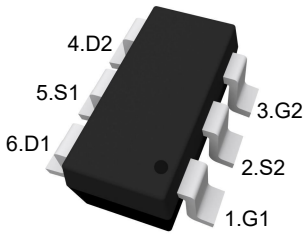
PJM4603CSG

N and P-Channel Complementary Power MOSFET

Features

- **N-Channel**
  V_{DS}=20V,I_D=3A
  $R_{DS(on)}$<30mΩ@V_{GS}=4.5V
  $R_{DS(on)}$<55mΩ@V_{GS}=2.5V
- **P-Channel**
  V_{DS}=-20V,I_D=-3A
  $R_{DS(on)}$<110mΩ@V_{GS}=-4.5V
  $R_{DS(on)}$<140mΩ@V_{GS}=-2.5V
- High Power and Current handing capability

SOT-23-6

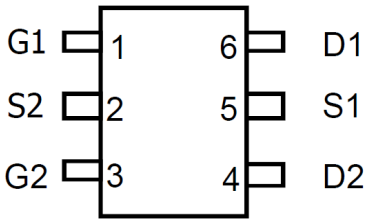


Marking Code:4603

Applications

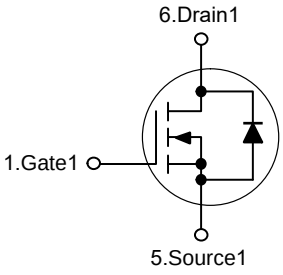
- Battery protection
- Load switch
- Power management

Pin Assignment

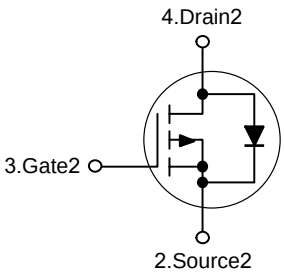


Top View

Schematic Diagram



N-Channel



P-Channel

Absolute Maximum Ratings

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	20	-20	V
Gate-Source Voltage	V_{GS}	±12		V
Drain Current-Continuous	I_D	3	-3	A
Drain Current-Pulsed Note1	I_{DM}	10	-10	A
Maximum Power Dissipation	P_D	0.8		W
Junction Temperature	T_J	150		℃
Storage Temperature Range	T_{STG}	-55 to +150		℃

Thermal Characteristics

Thermal Resistance,Junction-to-Ambient Note2	$R_{\theta JA}$	156	℃/W

N-Channel

Electrical Characteristics

(T_a=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250μA	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage Note3	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.4	0.65	1	V
Drain-Source On-Resistance Note3	$R_{DS(on)}$	V_{GS}=4.5V,I_D=3A	--	23	30	mΩ
		V_{GS}=2.5V,I_D=3A	--	30	55	mΩ
Forward Transconductance Note3	g_{FS}	V_{DS}=5V,I_D=1A	--	5	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V,f=1MHz	--	260	--	pF
Output Capacitance	C_{oss}		--	48	--	pF
Reverse Transfer Capacitance	C_{rss}		--	27	--	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V,R_L=3.3Ω V_{GS}=4.5V,R_{GEN}=6Ω	--	2.5	--	nS
Turn-on Rise Time	t_r		--	3.2	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	21	--	nS
Turn-off Fall Time	t_f		--	3	--	nS
Total Gate Charge	Q_g	V_{DS}=10V,I_D=3A, V_{GS}=4.5V	--	2.9	--	nC
Gate-Source Charge	Q_{gs}		--	0.4	--	nC
Gate-Drain Charge	Q_{gd}		--	0.6	--	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage Note3	V_{SD}	V_{GS}=0V,I_S=3A	--	--	1.2	V
Diode Forward Current Note2	I_S		--	--	3	A

P-Channel

Electrical Characteristics

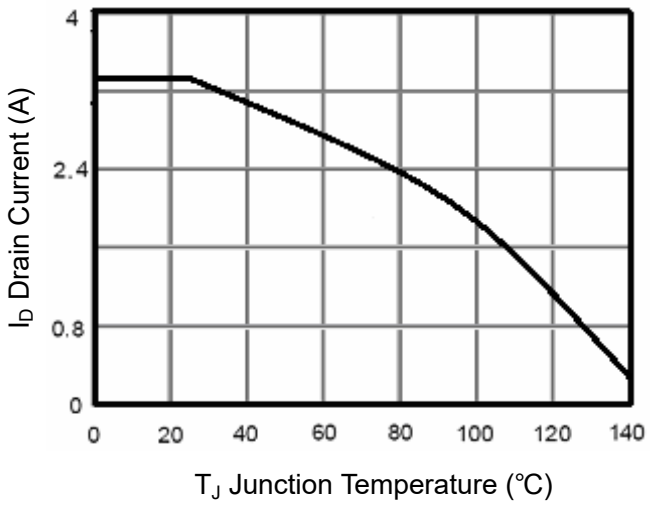
(T_a=25°C unless otherwise specified)

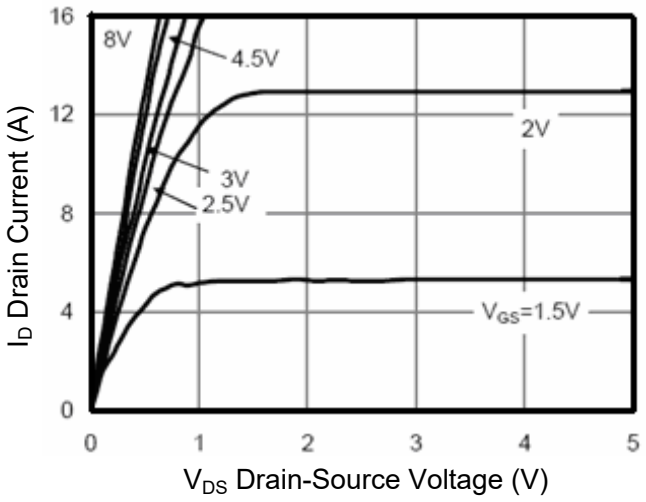
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$-V_{(BR)DSS}$	V_{GS}=0V,I_D=-250μA	20	--	--	V
Zero Gate Voltage Drain Current	$-I_{DSS}$	V_{DS}=-20V,V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage Note3	$-V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	0.4	0.7	1	V
Drain-Source On-Resistance Note3	$R_{DS(on)}$	V_{GS}=-4.5V,I_D=-3A	--	78	110	mΩ
		V_{GS}=-2.5V,I_D=-2A	--	102	140	mΩ
Forward Transconductance Note3	g_{FS}	V_{DS}=-5V,I_D=-2A	--	5	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V,f=1MHz	--	405	--	pF
Output Capacitance	C_{oss}		--	75	--	pF
Reverse Transfer Capacitance	C_{rss}		--	55	--	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V,I_D=-1A, V_{GS}=-4.5V,R_{GEN}=10Ω	--	11	--	nS
Turn-on Rise Time	t_r		--	35	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	30	--	nS
Turn-off Fall Time	t_f		--	10	--	nS
Total Gate Charge	Q_g	V_{DS}=-10V,I_D=-3A, V_{GS}=-2.5V	--	3.3	--	nC
Gate-Source Charge	Q_{gs}		--	0.7	--	nC
Gate-Drain Charge	Q_{gd}		--	1.3	--	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage Note3	$-V_{SD}$	V_{GS}=0V,I_S=-3A	--	--	1.2	V
Diode Forward Current Note2	$-I_S$		--	--	3	A

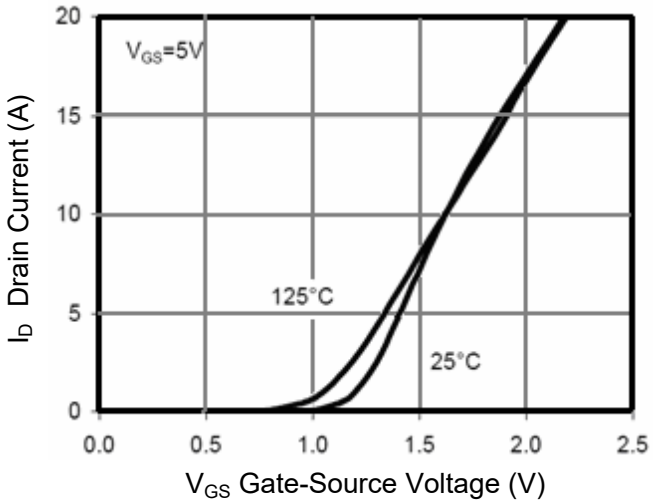
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse width≤300μs, duty cycle≤2%.

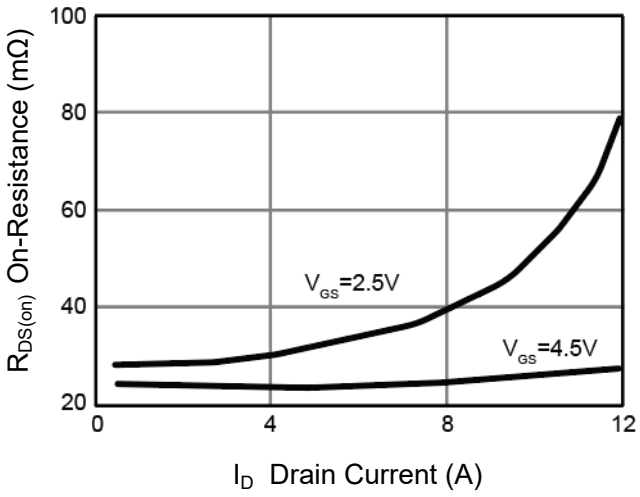
N-Channel

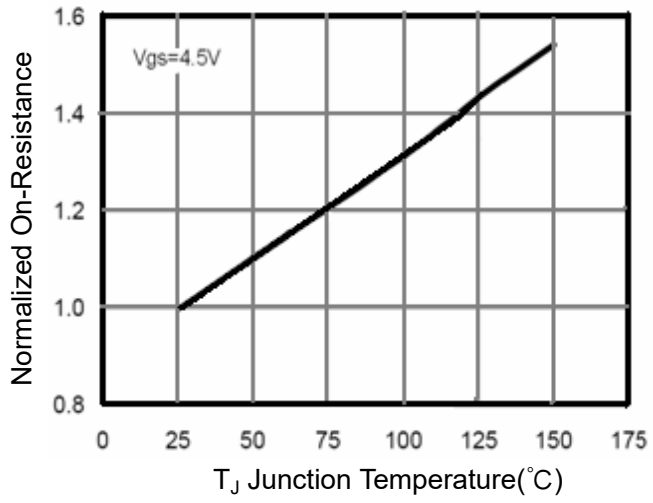
Electrical Characteristics Curves

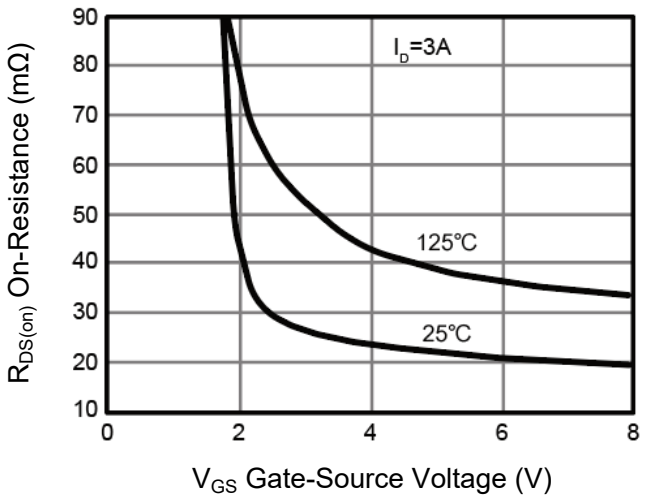


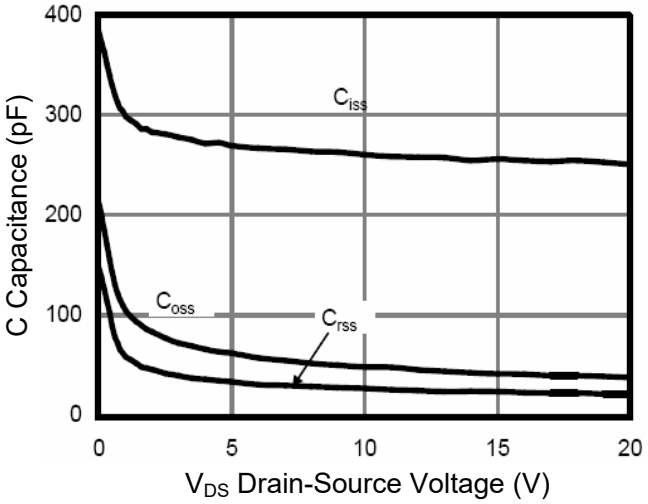


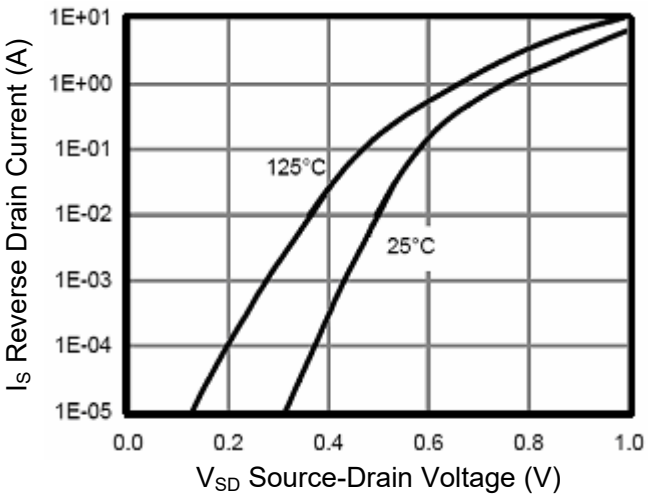


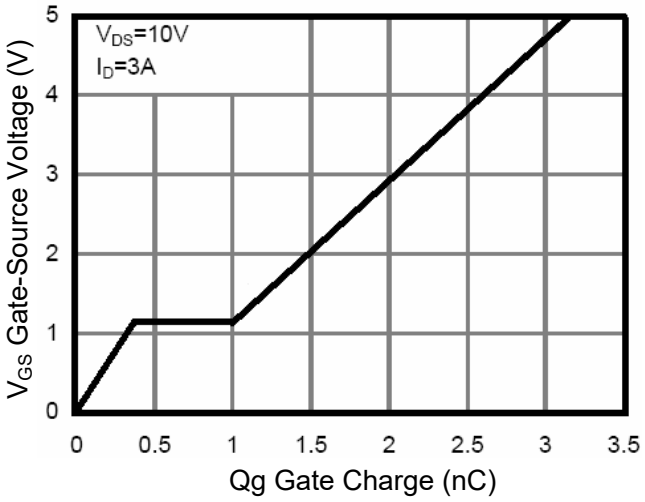






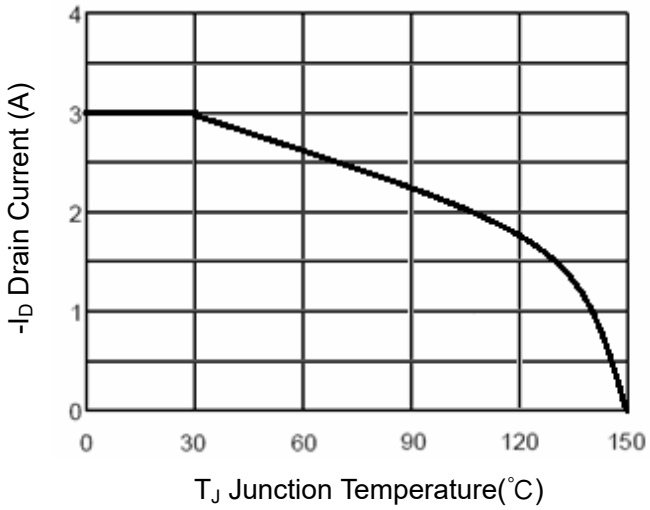

C Capacitance (pF)
400
300
200
100
0
C_{iss}
C_{oss}
C_{rss}
0
5
10
15
20
V_{DS} Drain-Source Voltage (V)

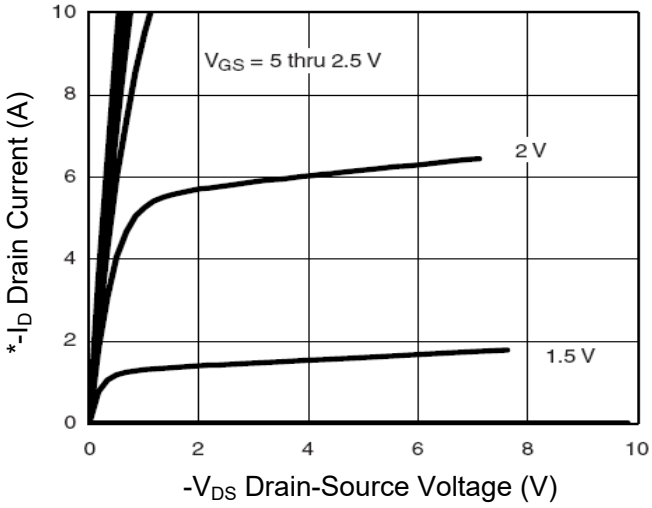

I_S Reverse Drain Current (A)
1E+01
1E+00
1E-01
1E-02
1E-03
1E-04
1E-05
125°C
25°C
0.0
0.2
0.4
0.6
0.8
1.0
V_{SD} Source-Drain Voltage (V)

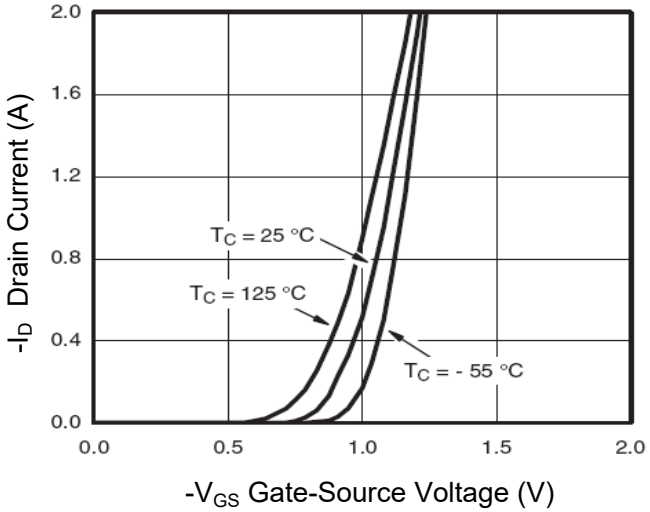

V_{GS} Gate-Source Voltage (V)
5
4
3
2
1
0
V_{DS}=10V
I_D=3A
0
0.5
1
1.5
2
2.5
3
3.5
Qg Gate Charge (nC)

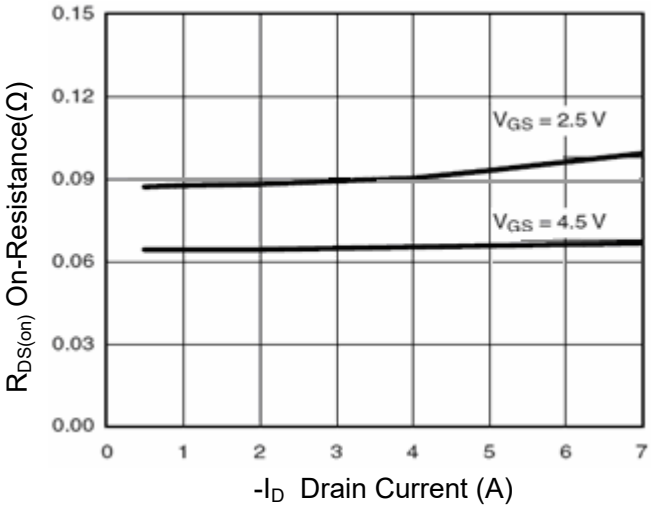
P-Channel

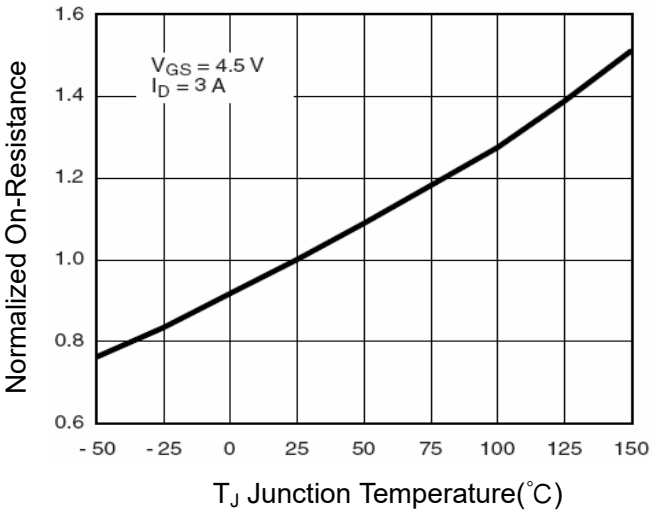
Electrical Characteristics Curves

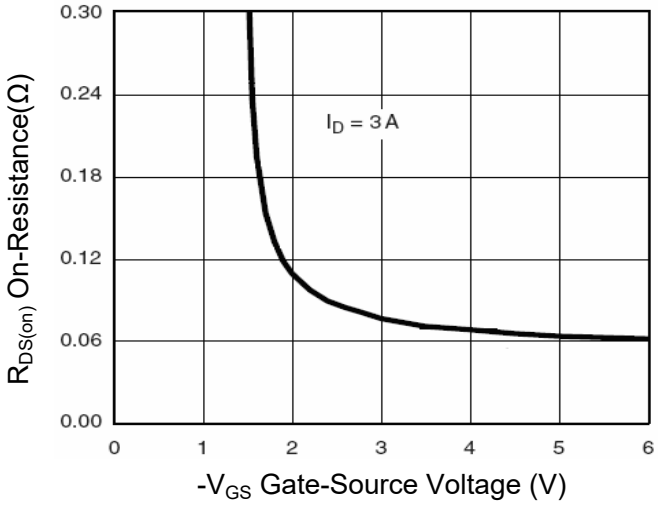


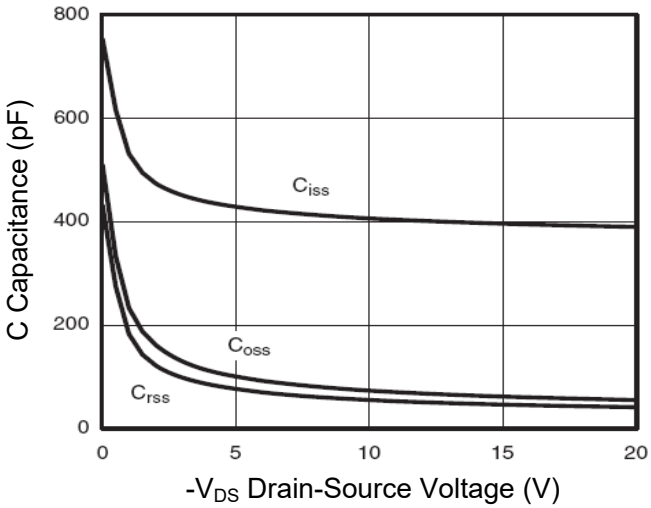


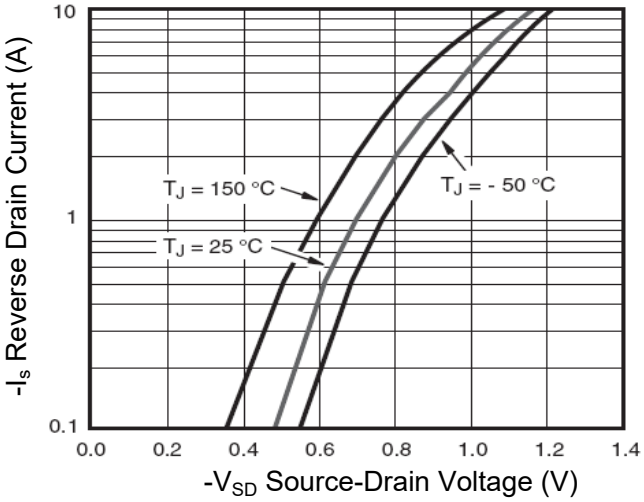


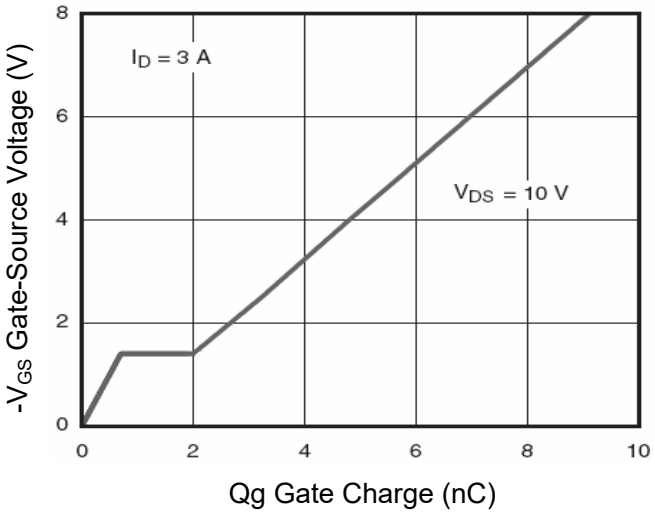







800
600
400
200
0
C Capacitance (pF)
Ciss
Coss
Crss
0
5
10
15
20
-VDS Drain-Source Voltage (V)

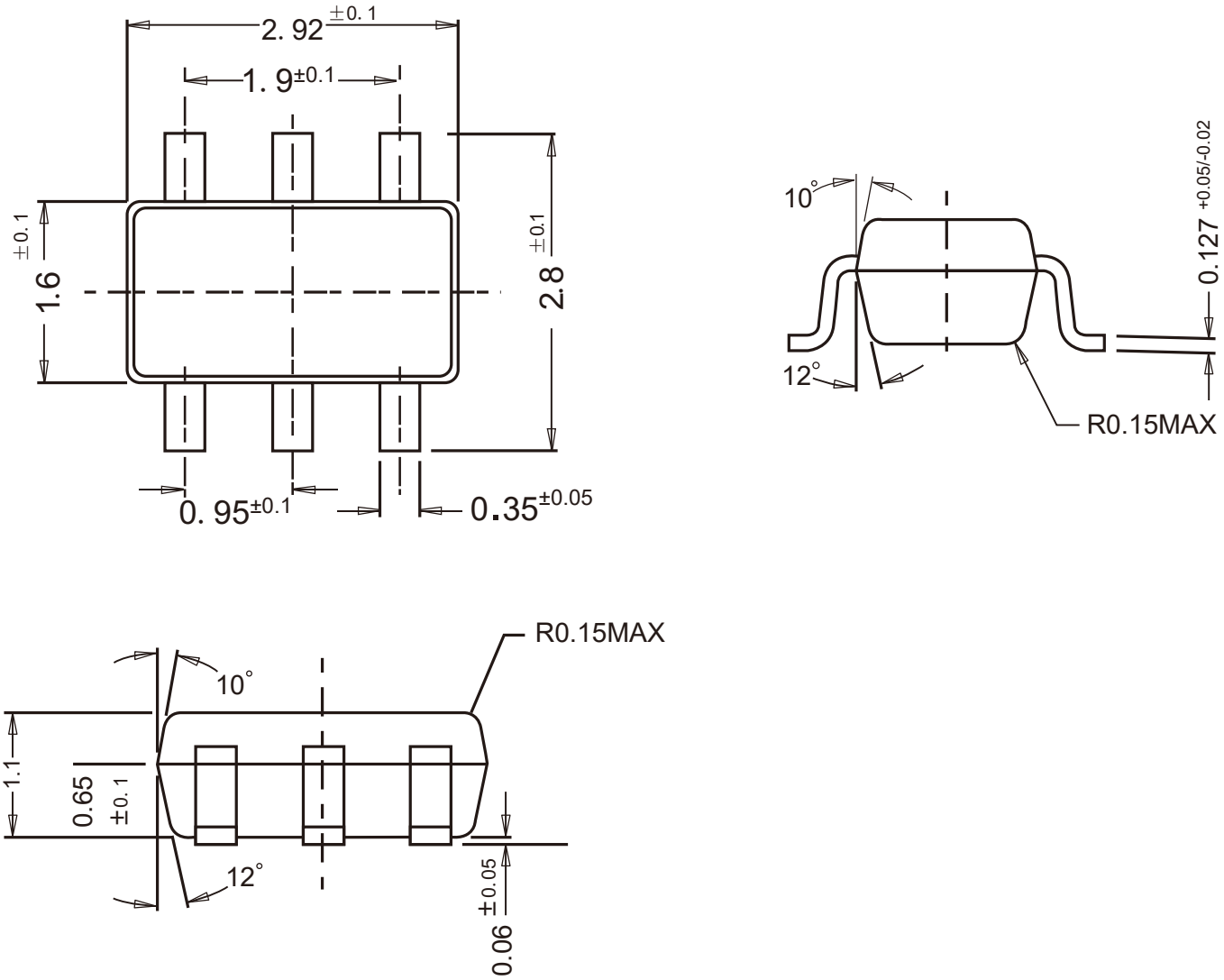

10
1
0.1
-Is Reverse Drain Current (A)
TJ = 150 °C
TJ = 25 °C
TJ = - 50 °C
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
-VSD Source-Drain Voltage (V)


8
6
4
2
0
-VGS Gate-Source Voltage (V)
ID = 3 A
VDS = 10 V
0
2
4
6
8
10
Qg Gate Charge (nC)

Package Outline

SOT-23-6

Dimensions in mm

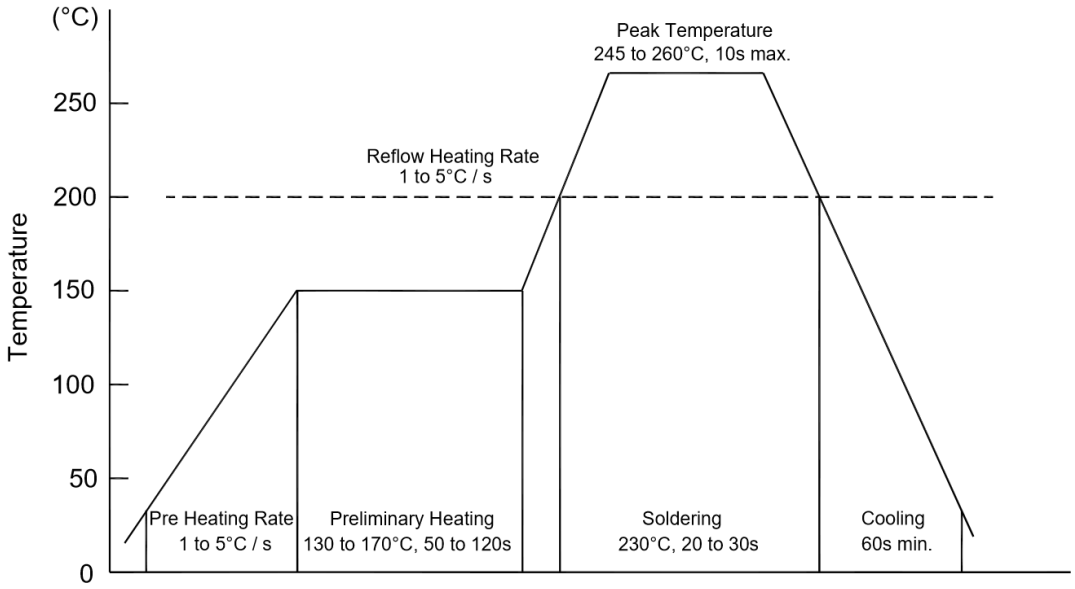


Ordering Information

Device	Package	Shipping
PJM4603CSG	SOT-23-6	3,000PCS/Reel&7inches

Conditions of Soldering and Storage

◆ Recommended condition of reflow soldering



Recommended peak temperature is over 245 ^{O}C. If peak temperature is below 245 ^{O}C, you may adjust the following parameters:

- Time length of peak temperature (longer)
- Time length of soldering (longer)
- Thickness of solder paste (thicker)

◆ Conditions of hand soldering

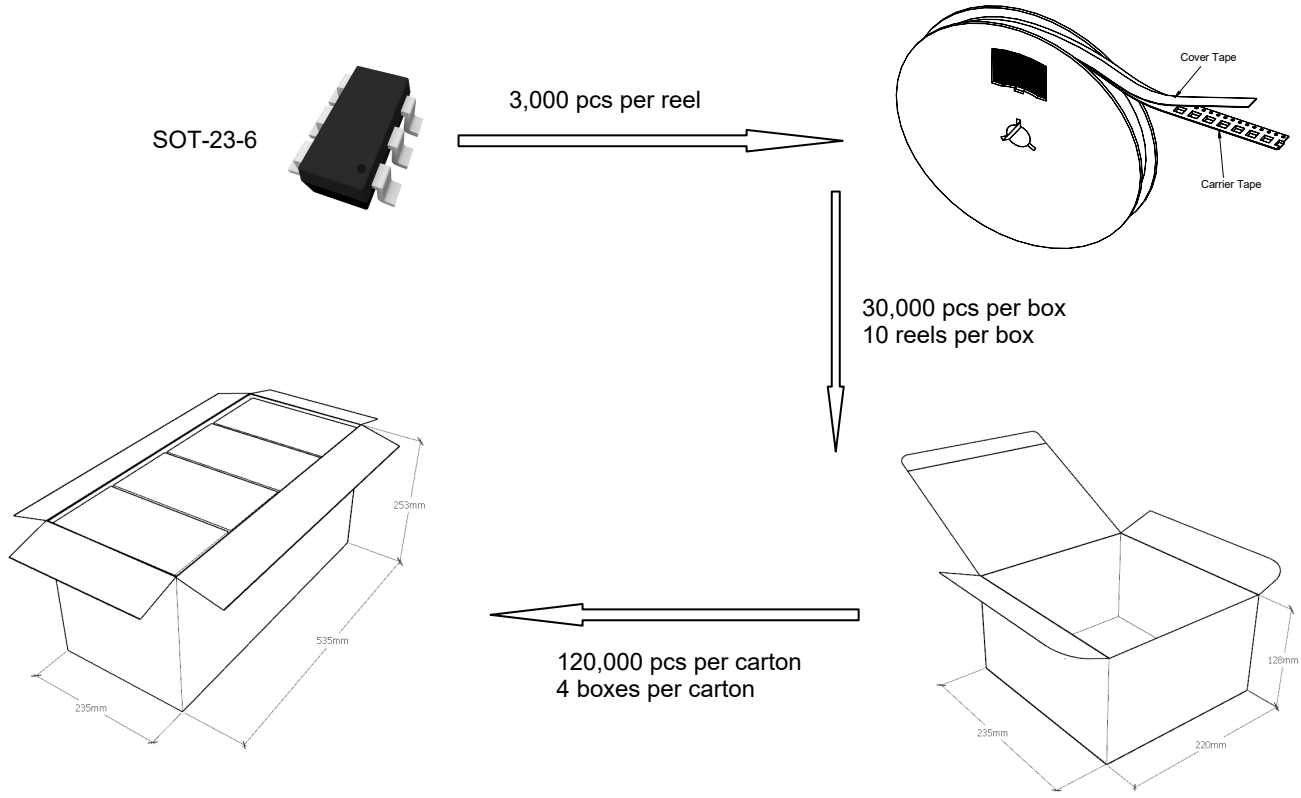
- Temperature: 370 ^{O}C
- Time: 3s max.
- Times: one time

◆ Storage conditions

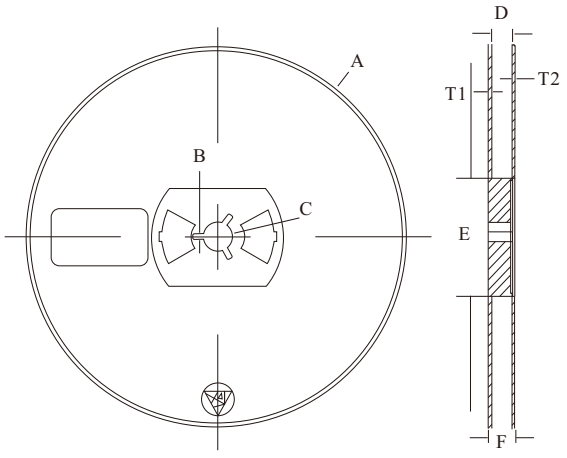
- **Temperature**
  5 to 40 ^{O}C
- **Humidity**
  30 to 80% RH
- **Recommended period**
  One year after manufacturing

Package Specifications

- The method of packaging

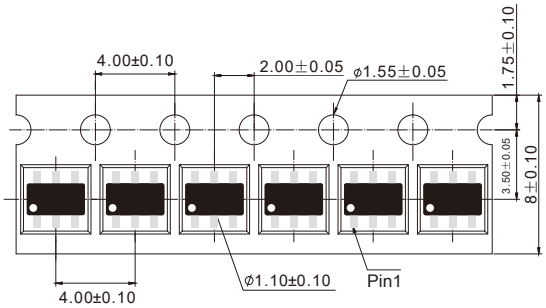


◆ Embossed tape and reel data



Symbol	Value (unit: mm)
A	Ø 177.8±1
B	2.7±0.2
C	Ø 13.5±0.2
E	Ø 54.5±0.2
F	12.3±0.3
D	9.6+2/-0.3
T1	1.0±0.2
T2	1.2±0.2

Reel (7")



Tape (8mm)