

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-60V	4.2Ω@-10V	-0.13A
	4.5Ω@-4.5V	

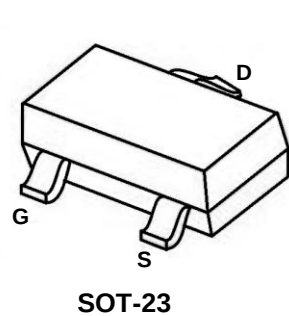
Feature

- Energy Efficient
- Low Threshold Voltage
- High-speed Switching
- ESD Protected

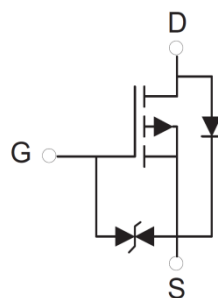
Application

- DC-DC converters
- load switching
- power management in portable
- battery-powered products

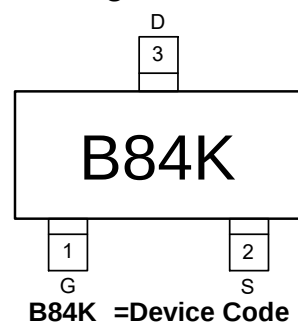
Package



Circuit diagram



Marking



**Absolute maximum ratings (Ta=25°C unless otherwise noted)**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	-0.13	A
Pulsed Drain Current @ $t_p < 10\mu s$	I_{DM}	-0.52	A
Power Dissipation	P_D	225	mW
Thermal Resistance from Junction to Ambient ⁽²⁾	$R_{\theta JA}$	556	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55~ +150	°C

Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-60			V
Drain Leakage Current	I_{DSS}	$V_{DS} = -48V, V_{GS} = 0V$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 10	μA
Gate threshold voltage ³⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.8	-1.5	-2.5	V
Drain-source on-resistance ³⁾	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -0.15A$		4.2	6	Ω
		$V_{GS} = -4.5V, I_D = -0.15A$		4.5	7	
Dynamic characteristics ⁴⁾						
Input Capacitance	C_{iss}	$V_{DS} = -5V, V_{GS} = 0V, f = 1MHz$		30		pF
Output Capacitance	C_{oss}			10		
Reverse Transfer Capacitance	C_{rss}			5		
Switching characteristics ⁴⁾						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -15V, R_L = 50\Omega, I_D = -2.5A$		2.5		ns
Turn-on rise time	t_r			1		
Turn-off delay time	$t_{d(off)}$			16		
Turn-off fall time	t_f			8		
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	$V_{GS} = 0V, I_S = -0.5A$			-1.3	V

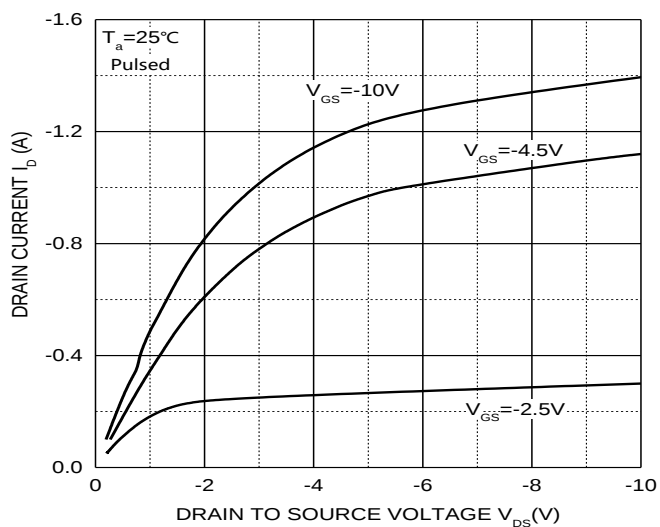
Notes:

1. Repetitive rating: Pulse width limited by junction temperature.
2. Surface mounted on FR4 board, $t \leq 10s$.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production.

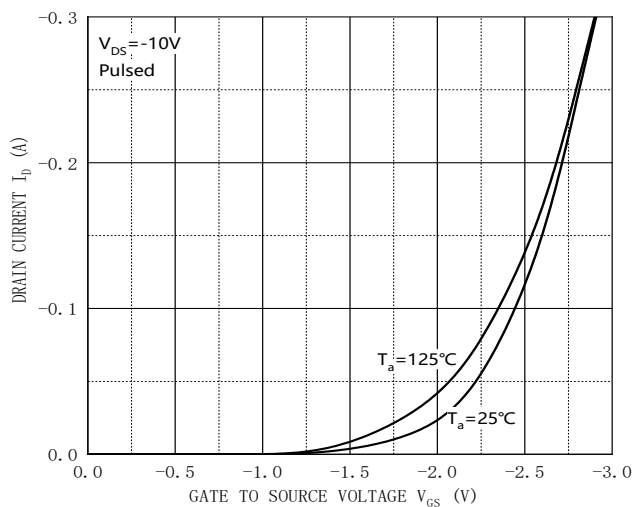


Typical Characteristics

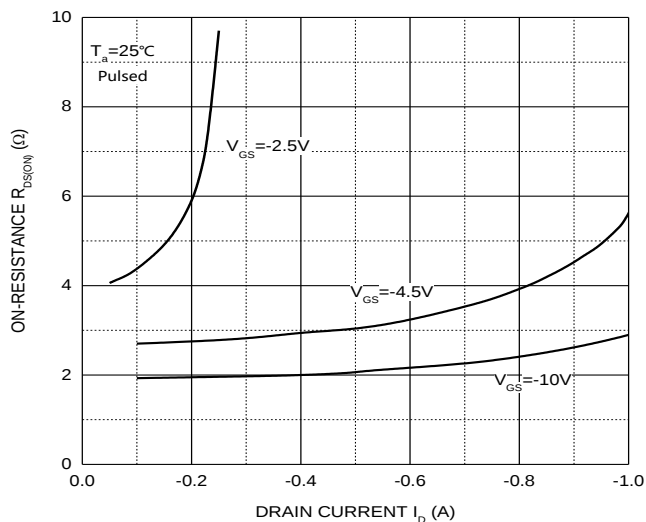
Output Characteristics



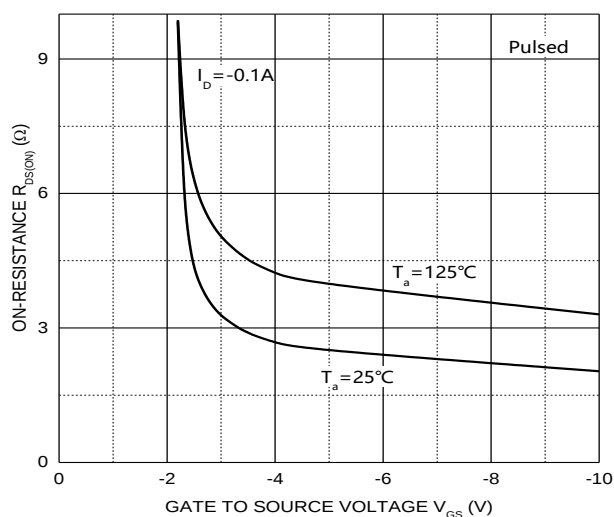
Transfer Characteristics



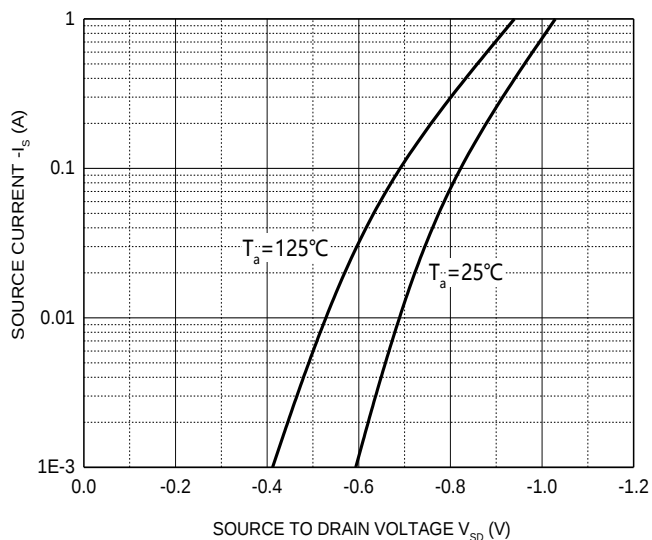
$R_{DS(ON)}$ VS. I_D



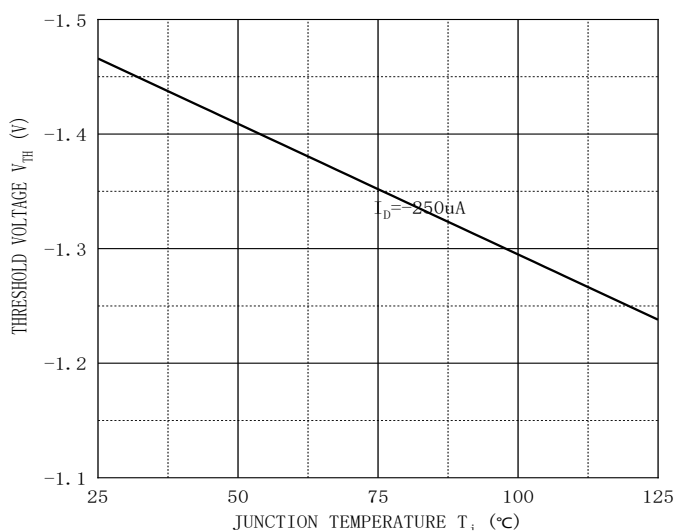
$R_{DS(ON)}$ VS. V_{GS}



I_S VS. V_{SD}

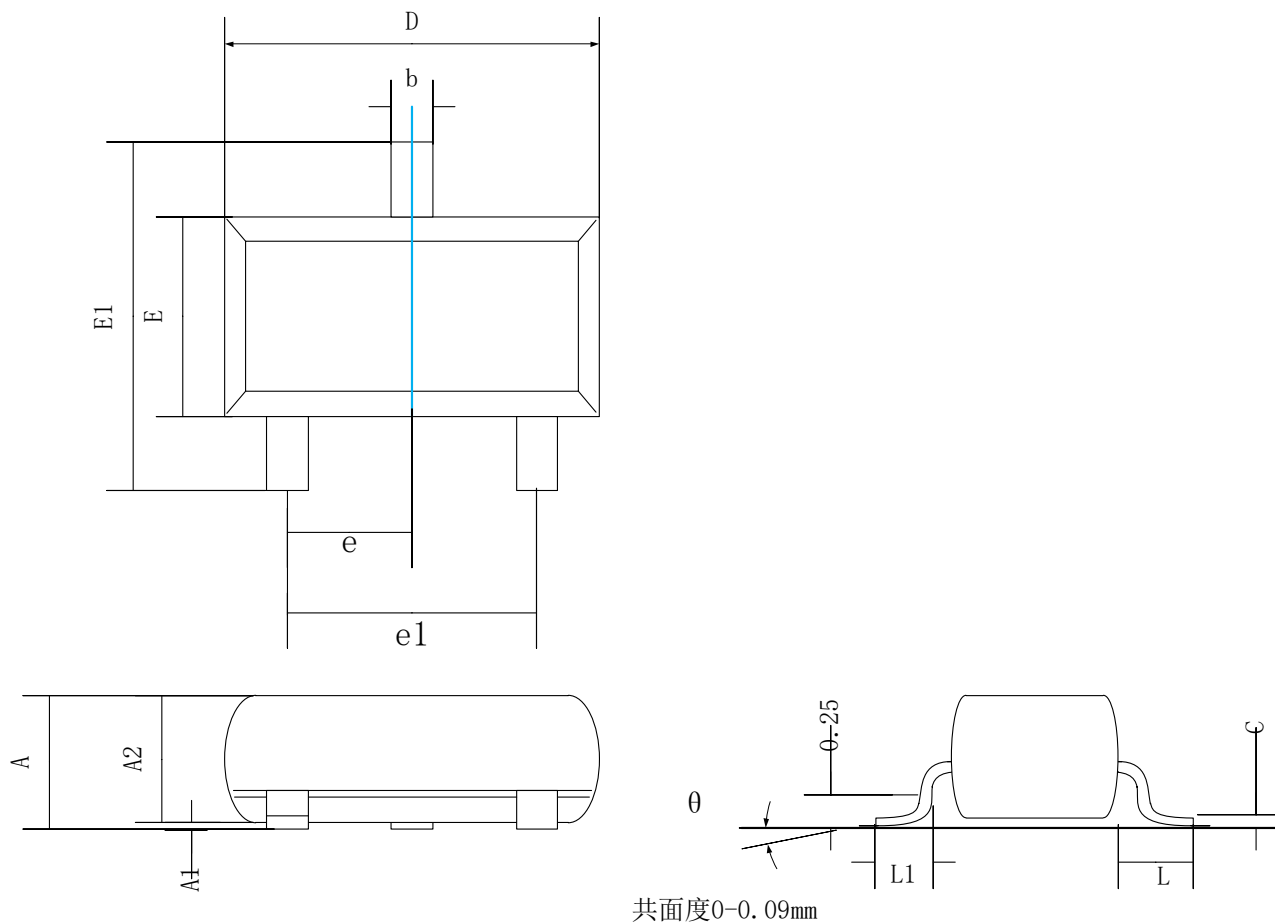


Threshold Voltage





SOT-23 Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	0.90	1.15
A1	0.00	0.10
A2	0.90	1.05
b	0.30	0.50
c	0.08	0.15
D	2.80	3.00
E	1.20	1.40
E1	2.25	2.55
e	0.95 REF.	
e1	1.80	2.00
L	0.55 REF.	
L1	0.30	0.50
θ	0°	8°