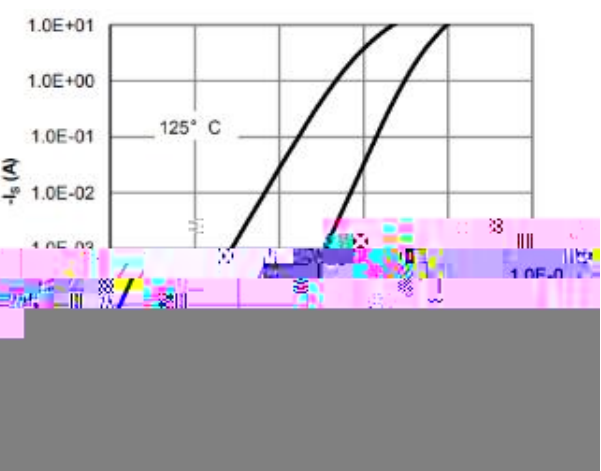
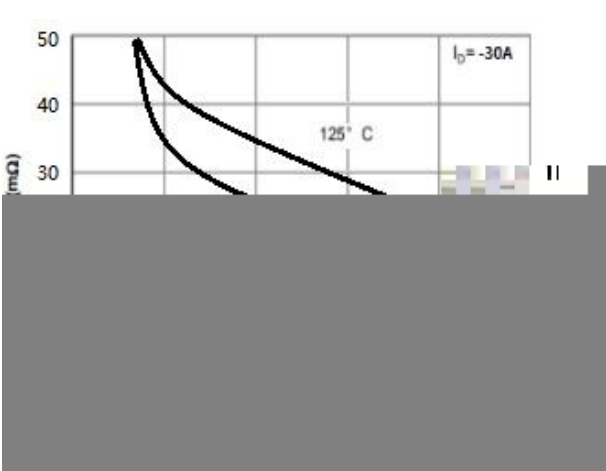
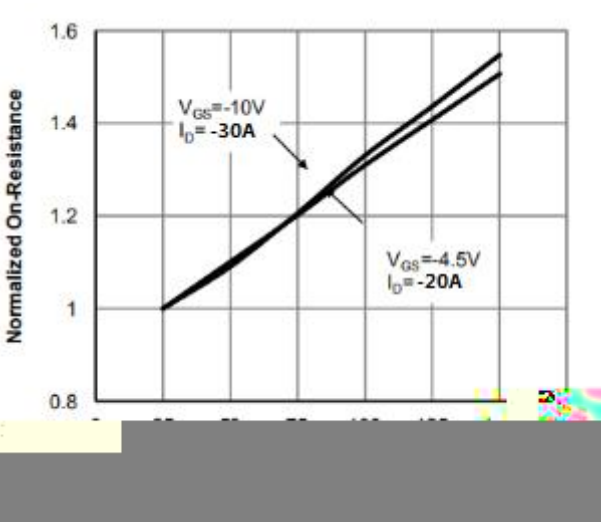
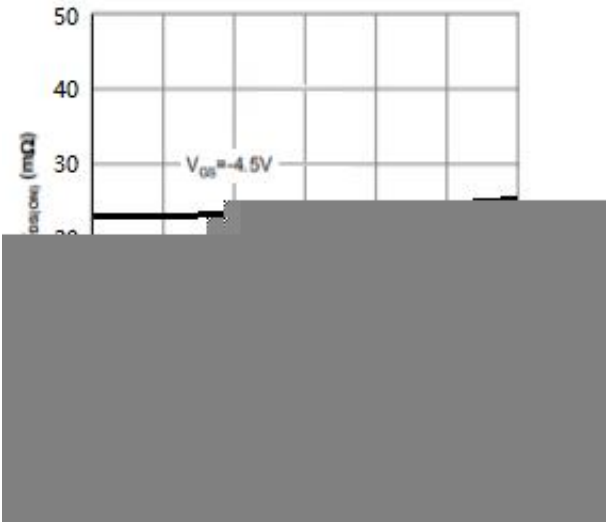
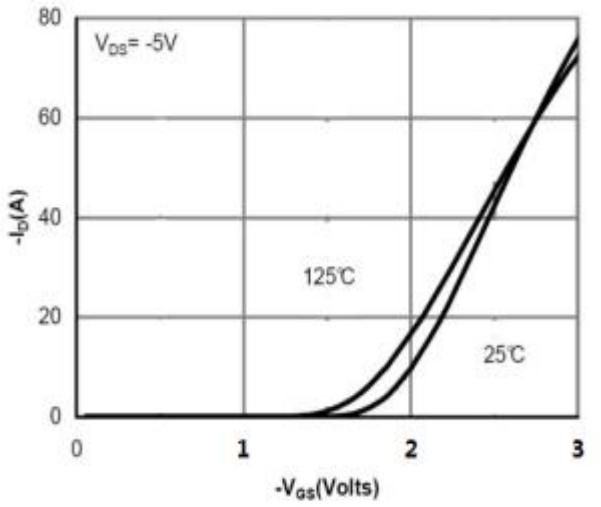
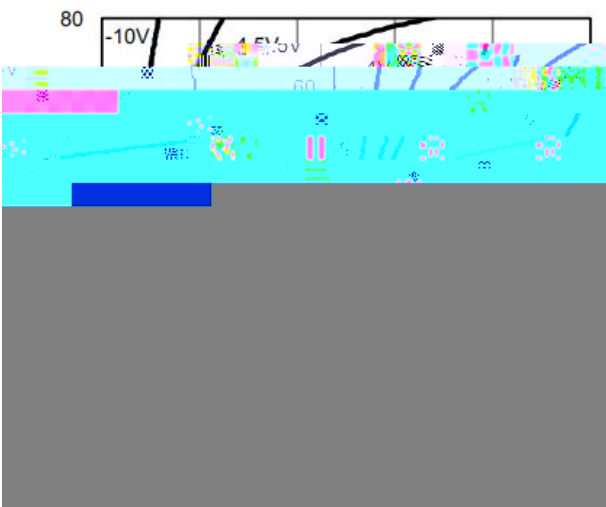
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}$	$I_D=-250\mu\text{A}$	-30	-36		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30\text{V}$	$V_{GS}=0\text{V}$			-1.0	μA
		$V_{DS}=-30\text{V}$	$V_{GS}=0\text{V}$ $T_j=55^{\circ}\text{C}$			-5.0	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 20\text{V}$	$V_{DS}=0\text{V}$			± 0.1	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$	$I_D=250\mu\text{A}$	-1	-1.6	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)1}$	$V_{GS}=-10\text{V}$	$I_D=-30\text{A}$		13	16	m Ω
	$R_{DS(on)2}$	$V_{GS}=-4.5\text{V}$	$I_D=-20\text{A}$		24	28	m Ω
Diode Forward Voltage	V_{SD}	$I_S=-1\text{A}$	$V_{GS}=0\text{V}$		-0.9	-1.2	V

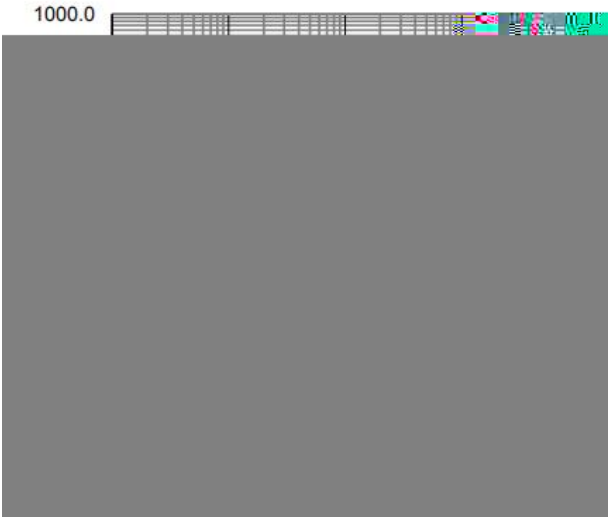
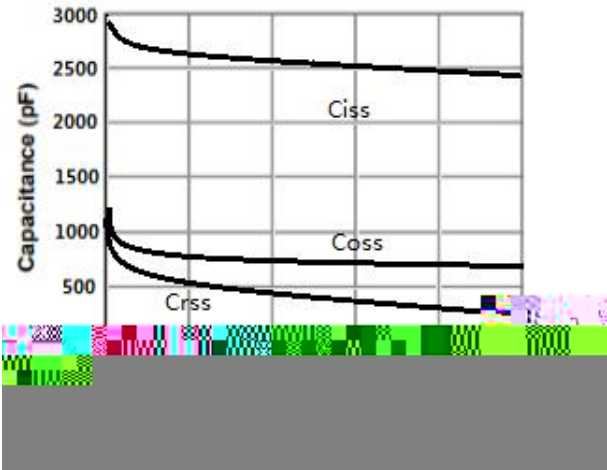
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Capacitance	C_{iss}	$V_{DS}=-0V$ $V_{GS}=0V$ $f=1.0MHz$		2530		pF
Output Capacitance	C_{oss}			790		
Reverse Transfer Capacitance	C_{rss}			450		
Gate resistance	R_g	$V_{GS}=0V$ $V_{DS}=0V$ $f=1MHz$		8		Ω
Total Gate Charge	$Q_g(10V)$	$V_{GS}=-10V$ $V_{DS}=-15V$ $I_D=-20A$		50	70	nC
Total Gate Charge	$Q_g(4.5V)$			25	35	
Gate Source Charge	Q_{gs}			9		
Gate Drain Charge	Q_{gd}			12		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-10V$ $V_{DS}=-15V$ $R_L=0.75\Omega$ $R_{GEN}=3\Omega$		12.5		ns
Turn-On Rise Time	t_r			18		
Turn-Off Delay Time	$t_{d(off)}$			125		
Turn-Off Fall Time	t_f			66		

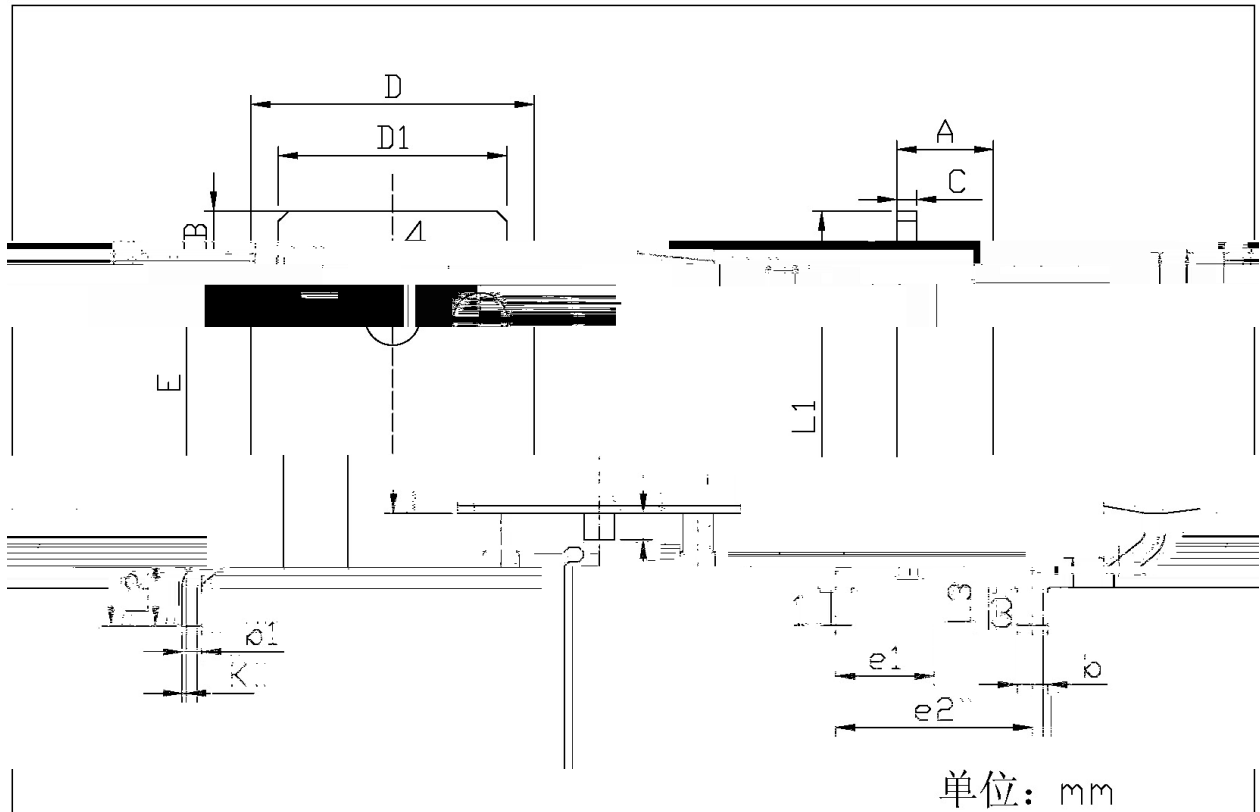
/ Electrical Characteristic Curve



/ Electrical Characteristic Curve

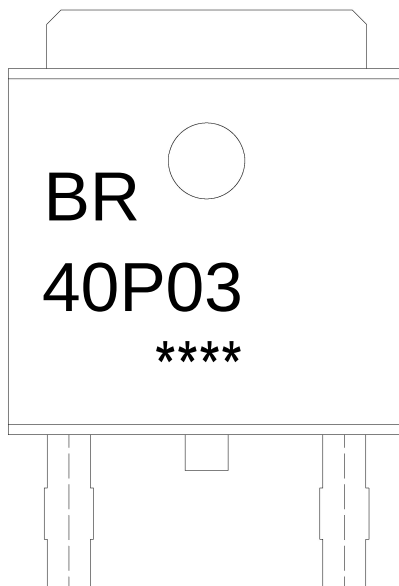


/ Package Dimensions



Dimensions	Symbol	Dimensions in Millimeters		Symbol	Dimensions in Millimeters
Min		Min	Max	Min	
2.40	B	6.95	6.25	2.28	A
0.50	e1	0.70	4.43	4.73	b
0.45	L1	0.55	9.45	9.95	b1
0.45	L2	0.55	1.25	1.75	C
6.25	L3	6.25	0.60	0.90	D
D1		5.10	5.50	K	0.00
					0.10

/ Marking Instructions



BR

40P03

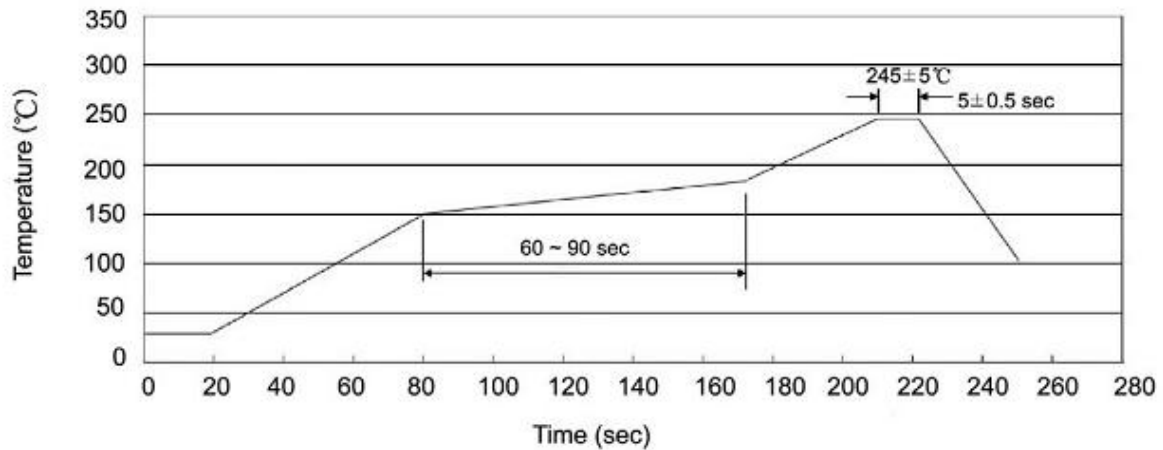
Note:

BR: Company Code

40P03: Product Type Code.

****: Lot No. Code, code change with Lot No.

() / Temperature Profile for IR Reflow Soldering(Pb-Free)



Note:

- | | | | | | |
|---|-----|-----|----|---------|---|
| 1 | 150 | 180 | 60 | 90sec; | 1.Preheating:150~180 , Time:60~90sec. |
| 2 | 245 | 5 | 5 | 0.5sec; | 2.Peak Temp.:245 5 , Duration:5 0.5sec. |
| 3 | | 2 | 10 | /sec. | 3. Cooling Speed: 2~10 /sec. |

/ Resistance to Soldering Heat Test Conditions

260 5 10 1 sec. Temp.:260±5°C Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
TO-252	2,500	2	5,000	5	25,000	13" ×16	360×360×50	385×257×392

/ TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	Units/Tube 只/套管	Tubes/Inner Box 套管/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Tube 套管	Inner Box 盒	Outer Box 箱
TO-251/252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180

/ Notices