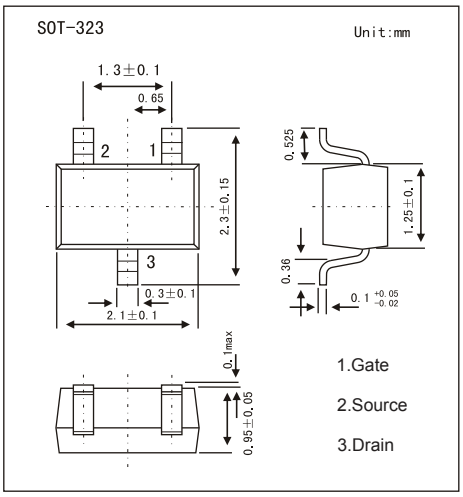
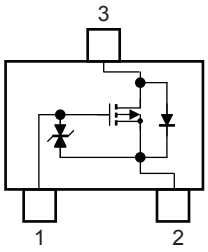
P-CHANNEL MOSFET FOR SWITCHING



■ Features

- $V_{DS\ (V)}$ = -20 V
- I_D = -2.0 A
- 1.5 V drive
- Low ON-resistance:
  $R_{DS(ON)}$ = 132 mΩ (max) (@V_{GS} = -2.5 V)
  $R_{DS(ON)}$ = 130 mΩ (max) (@V_{GS} = -4.5 V)



■ Absolute Maximum Ratings (Ta = 25℃)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	
Continuous Drain Current	I_D (Note 1)	-2.0	A
Pulsed Drain Current	I_{DP} (Note 1)	-6.0	
Power Dissipation	P_D (Note 2)	500	mW
	P_D (t < 1s)	1000	
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{stg}	-55 to 150	

Note 1: The channel temperature should not exceed 150°C during use.

Note 2: Mounted on FR4 board.

(25.4 mm × 25.4 mm × 1.6 mm, Cu Pad: 645 mm^2)

■ Marking

Marking	PA1 **

■ Electrical Characteristics (Ta = 25℃)

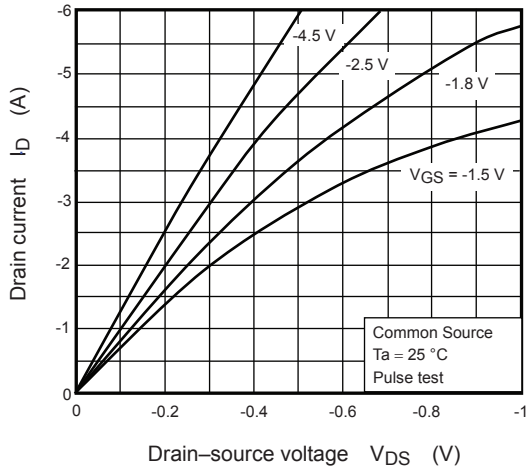
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=-1mA, V_{GS}=0V	-20			V
	V_{DSX}	I_D=-1mA, V_{GS}=5V (Note 4)	-15			
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±1	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=-3V , I_D=-1mA	-0.3		-1.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-1.0A (Note 3)			130	mΩ
		V_{GS}=-2.5V, I_D=-0.6A (Note 3)			132	
		V_{GS}=-1.8V, I_D=-0.4A (Note 3)				
		V_{GS}=-1.5V, I_D=-0.2A (Note 3)				
Forward Transconductance	g_{FS}	V_{DS}=-3V, I_D=-1.0A (Note 3)	2.2			S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-10V, f=1MHz		270		pF
Output Capacitance	C_{oss}			40		
Reverse Transfer Capacitance	C_{rss}			32		
Total Gate Charge	Q_g	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-2.0A		4.6		nC
Gate Source Charge	Q_{gs1}			0.4		
Gate Drain Charge	Q_{gd}			0.9		
Turn-On DelayTime	$t_{d(on)}$	V_{DS}=-10V, I_D=-1.0A V_{GS}=0 to -2.5V, R_G=4.7Ω		17		ns
Turn-Off DelayTime	$t_{d(off)}$			43		
Diode Forward Voltage	V_{SD}	I_S=-3.0A,V_{GS}=0V (Note 3)			-1.2	V

Note 3: Pulse test

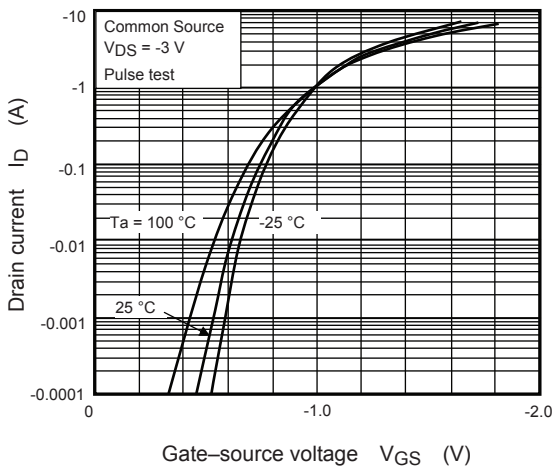
Note 4: If a forward bias is applied between gate and source, this device enters V(BR)DSX mode. Note that the drain-source breakdown voltage is lowered in this mode.

■ Typical Characterisitics

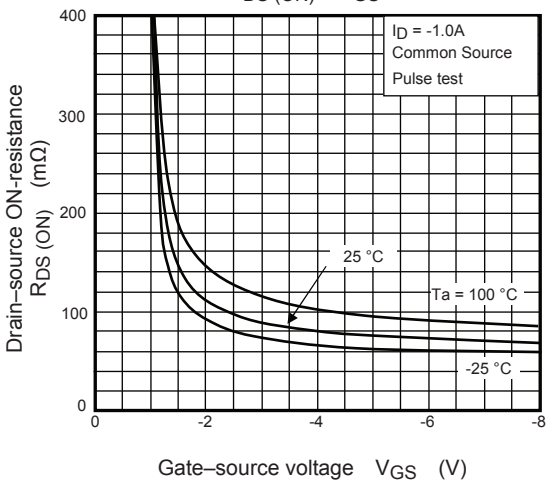
I_D – V_{DS}



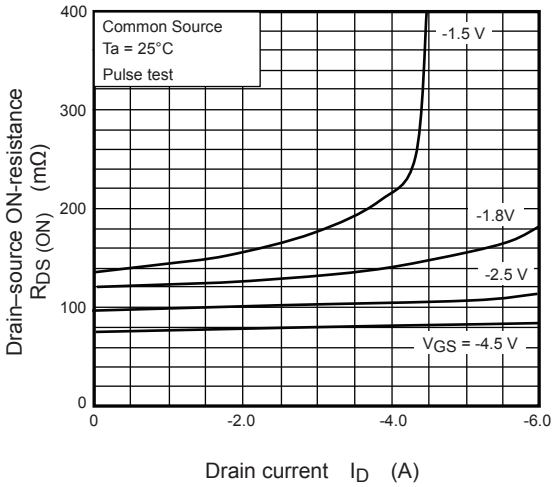
I_D – V_{GS}



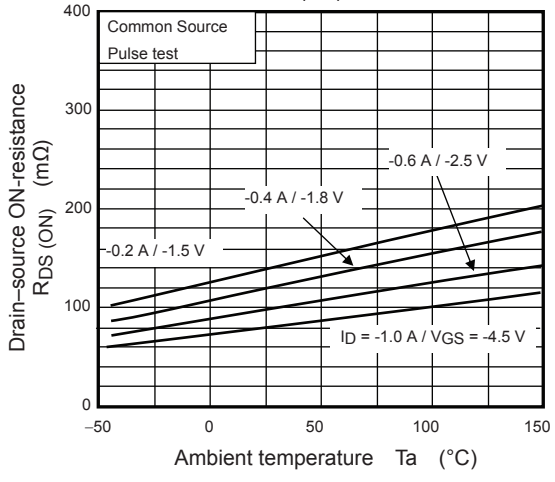
$R_{DS\ (ON)}$ – V_{GS}



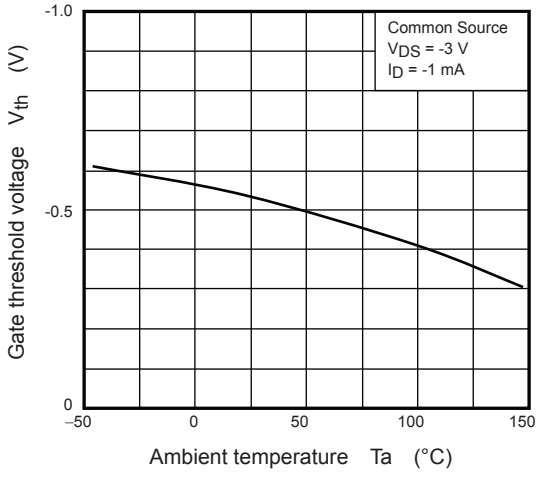
$R_{DS\ (ON)}$ – I_D

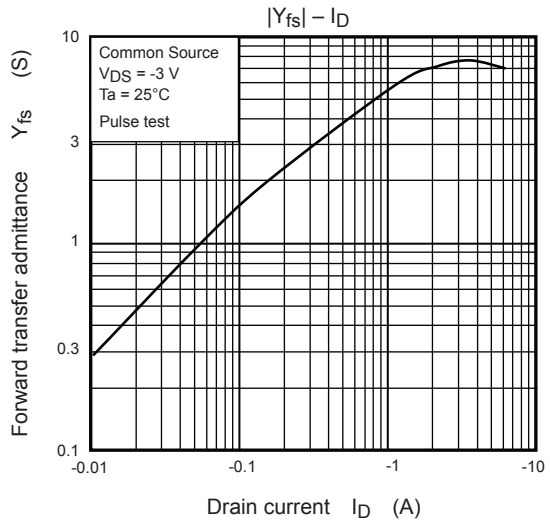


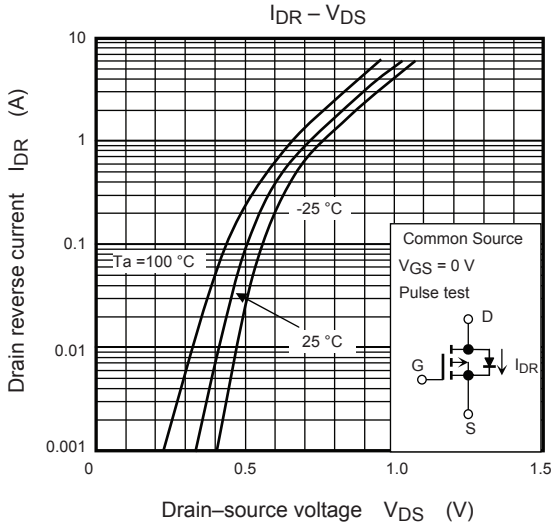
$R_{DS\ (ON)}$ – Ta

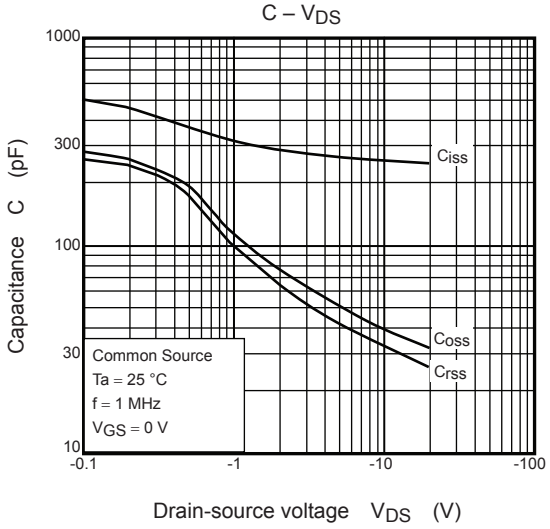


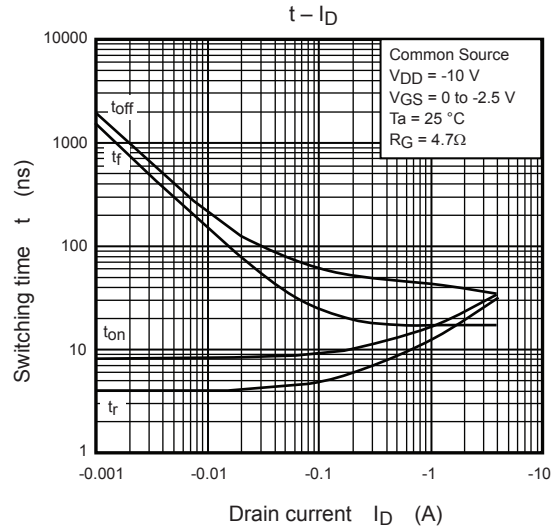
V_{th} – Ta

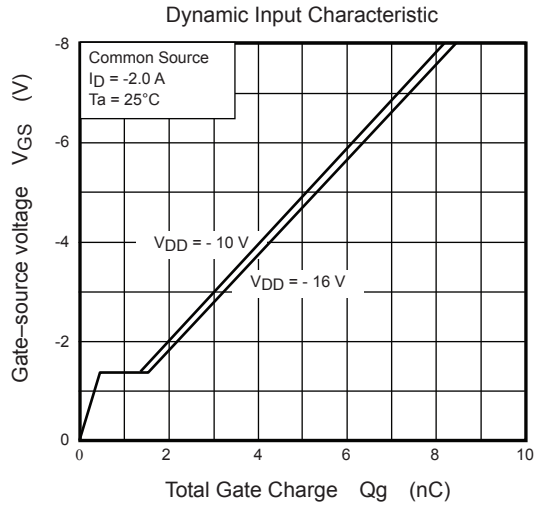



|Yfs| – ID
Common Source
VDS = -3 V
Ta = 25°C
Pulse test
Forward transfer admittance Yfs (S)
Drain current ID (A)


IDR – VDS
Common Source
VGS = 0 V
Pulse test
-25 °C
Ta =100 °C
25 °C
Drain reverse current IDR (A)
Drain–source voltage VDS (V)


C – VDS
Common Source
Ta = 25 °C
f = 1 MHz
VGS = 0 V
Ciss
Coss
Crss
Capacitance C (pF)
Drain-source voltage VDS (V)


t – ID
Common Source
VDD = -10 V
VGS = 0 to -2.5 V
Ta = 25 °C
RG = 4.7Ω
toff
tf
ton
tr
Switching time t (ns)
Drain current ID (A)


Dynamic Input Characteristic
Common Source
ID = -2.0 A
Ta = 25°C
VDD = - 10 V
VDD = - 16 V
Gate–source voltage VGS (V)
Total Gate Charge Qg (nC)