

# Complementary Pair Enhancement Mode Field Effect Transistor

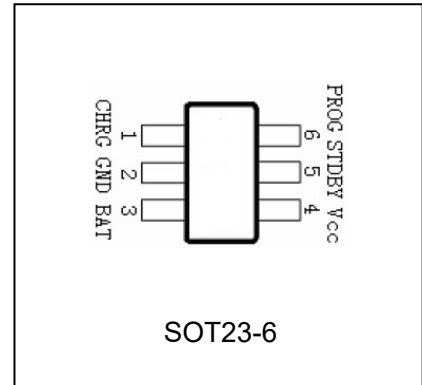
## BSS8402DM

### FEATURES

- Low On-Resistance.
- Low Gate Threshold Voltage.
- Low Input Capacitance.
- Fast Switching Speed.
- Low Input/Output Leakage.
- Complementary Pair.



Lead-free



### ORDERING INFORMATION

Type No.	Marking	Package Code
BSS8402ÖT	KNP	SOT-363

### MAXIMUM RATING – Total Device @ Ta=25°C unless otherwise specified

Symbol	Parameter	Value	Units
P <sub>D</sub>	Power Dissipation	200	mW
R <sub>θJA</sub>	Thermal resistance, Junction-to-Ambient	625	°C/W
T <sub>J</sub> , T <sub>stg</sub>	Junction and Storage Temperature	-55 to +150	°C

### Maximum Ratings N-CHANNEL –Q<sub>1</sub>, 2N7002 Section

@ Ta=25°C unless otherwise specified

Symbol	Parameter	Value	Units
V <sub>DSS</sub>	Drain-Source voltage	60	V
V <sub>DGR</sub>	Drain-Gate voltage(R <sub>GS</sub> ≤1.0MΩ)	60	V
V <sub>GSS</sub>	Gate -Source voltage continuous Pulsed	± 20 ± 40	V
I <sub>D</sub>	Drain current continuous continuous@100℃ Pulsed	115 73 800	mA

## Complementary Pair Enhancement Mode Field Effect Transistor **BSS8402DM**

### Maximum Ratings N-CHANNEL –Q<sub>2</sub>, BSS84 Section

@ Ta=25°C unless otherwise specified

Symbol	Parameter	Value	Units
V <sub>DSS</sub>	Drain-Source voltage	-50	V
V <sub>DGR</sub>	Drain-Gate voltage(R <sub>GS</sub> ≤1.0MΩ)	-50	V
V <sub>GSS</sub>	Gate -Source voltage continuous	± 20	V
I <sub>D</sub>	Drain current continuous	-130	mA

### ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

#### Q<sub>1</sub>,2N7002 Section

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =10μA	60	70	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	-	2.5	
Gate-body Leakage Forward Reverse	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =20V	-	-	100	nA
		V <sub>DS</sub> =0V, V <sub>GS</sub> =-20V	-	-	-100	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V	-	-	1	μA
		V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, T <sub>j</sub> =125°C	-	-	500	
On-state Drain Current	I <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =7.5V	0.5	1.0	-	A
Drain-Source on-voltage	V <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =500mA	-	0.6	3.75	V
		V <sub>GS</sub> =5V, I <sub>D</sub> =50mA	-	0.09	1.5	
Forward transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =200mA	80	-	-	mS
Static drain-Source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =5.0V, I <sub>D</sub> =50mA	-	3.2	7.5	Ω
		V <sub>GS</sub> =10V, I <sub>D</sub> =500mA, T <sub>j</sub> =125°C	-	4.4	13.5	
Input capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	22	50	pF
Output capacitance	C <sub>OSS</sub>		-	11	25	
Reverse transfer capacitance	C <sub>RSS</sub>		-	2	5	
Turn-On Delay Time	t <sub>D(on)</sub>	V <sub>DD</sub> = 30V, I <sub>D</sub> = 0.2A, R <sub>L</sub> = 150Ω, V <sub>GS</sub> = 10V,	-	7	20	ns
Turn-Off Delay Time	t <sub>D(off)</sub>	R <sub>GEN</sub> = 25Ω	-	11	20	ns

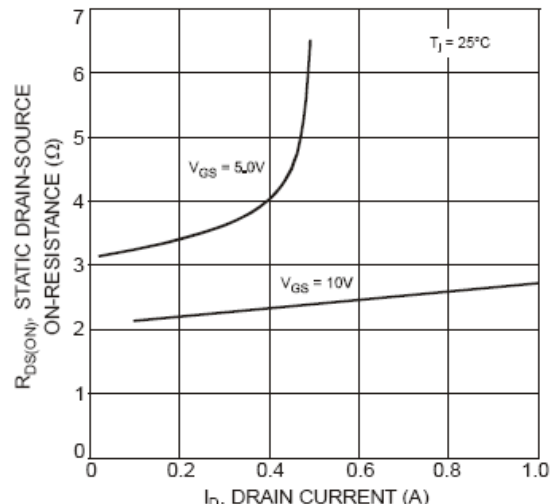
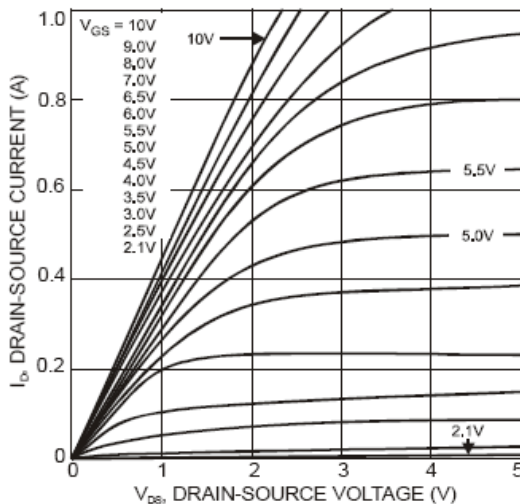
## Complementary Pair Enhancement Mode Field Effect Transistor **BSS8402DM**

ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

Q<sub>2</sub>,BSS84 Section

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-50	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-1mA$	-0.8	-	-2	
Gate-body Leakage      Forward Reverse	$I_{GSS}$	$V_{DS}=0V, V_{GS}=20V$ $V_{DS}=0V, V_{GS}=-20V$	-	-	100 -100	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-50V, V_{GS}=0V, T_j=25^\circ C$	-	-	-15	nA
		$V_{DS}=-50V, V_{GS}=0V, T_j=125^\circ C$	-	-	-60	
		$V_{DS}=-25V, V_{GS}=0V, T_j=25^\circ C$	-	-	-100	
Forward transconductance	$g_{FS}$	$V_{DS}=-25V, I_D=-0.1A$	0.05	-	-	S
Static drain-Source on-resistance	$R_{DS(ON)}$	$V_{GS}=-5V, I_D=-0.1A$	-	-	10	$\Omega$
On-state drain current	$I_{D(ON)}$	$V_{GS}=10V, V_{DS}=7.5V$	0.5	1.0	-	A
Input capacitance	$C_{ISS}$	$V_{DS}=-25V, V_{GS}=0V, f=1.0MHz$	-	-	45	pF
Output capacitance	$C_{OSS}$		-	-	25	
Reverse transfer capacitance	$C_{RSS}$		-	-	12	
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=-30V, I_D=-0.27A,$ $V_{GS}=-10V, R_{GEN}=50\Omega$	-	10	-	ns
Turn-Off Delay Time	$t_{D(OFF)}$		-	18	-	ns

TYPICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified



# Complementary Pair Enhancement Mode Field Effect Transistor

## BSS8402DM

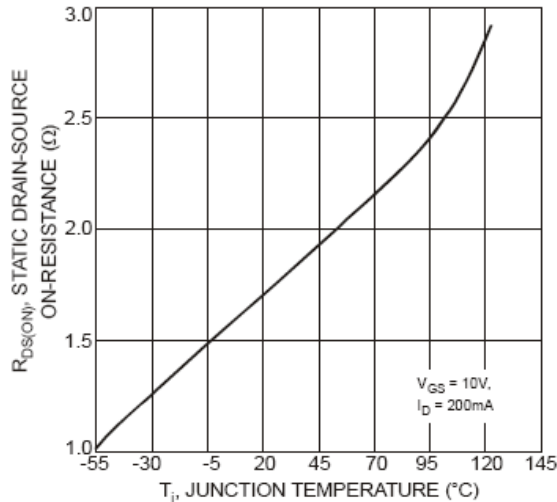


Fig. 3 On-Resistance vs. Junction Temperature

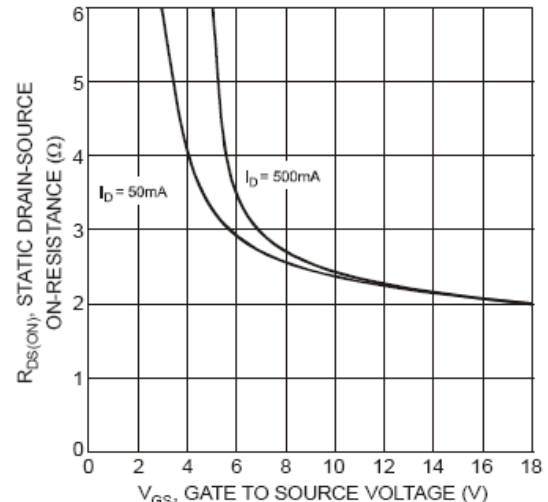


Fig. 4 On-Resistance vs. Gate-Source Voltage

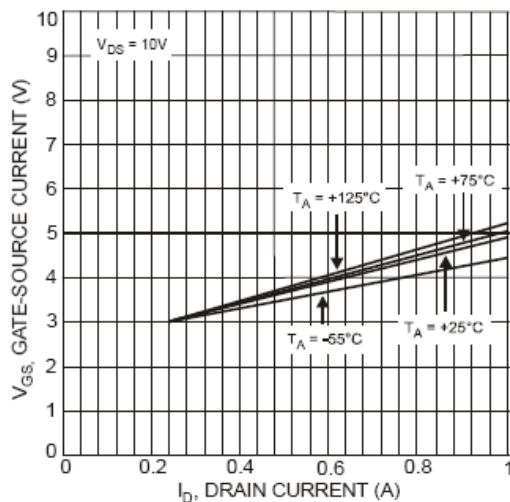


Fig. 5 Typical Transfer Characteristics

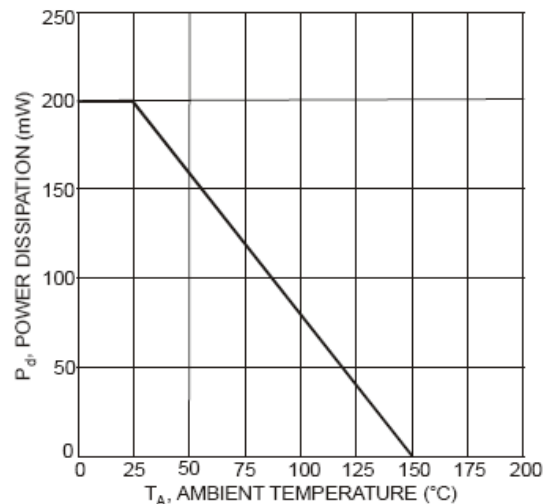


Fig. 6 Max Power Dissipation vs. Ambient Temperature

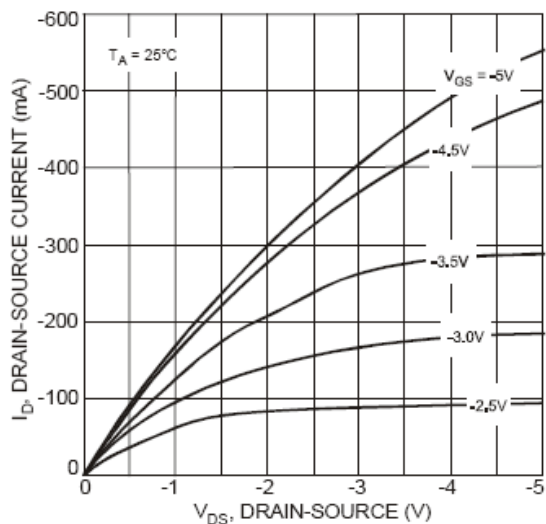


Fig. 7 Drain-Source Current vs. Drain-Source Voltage

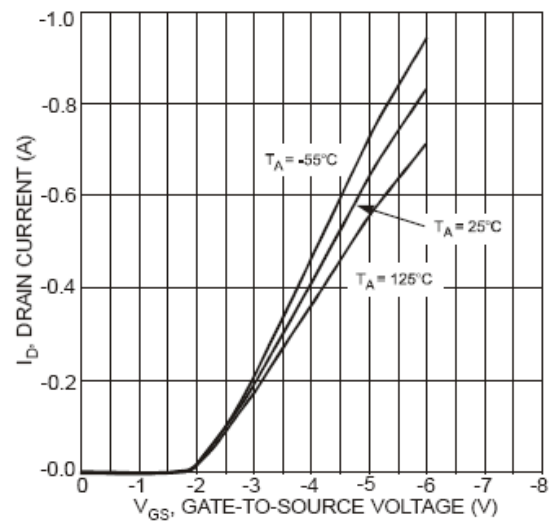


Fig. 8 Drain Current vs. Gate-Source Voltage

# Complementary Pair Enhancement Mode Field Effect Transistor

## BSS8402DM

Fig. 7 Drain-Source Current vs. Drain-Source Voltage

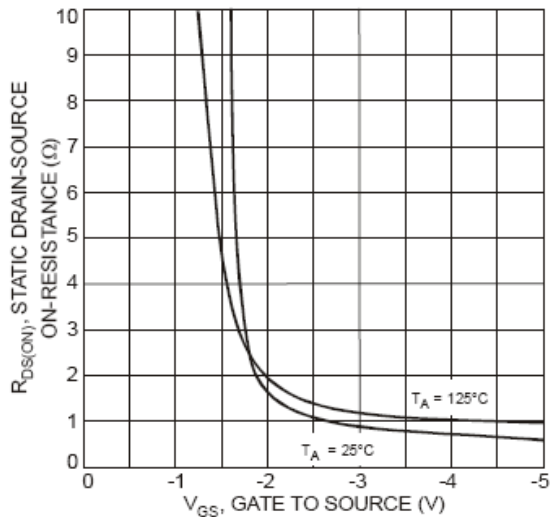


Fig. 9 On-Resistance vs. Gate-Source Voltage

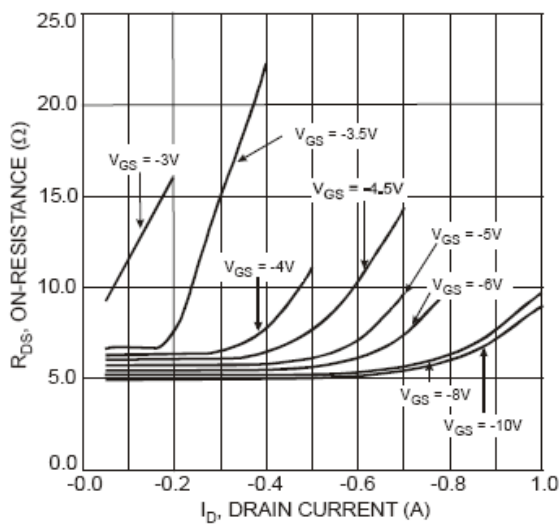


Fig. 11 On-Resistance vs. Drain Current

Fig. 8 Drain Current vs. Gate-Source Voltage

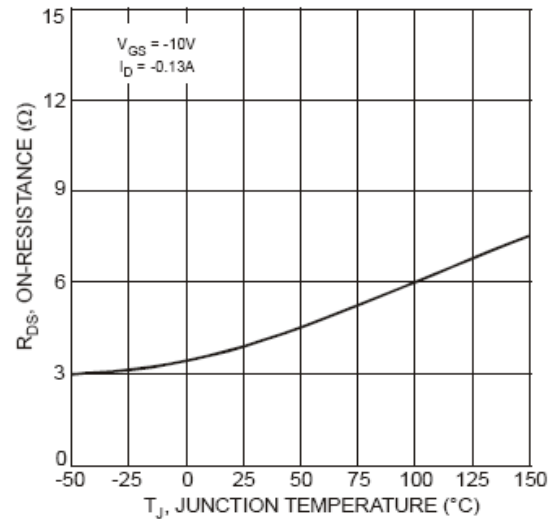
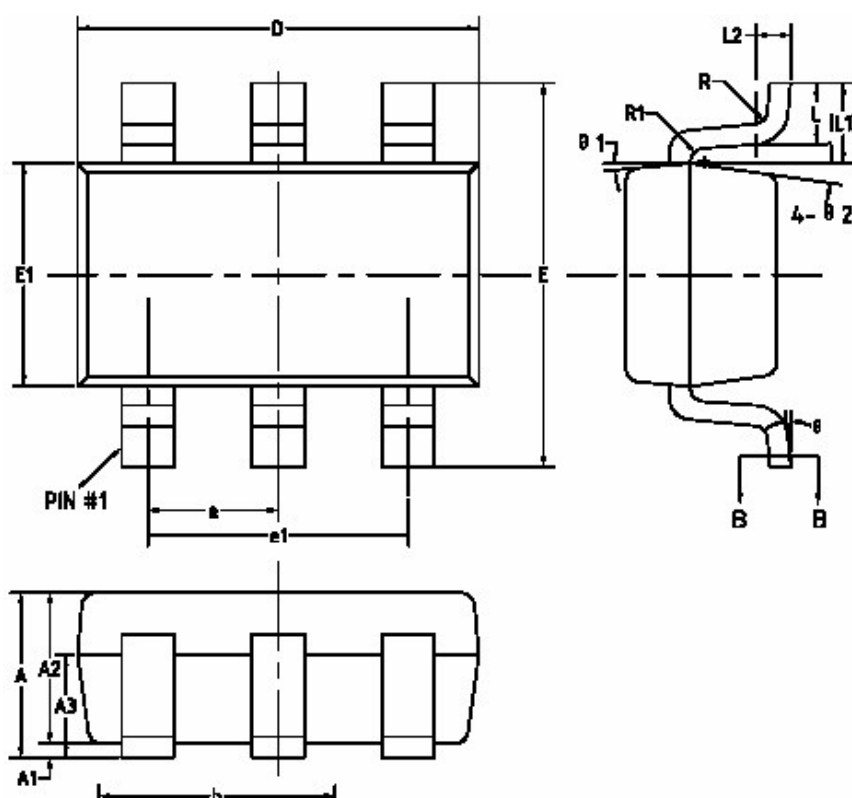


Fig. 10 On-Resistance vs. Junction Temperature

# Complementary Pair Enhancement Mode Field Effect Transistor

## BSS8402DM

SOT-23-6L



COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	—	—	1.25
A1	0	—	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.36	—	0.50
b1	0.36	0.38	0.45
c	0.14	—	0.20
c1	0.14	0.15	0.16
D	2.828	2.928	3.028
E	2.80	2.80	3.00
E1	1.528	1.626	1.726
e	0.95BSC		
e1	1.90BSC		
L	0.35	0.45	0.80
L1	0.59REF		
L2	0.25BSC		
R	0.10	—	—
R1	0.10	—	0.20
Ø	0°	—	8°
Ø 1	3°	5°	7°
Ø 2	6°	6°	10°