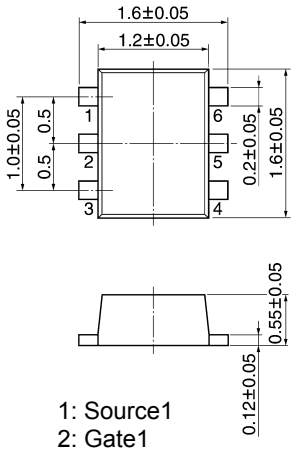
Field Effect Transistor Silicon P Channel MOS Type

High Speed Switching Applications
Analog Switch Applications

- Small package
- Low ON resistance : R_{on} = 12 Ω (max) (@V_{GS} = −4 V)
  : R_{on} = 32 Ω (max) (@V_{GS} = −2.5 V)

Unit: mm



1: Source1
2: Gate1
3: Drain2
4: Source2
5: Gate2
6: Drain1

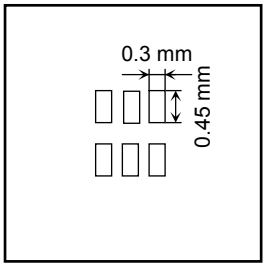
SOT563F

Weight: 3mg (typ.)

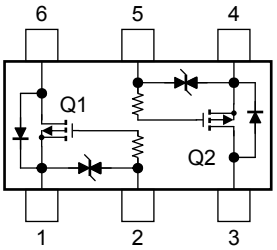
Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

Characteristics		Symbol	Rating	Unit
Drain-Source voltage		V_{DS}	−30	V
Gate-Source voltage		V_{GSS}	±20	V
Drain current	DC	I_D	−100	mA
	Pulse	I_{DP}	−200	
Drain power dissipation (Ta = 25°C)		P_D (Note 1)	150	mW
Channel temperature		T_{ch}	150	°C
Storage temperature range		T_{stg}	−55~150	°C

Note 1: Total rating, mounted on FR4 board
(25.4 mm × 25.4 mm × 1.6 t, Cu Pad: 0.135 mm^2 × 6)



Equivalent Circuit (top view)

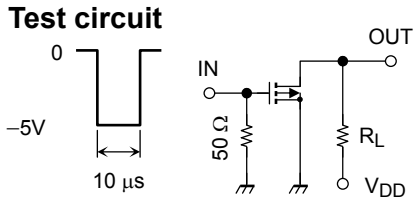


Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

Characteristic		Symbol	Test Condition	MIN.	TYP.	MAX.	UNIT
Gate leakage current		I_{GSS}	V_{GS} = ±16 V, V_{DS} = 0	—	—	±1	μA
Drain-Source breakdown voltage		$V_{(BR)DSS}$	I_D = –0.1 mA, V_{GS} = 0	–30	—	—	V
Drain cut-off current		I_{DSS}	V_{DS} = –30 V, V_{GS} = 0	—	—	–1	μA
Gate threshold voltage		V_{th}	V_{DS} = –3 V, I_D = –0.1 mA	–1.1	—	–1.7	V
Forward transfer admittance		$\lvert Y_{fs} \rvert$	V_{DS} = –3 V, I_D = –10 mA	20	—	—	mS
Drain-Source ON resistance		$R_{DS(ON)}$	I_D = –10 mA, V_{GS} = –4 V	—	8	12	Ω
			I_D = –1 mA, V_{GS} = –2.5 V	—	14	32	
Input capacitance		C_{iss}	V_{DS} = –3 V, V_{GS} = 0, f = 1 MHz	—	9.1	—	pF
Reverse transfer capacitance		C_{rss}		—	3.5	—	pF
Output capacitance		C_{oss}		—	8.6	—	pF
Switching time	Turn-on time	t_{on}	V_{DD} = –5 V, I_D = –10 mA, V_{GS} = 0~–5 V	—	65	—	ns
	Turn-off time	t_{off}		—	175	—	

Switching Time Test Circuit

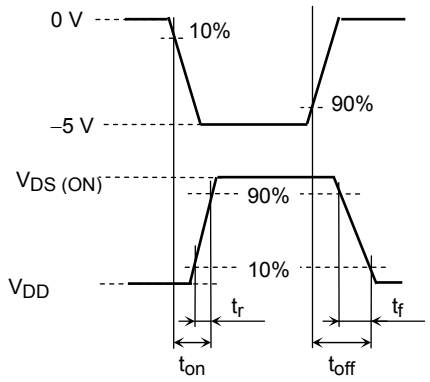
(a) Test circuit

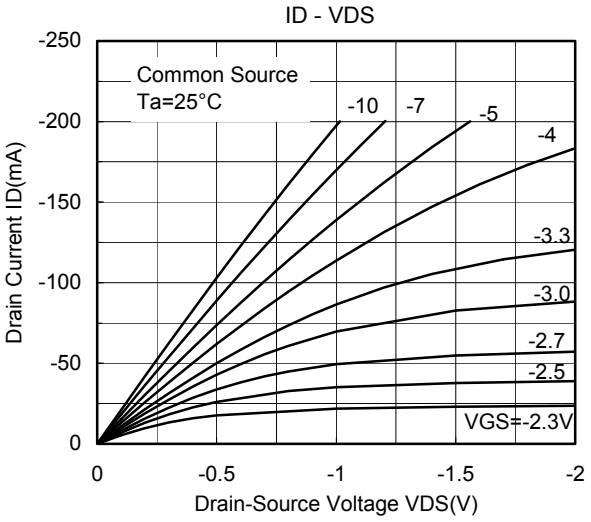


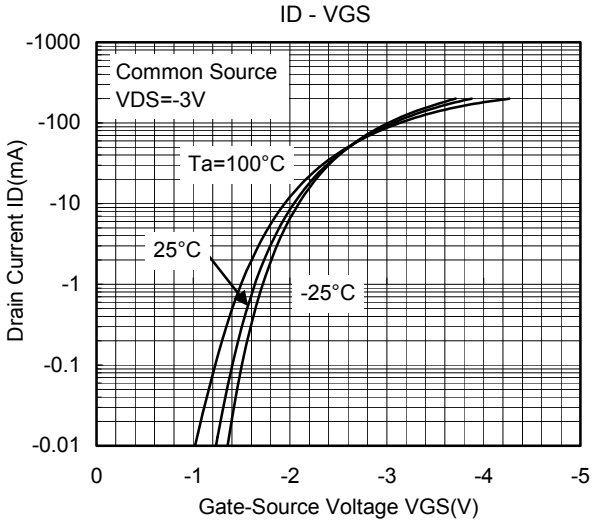
V_{DD} = –5 V
Duty ≦ 1%
V_{IN}: t_r, t_f < 5 ns
(Z_{out} = 50 Ω)
Common Source
Ta = 25°C

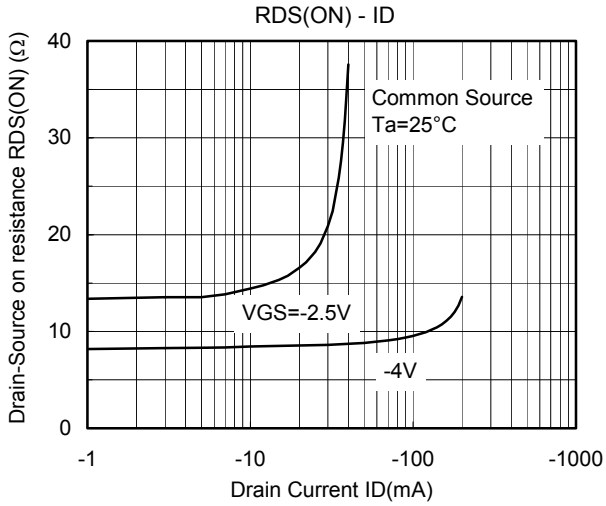
(b) V_{IN}

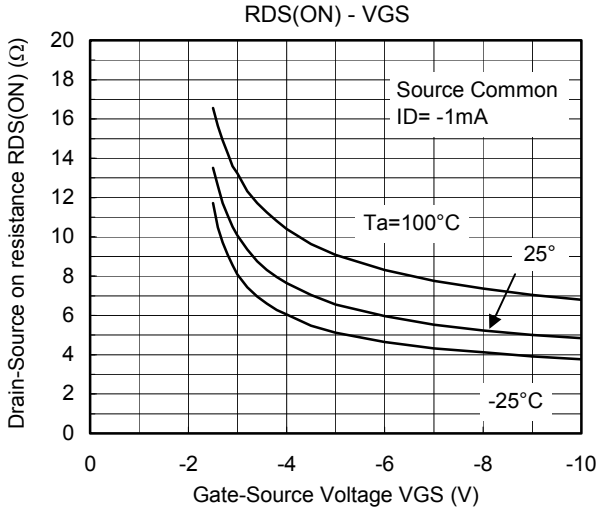
(c) V_{OUT}

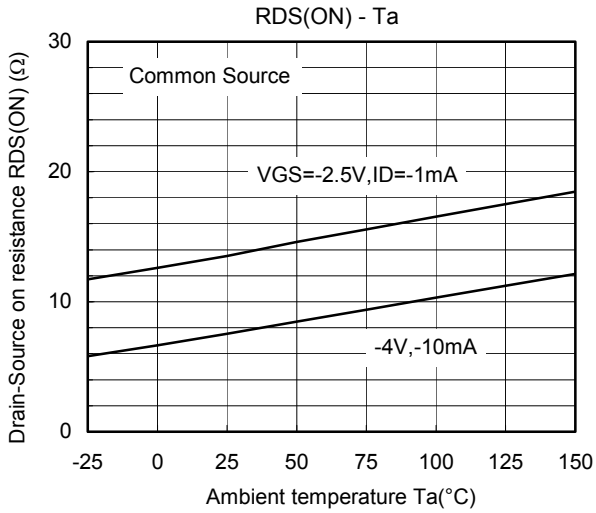


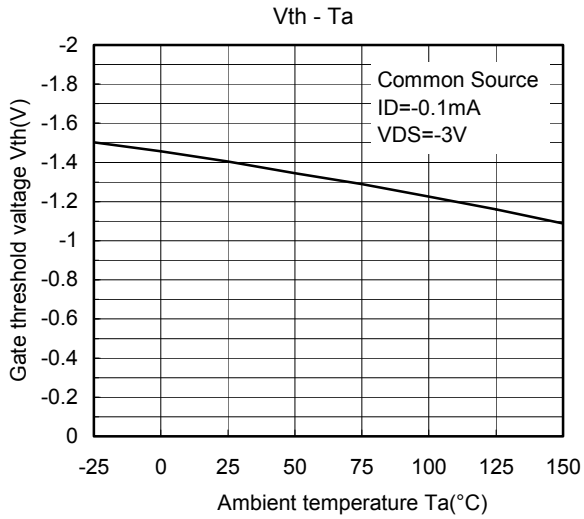

ID - VDS
Common Source
Ta=25°C
-10
-7
-5
-4
-3.3
-3.0
-2.7
-2.5
VGS=-2.3V
Drain Current ID(mA)
Drain-Source Voltage VDS(V)
-250
-200
-150
-100
-50
0
-0.5
-1
-1.5
-2

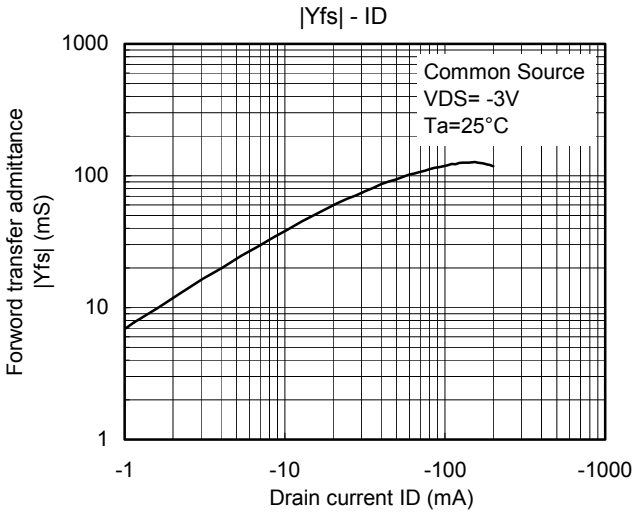

ID - VGS
Common Source
VDS=-3V
Ta=100°C
25°C
-25°C
Drain Current ID(mA)
Gate-Source Voltage VGS(V)
-1000
-100
-10
-1
-0.1
-0.01
0
-1
-2
-3
-4
-5

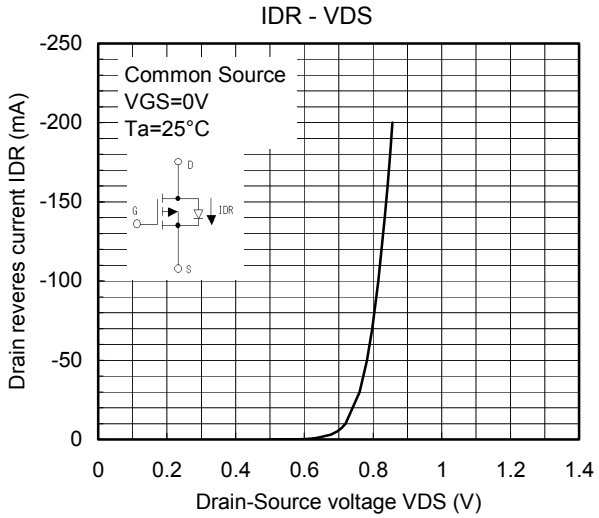

RDS(ON) - ID
Common Source
Ta=25°C
VGS=-2.5V
-4V
Drain-Source on resistance RDS(ON) (Ω)
Drain Current ID(mA)
40
30
20
10
0
-1
-10
-100
-1000

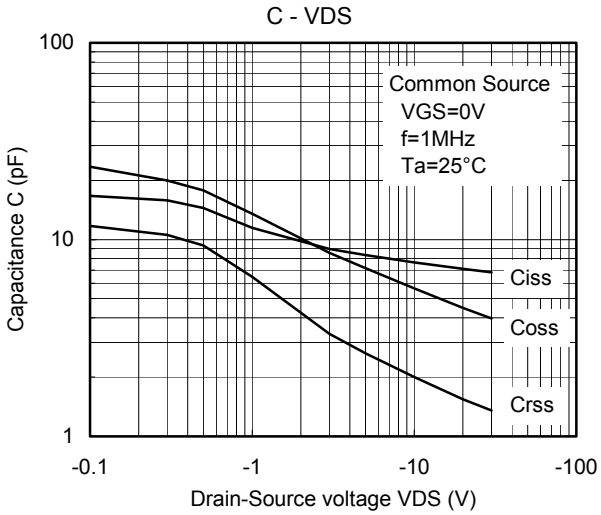

RDS(ON) - VGS
Source Common
ID= -1mA
Ta=100°C
25°
-25°C
Drain-Source on resistance RDS(ON) (Ω)
Gate-Source Voltage VGS (V)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10

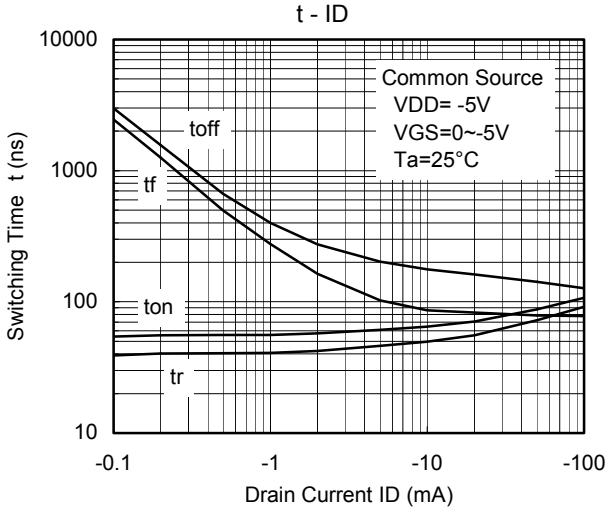

RDS(ON) - Ta
Common Source
VGS=-2.5V,ID=-1mA
-4V,-10mA
Drain-Source on resistance RDS(ON) (Ω)
Ambient temperature Ta(°C)
30
20
10
0
-25
0
25
50
75
100
125
150

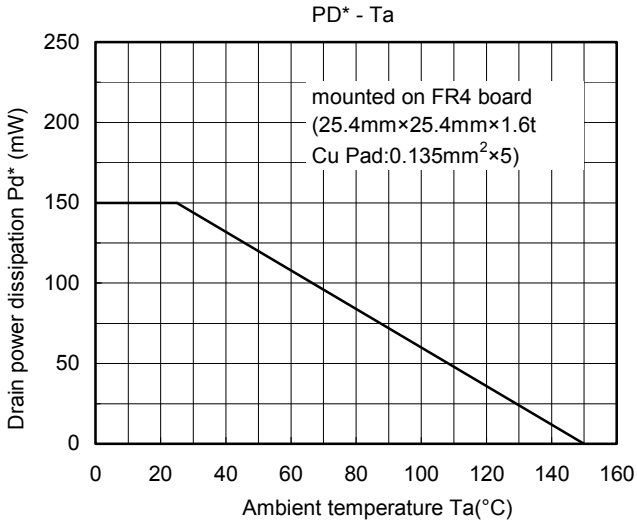

Vth - Ta
Common Source
ID=-0.1mA
VDS=-3V
Gate threshold valtage Vth(V)
Ambient temperature Ta(°C)
-2
-1.8
-1.6
-1.4
-1.2
-1
-0.8
-0.6
-0.4
-0.2
0
-25
0
25
50
75
100
125
150











*: Total Rating