

SOT-23 Plastic-Encapsulate MOSFETS

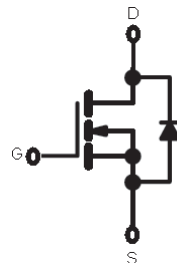
BC2306 N-Channel 30-V(D-S) MOSFET

FEATURE

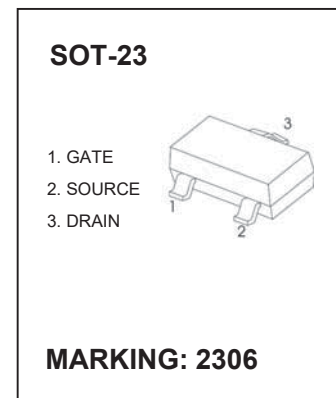
TrenchFET Power MOSFET

APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter



Equivalent Circuit



Maximum ratings (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J=150^{\circ}\text{C}$)	I_D	3.16	A
Pulsed Drain Current	I_{DM}	20	
Continuous Source Current(Diode Conduction)	I_S	0.62	
Maximum Power Dissipation ^{a,b}	P_D	0.75	W
Thermal Resistance from Junction to Ambient ($t \leq 5\text{s}$)	$R_{\theta JA}$	167	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^{\circ}\text{C}$

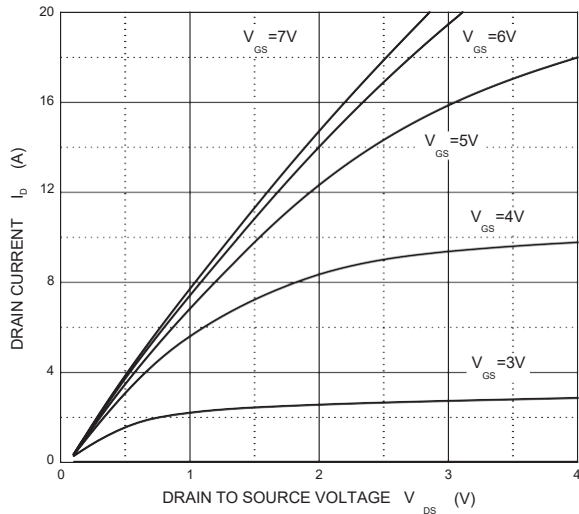
Electrical characteristics ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0		3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$			0.5	μA
Drain-Source On-Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 3.5A$		0.038	0.047	Ω
		$V_{GS} = 4.5V, I_D = 2.8A$		0.052	0.065	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 4.5V, I_D = 2.5A$		7.0		S
Diode Forward Voltage	V_{SD}	$I_S = 1.25A, V_{GS} = 0V$		0.8	1.2	V
Dynamic						
Gate Charge	Q_g	$V_{DS} = 15V, V_{GS} = 5V, I_D = 2.5A$		3.0	4	nC
Total Gate Charge	Q_{gt}	$V_{DS} = 15V, V_{GS} = 10V, I_D = 2.5A$		6	9	
Gate-Source Charge	Q_{gs}			1.6		
Gate-Drain Charge	Q_{gd}			0.6		
Gate Resistance	R_g	$f = 1.0\text{MHz}$	2.5	5	7.5	Ω
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1\text{MHz}$		305		pF
Output Capacitance	C_{oss}			65		
Reverse Transfer Capacitance	C_{rss}			29		
Switching						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15V,$ $R_L = 15\Omega, I_D \approx 1A,$ $V_{GEN} = 10V, R_g = 6\Omega$		7	11	ns
Rise Time	t_r			12	18	
Turn-Off Delay Time	$t_{d(off)}$			14	25	
Fall Time	t_f			6	10	

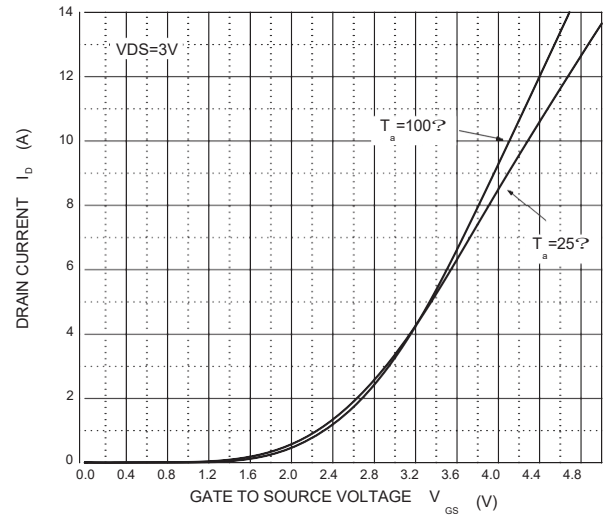
Notes :a. Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Typical Characteristics

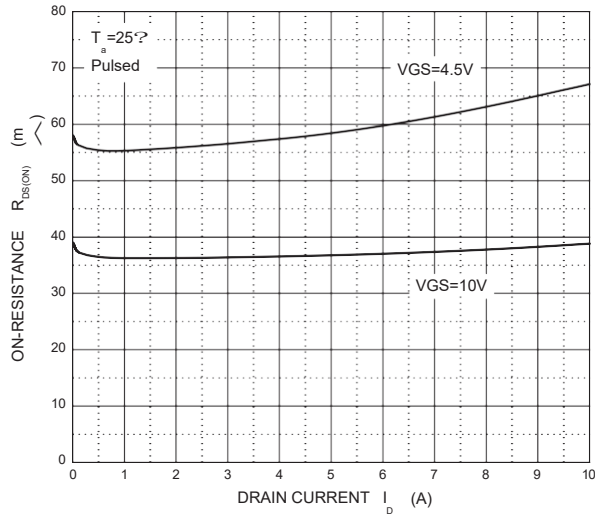
Output Characteristics



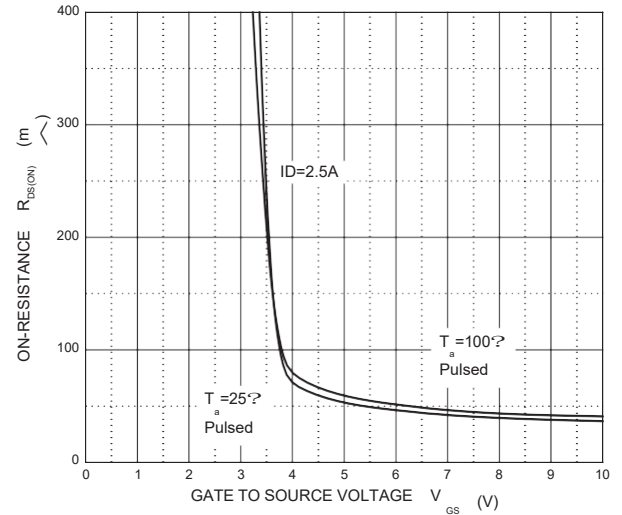
Transfer Characteristics



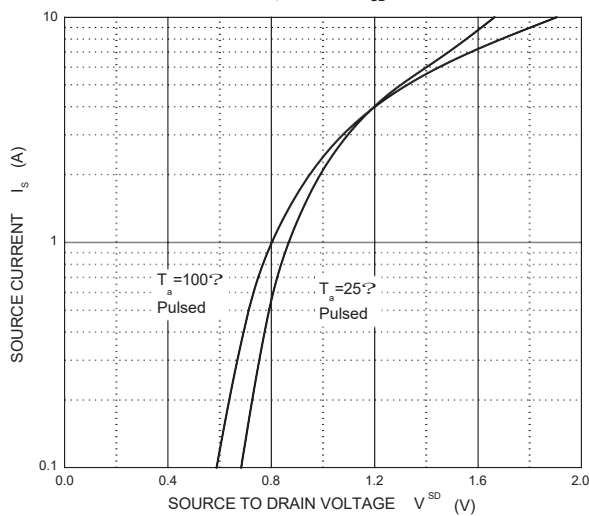
$R_{DS(ON)}$ — I_D



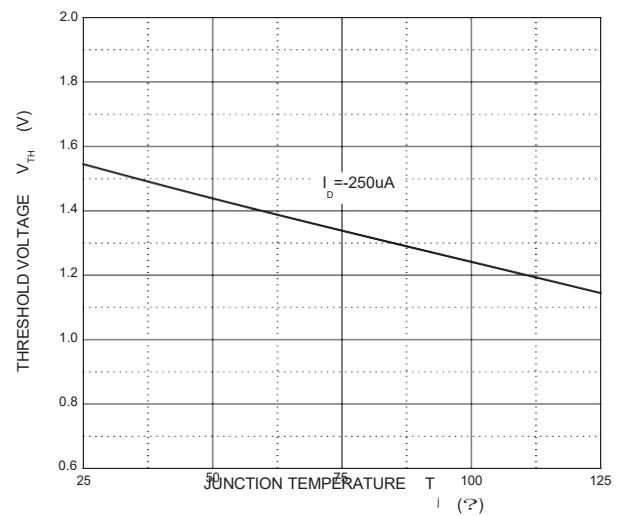
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



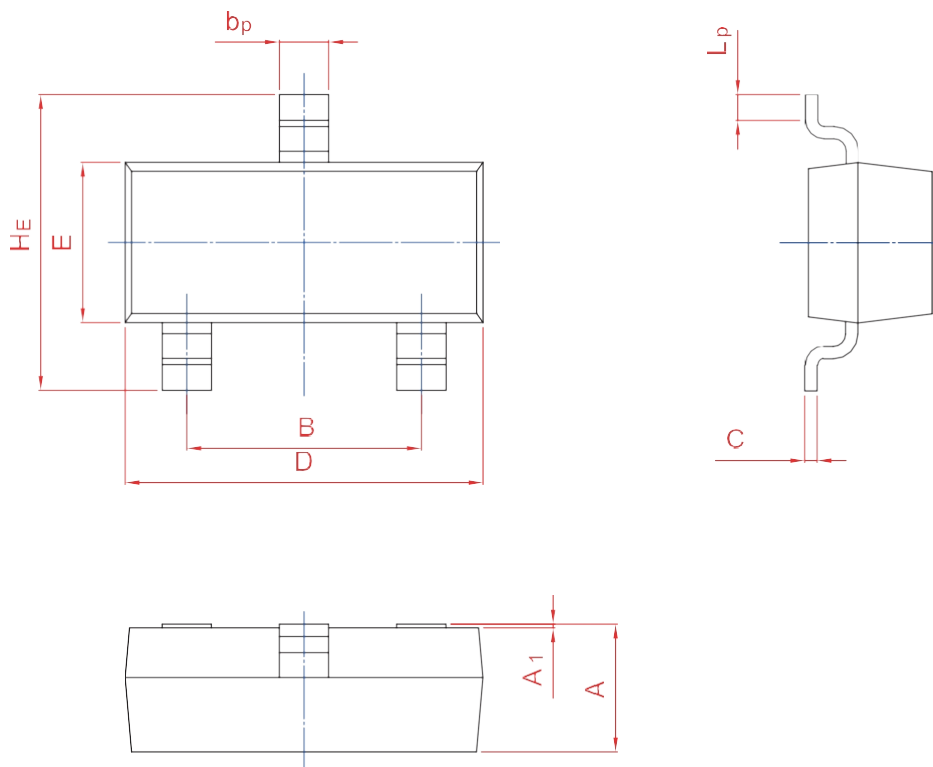
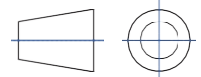
Threshold Voltage



PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	bp	C	D	E	HE	A1	Lp
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20