SEMICONDUCTOR
TECHNICAL DATA

FTK2004

20V N−Channel MOSFETs

Features

- Lead Free Product is Acquired
- Surface Mount Package
- N-Channel Switch with Low R_{DS}(on)
- Operated at Low Logic Level Gate Drive

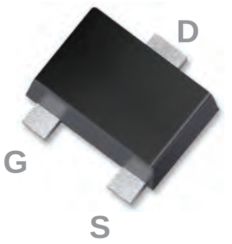
Product Summery

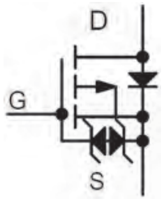
BVDSS	RDSON (TYP.)	ID (MAX)
20V	240mΩ	0.6A
20V	280mΩ	
20V	410mΩ	
20V	450mΩ	

Applications

- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

SOT-723 Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±8	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	400	mA
I_{DM}	Pulsed Drain Current[2]	1.2	A
P_D@T_A=25℃	Total Power Dissipation[3]	0.150	W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient (note 1)	823	℃/W
T_J	Junction Temperature	150	℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_L	Lead Temperature for Soldering Purposes(1/8” from case for 10 s)	260	℃

Electrical Characteristics **(T_J=25℃, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	20	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.05	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=4.5V , I_D=0.4A	---	240	450	mΩ
		V_{GS}=2.5V , I_D=0.3A	---	280	765	
		V_{GS}=1.8V , I_D=0.2A	---	410	850	mΩ
		V_{GS}=1.5V , I_D=0.1A	---	450	950	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	0.35	---	1.0	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-3.7	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=16V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=16V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=± 8V , V_{DS}=0V	---	---	± 10	uA
gfs	Forward Transconductance	V_{DS}=5V , I_D=0.1A	---	1.5	---	S
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=6Ω, I_D=0.1A	---	5.8	---	ns
T_r	Rise Time		---	2.9	---	
$T_{d(off)}$	Turn-Off Delay Time		---	18	---	
T_f	Fall Time		---	9	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	88	160	pF
C_{oss}	Output Capacitance		---	15	30	
C_{rss}	Reverse Transfer Capacitance		---	10	22	

Diode Characteristics

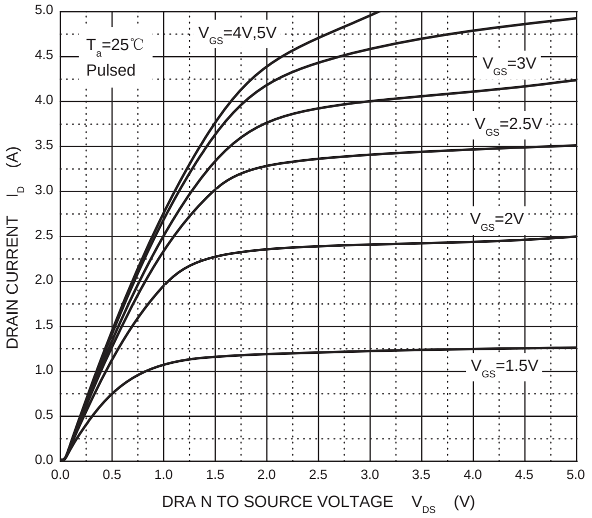
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	100	mA
I_{SM}	Pulsed Source Current[2,4]		---	---	0.5	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=0.2A , T_J=25℃	---	---	1.2	V

Notes :

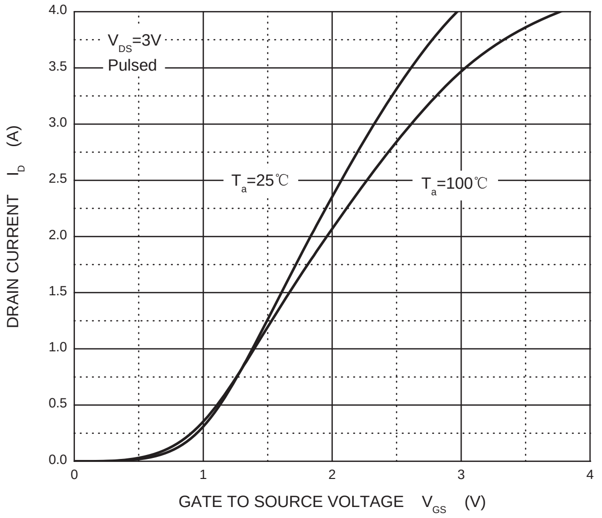
1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse Width=300µs, Duty Cycle=2%.
3. Switching characteristics are independent of operating junction temperatures.
4. Guaranteed by design, not subject to producting.

Typical Performance Characteristics

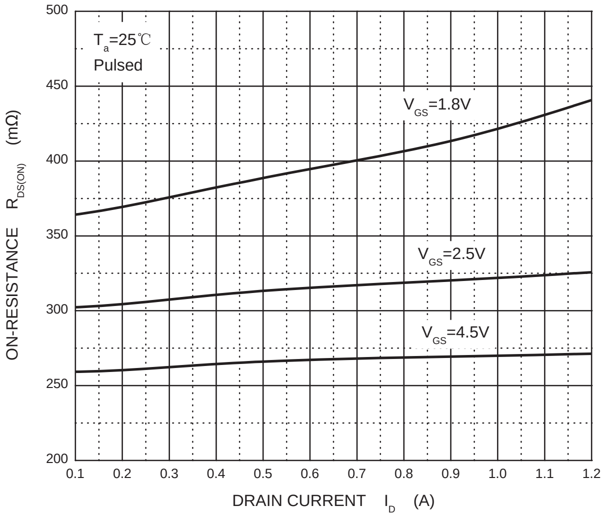
Output Characteristics



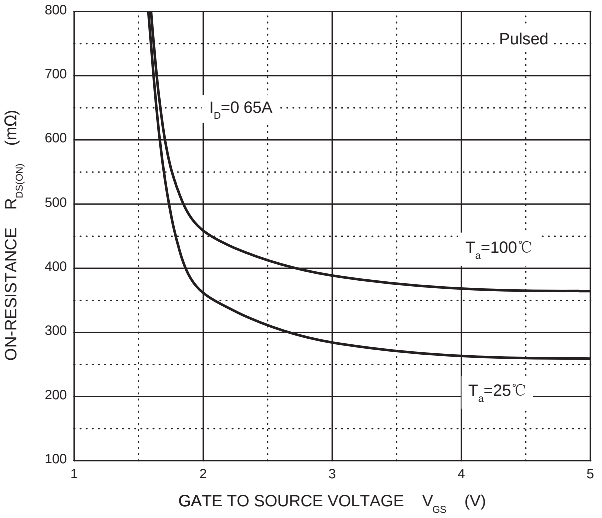
Transfer Characteristics



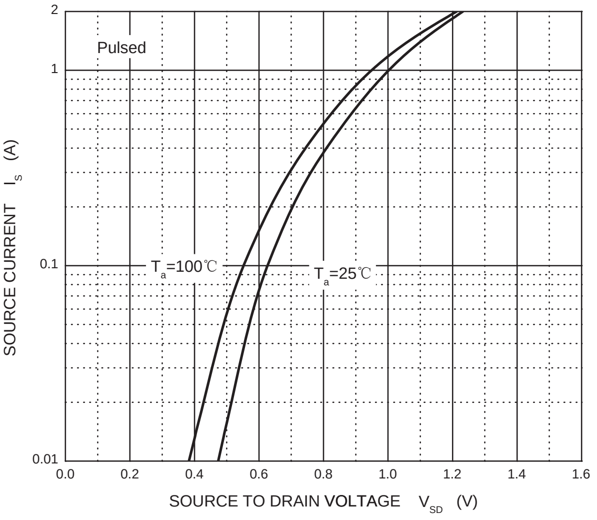
$R_{DS(ON)}$ —— I_D



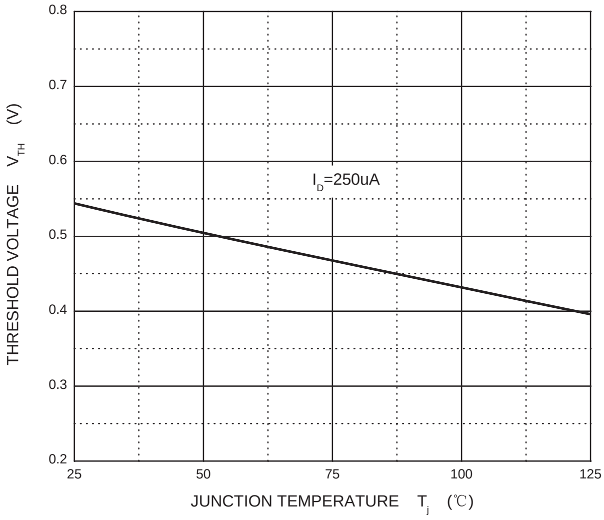
$R_{DS(ON)}$ —— V_{GS}



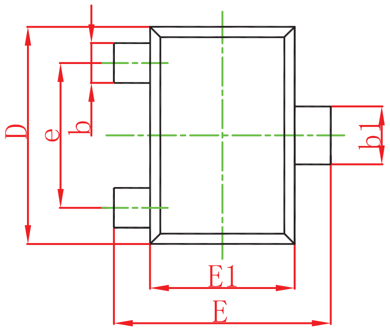
I_S —— V_{SD}

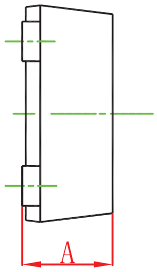


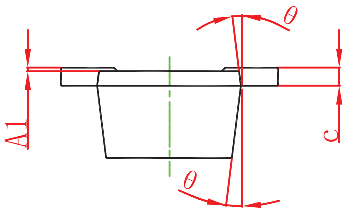
Threshold Voltage



SOT-723 Package Outline Dimensions

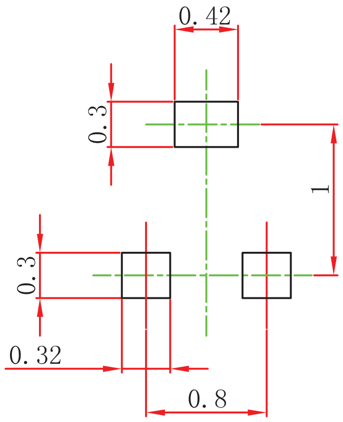






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.430	0 500	0.017	0.020
A1	0.000	0 050	0.000	0.002
b	0.170	0 270	0.007	0.011
b1	0.270	0 370	0.011	0.015
c	0.080	0.150	0.003	0.006
D	1.150	1 250	0.045	0.049
E	1.150	1 250	0.045	0.049
E1	0.750	0 850	0.030	0.033
e	0.800TYP.		0.031TYP.	
θ	7° REF.		7° REF.	

SOT-723 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.