CB2321F P-channel and N-channel Complementary MOSFETS

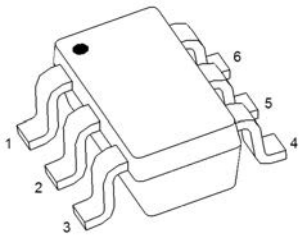
N-channel

$V_{(BR)DSS}$	$R_{DS(on)}$MAX	I_D
20V	60mΩ@4.5V	2.1A
	115mΩ@2.5V	

P-channel

$V_{(BR)DSS}$	$R_{DS(on)}$MAX	I_D
-20V	112mΩ@-4.5V	-2.3A
	142mΩ@-2.5V	

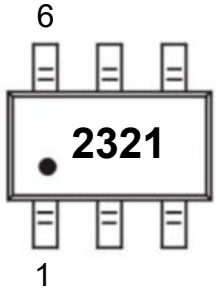
SOT-23-6L



GENERAL DESCRIPTION

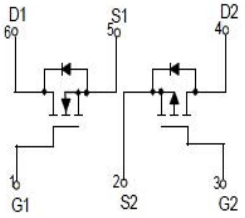
The CB2321F uses advanced trench technology to provide excellent $R_{DS(on)}$ and low gate charge. The complementary MOSFETS form a high-speed power inverter and suitable for a multitude of applications.

MARKING



2321=Device code
Solid point=Pin1 positioning point

Equivalent Circuit



Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value		Unit
		N-channel	P-channel	
Drain-Source Voltage	V_{DS}	20	-20	V
Gate-Source Voltage	V_{GS}	±8	±8	V
Continuous Drain Current	I_D	2.1	-2.3	A
Pulsed Drain Current (note 1)	I_{DM}	10	-10	A
Power Dissipation(note 2)	P_D	0.35		W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357		℃/W
Operation Junction and Storage Temperature Range	T_J,T_{stg}	-55~+150		℃

MOSFET ELECTRICAL CHARACTERISTICS

N-ch MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =10μA	20			V
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.60	0.95	1.2	
Gate-body leakage	I_{GSS}	V_{DS} =0V, V_{GS} =±8V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} =20V, V_{GS} =0V			1	μA
Drain-source on-resistance[a]	$r_{DS(on)}$	V_{GS} =4.5V, I_D =3.6A		0.045	0.060	Ω
		V_{GS} =2.5V, I_D =3.1A		0.070	0.115	
Forward transconductance[a]	g_{fs}	V_{DS} =5V, I_D =3.6A		8		S
Diode forward voltage	V_{SD}	I_S=0.94A,V_{GS}=0V		0.76	1.2	V
Dynamic						
Total gate charge	Q_g	V_{DS} =10V,V_{GS} =4.5V,I_D =3.6A		4.0	10	nC
Gate-source charge	Q_{gs}			0.65		
Gate-drain charge	Q_{gd}			1.5		
Input capacitance [b]	C_{iss}	V_{DS} =10V,V_{GS} =0V,f=1MHz		300		pF
Output capacitance [b]	C_{oss}			120		
Reverse transfer capacitance[b]	C_{rss}			80		
Switching[b]						
Turn-on delay time	$t_{d(on)}$	V_{DD}=10V, R_L=5.5Ω, I_D ≈3.6A, V_{GEN}=4.5V,Rg=6Ω		7	15	ns
Rise time	t_r			55	80	
Turn-off delay time	$t_{d(off)}$			16	60	
Fall time	t_f			10	25	

Notes :

a. Pulse Test : Pulse width≤300μs, duty cycle ≤2%.

b. These parameters have no way to verify.

MOSFET ELECTRICAL CHARACTERISTICS

P-ch MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-20			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.4		-1	
Gate-source leakage	I_{GSS}	V_{DS} =0V, V_{GS} =±8V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} =-16V, V_{GS} =0V			-1	μA
Drain-source on-state resistance [a]	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-2.8A		0.090	0.112	Ω
		V_{GS} =-2.5V, I_D =-2.0A		0.110	0.142	
Forward transconductance [a]	g_{fs}	V_{DS} =-5V, I_D =-2.8A		6.5		S
Dynamic[b]						
Input capacitance	C_{iss}	V_{DS} =-10V,V_{GS} =0V,f =1MHz		405		pF
Output capacitance	C_{oss}			75		
Reverse transfer capacitance	C_{rss}			55		
Total gate charge	Q_g	V_{DS} =-10V,V_{GS} =-4.5V,I_D =-3A		5.5	10	nC
		V_{DS} =-10V,V_{GS} =-2.5V,I_D =-3A		3.3	6	
Gate-source charge	Q_{gs}			0.7		
Gate-drain charge	Q_{gd}			1.3		
Gate resistance	R_g	f =1MHz		6.0		Ω
Turn-on delay time	$t_{d(on)}$	V_{DD}=-10V, R_L=10Ω, I_D =-1A, V_{GEN}=-4.5V,Rg=1Ω		11	20	ns
Rise time	t_r			35	60	
Turn-off delay time	$t_{d(off)}$			30	50	
Fall time	t_f			10	20	
Drain-source body diode characteristics						
Continuous source-drain diode current	I_S	T_C=25℃			-1.3	A
Pulse diode forward current [a]	I_{SM}				-10	
Body diode voltage	V_{SD}	I_S=-0.7A		-0.8	-1.2	V

Notes :

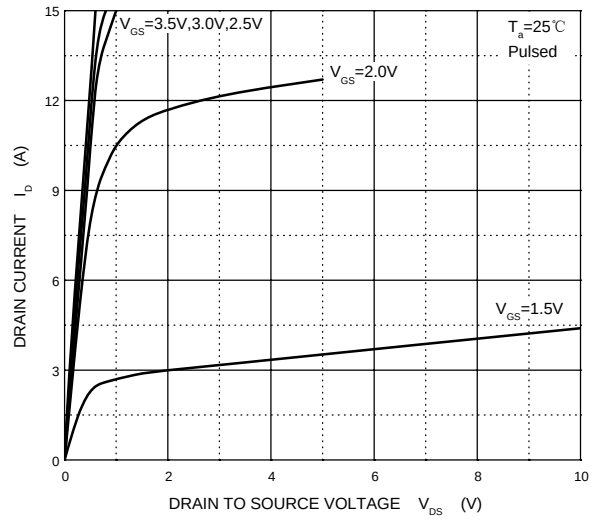
a.Pulse Test : Pulse Width < 300μs, Duty Cycle ≤2%.

b.Guaranteed by design, not subject to production testing.

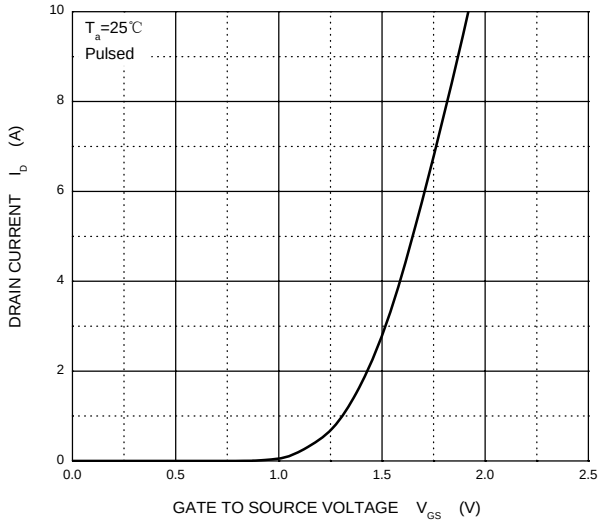
Typical Characteristics

N-Channel MOS

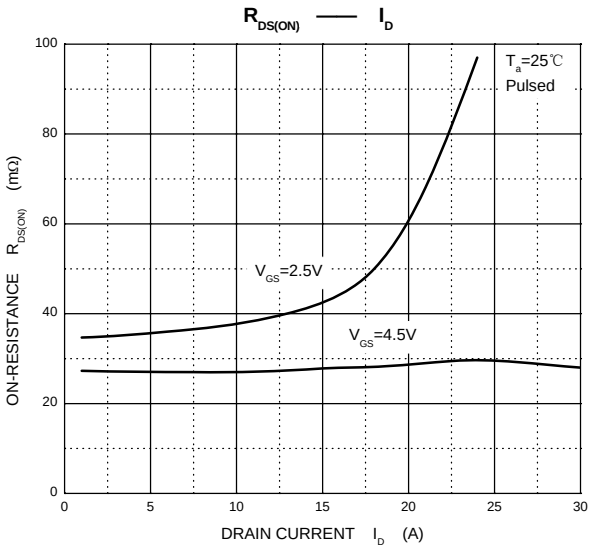
Output Characteristics



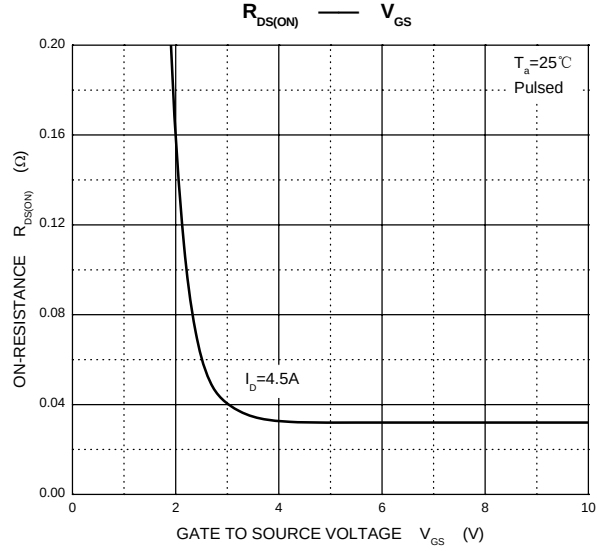
Transfer Characteristics



$R_{DS(ON)}$ — I_D



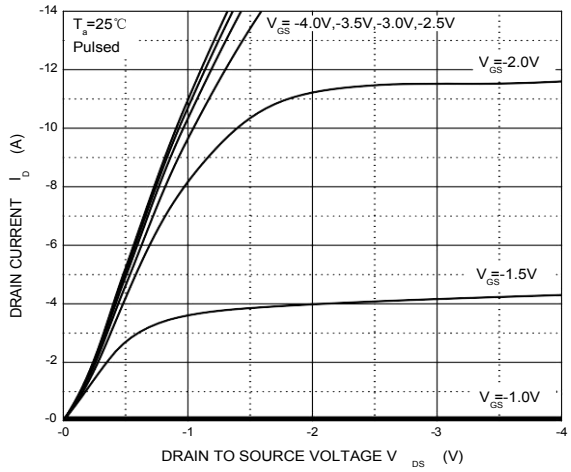
$R_{DS(ON)}$ — V_{GS}



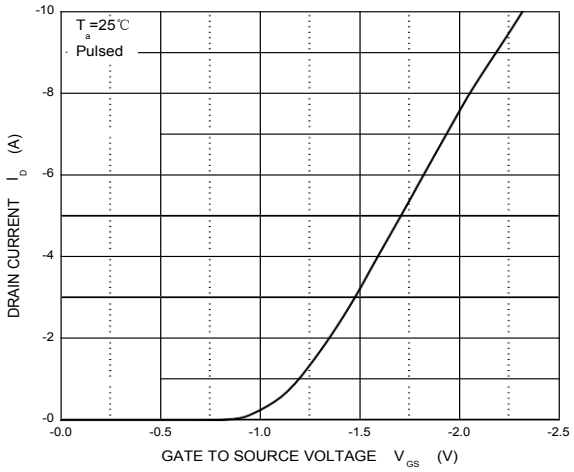
Typical Characteristics

P-Channel MOS

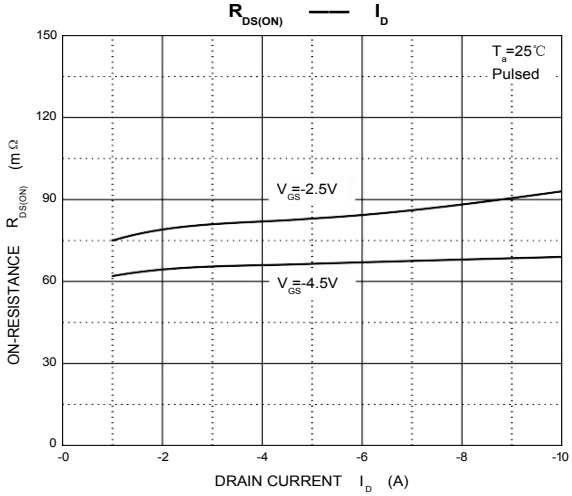
Output Characteristics



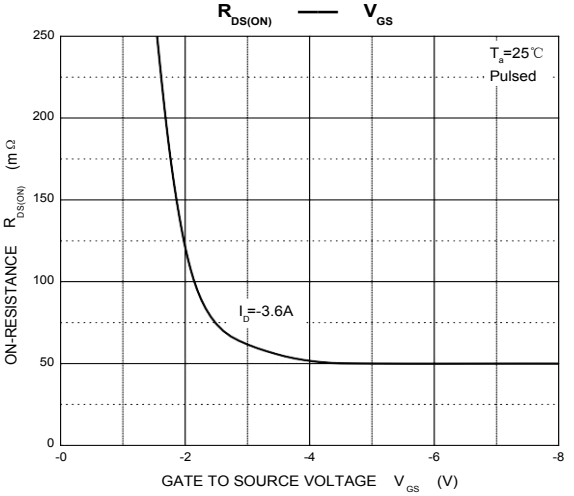
Transfer Characteristics



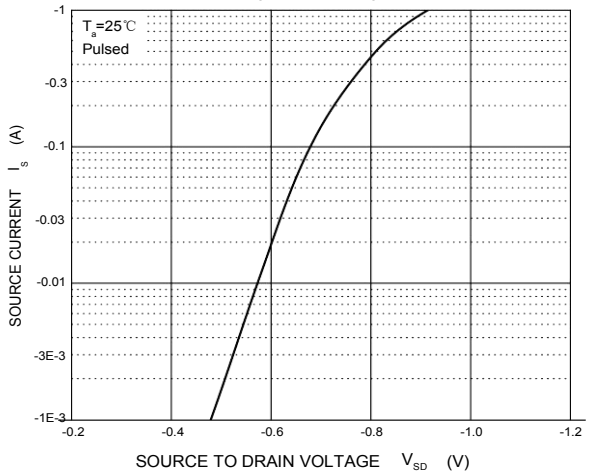
$R_{DS(ON)}$ —— I_D



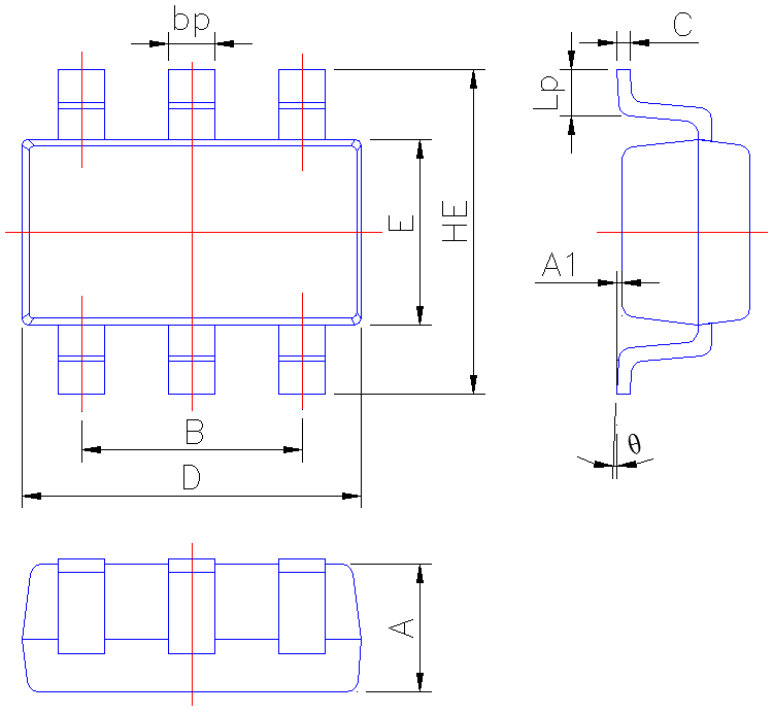
$R_{DS(ON)}$ —— V_{GS}



I_S —— V_{SD}



SOT-23-6L-Package Outline Dimensions



Symbol	Dimension in Millimeters	
	Min	Max
A	1.05	1.20
A1	0.010	0.100
B	1.80	2.00
bp	0.35	0.50
C	0.09	0.15
D	2.80	3.00
E	1.50	1.70
HE	2.60	3.00
Lp	0.25	0.55
θ	2°	6°