20V N-Channel Enhancement Mode MOSFET

Description

The NP7404EVR has been designed to minimize the on-state resistance (RDS(on)) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

General Features

- V_{DS} =20V，I_D =3A
  $R_{DS(ON)}$(Typ.)=95mΩ @V_{GS}=4.5V
  $R_{DS(ON)}$(Typ.)=119mΩ @V_{GS}=2.5V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

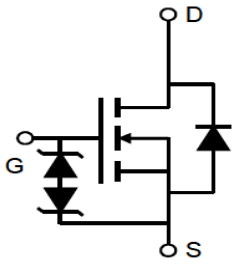
Application

- PWM applications
- Load switch

Package

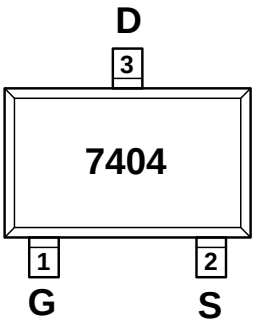
- SOT-23

Schematic diagram



Marking and pin assignment

SOT-23
(TOP VIEW)



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
NP7404EVR-G	-55°C to +150°C	SOT23	3000

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	20	V
Gate-source voltage		V_{GS}	±8	V
Drain current-continuous[a]@Tj=125℃		I_D	3	A
-pulse *d*[b]		I_{DM}	12	A
Maximum power dissipation	T_A=25℃	P_D	1.92	W
Operating junction Temperature range		Tj	-55—150	℃

Notes:

a. surface mounted on FR4 board,t≤10sec

b. pulse test: pulse width≤300μs,duty≤2%

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{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	I_{GSS}	V_{DS}=0V, V_{GS}=±8V	-	-	±10	μA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.45	0.68	1	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=0.5A	-	95	120	mΩ
		V_{GS}=2.5V, I_D=0.5A	-	119	154	
Forward transconductance	gfs	V_{DS}=5V I_D=1A	20		-	nC
Dynamic Characteristics						
Input capacitance	C_{ISS}	V_{DS}=10V ,V_{GS}=0V f=1.0MHz	-	120	-	pF
Output capacitance	C_{OSS}		-	20	-	
Reverse transfer capacitance	C_{RSS}		-	10	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DS}=10V V_{GS}=5V R_L=250ohm R_{GEN}=50ohm	-	8	-	ns
Rise time	tr		-	9	-	
Turn-off delay time	$t_{D(OFF)}$		-	15	-	
Fall time	tf		-	21	-	
Total gate charge	Qg	V_{DS}=10V,I_D=0.1A V_{GS}=5V	-	1.9	-	nC
Gate-source charge	Qgs		-	1.5	-	
Gate-drain charge	Qgd		-	1.2	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V_{SD}	V_{GS}=0V,Is=1A	-	0.8	1.5	V

Thermal Characteristics

Parameter	Symbol	Typ	max	Unit
Thermal Resistance junction-to ambient	RθJa	170	-	℃/W

Typical Performance Characteristics

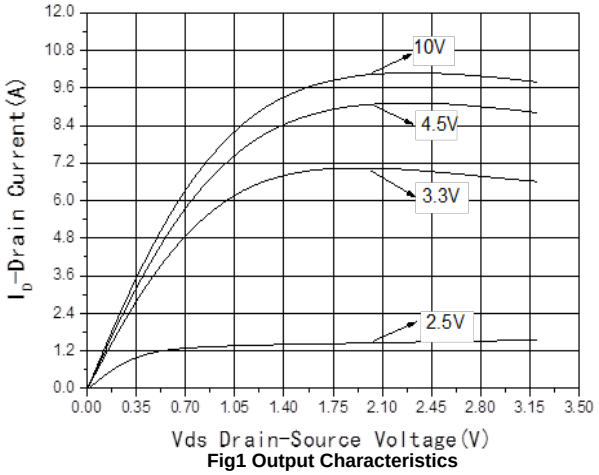


Fig1 Output Characteristics

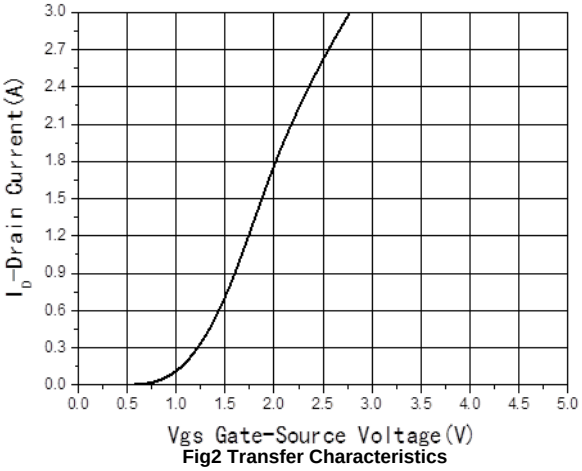


Fig2 Transfer Characteristics

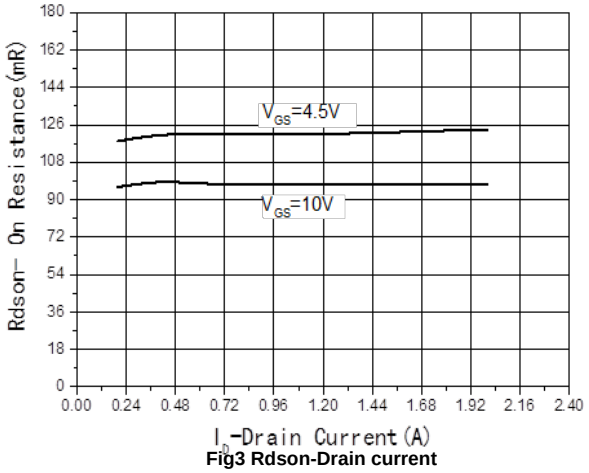


Fig3 Rdson-Drain current

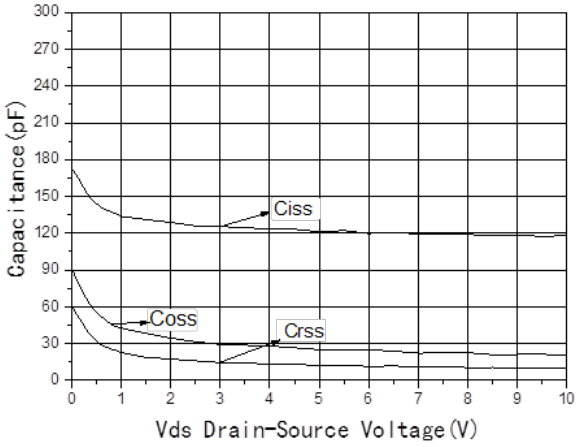


Fig4 Capacitance vs Vds

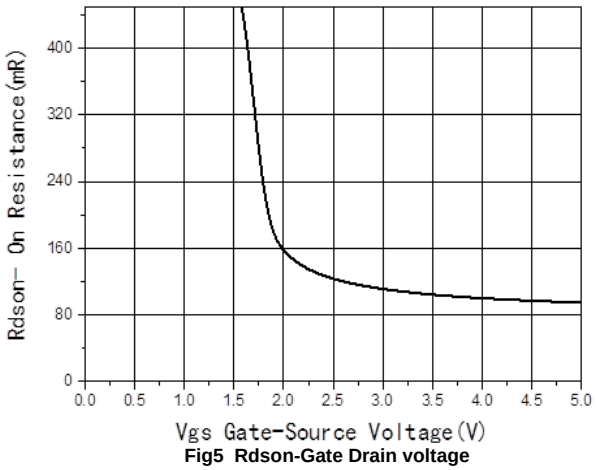


Fig5 Rdson-Gate Drain voltage

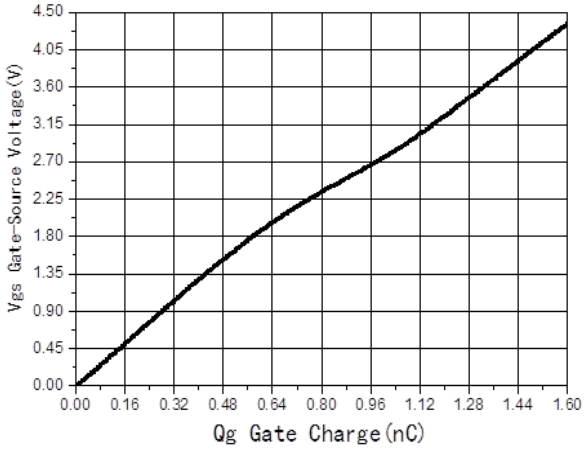


Fig6 Gate Charge

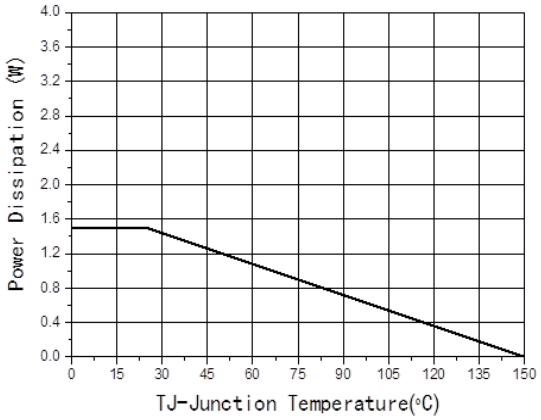


Fig7 Power De-rating

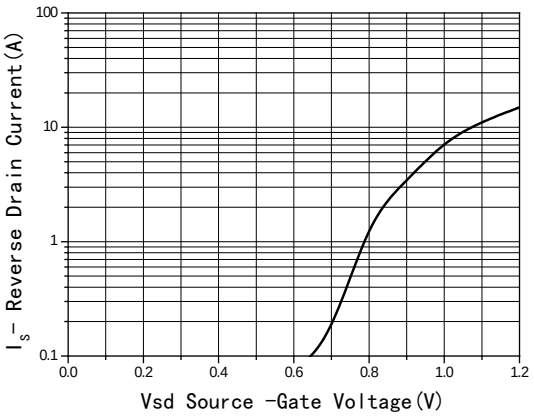
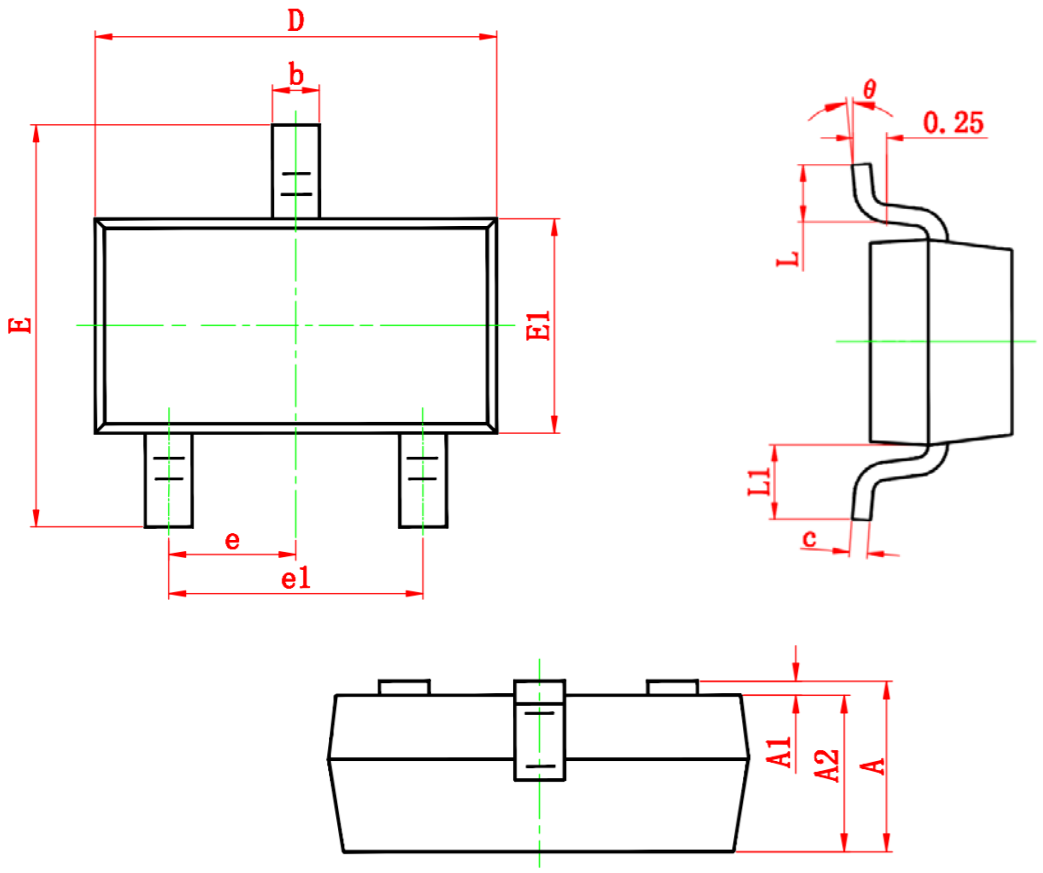


Fig8 Source-Drain Diode Forward

Package Information

- **SOT-23**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	2.250	2.550	0.089	0.100
E1	1.200	1.400	0.047	0.055
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.300	0.500	0.012	0.020
L1	0.550 REF.		0.022 REF.	
θ	0°	8°	0°	8°