

Description

This -30V -4.2A P-Channel MOSFET in a SOT23-3 Plastic Package.

Applications

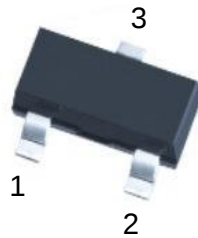
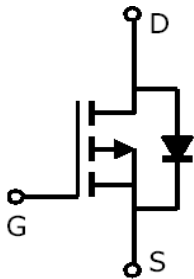
This device is suitable for use as a load switch or in PWM applications.

Features

- $V_{DS} (V) = -30V$
- $I_D = -4.2 A (V_{GS} = -10V)$
- $R_{DS(ON)} < 60m\Omega (V_{GS} = -10V)$
- $R_{DS(ON)} < 65m\Omega (V_{GS} = -4.5V)$
- $R_{DS(ON)} < 120m\Omega (V_{GS} = -2.5V)$
- Halogen free product. •

V_{DSS}	$R_{DS(on)}$ Typ	I_D
-30V	52m Ω	-4.2A

Equivalent Circuit & Pinning



PIN1: Gate PIN 2: Source PIN 3: Drain

Marking

Marking	B1H
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Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Drain Current – Continuous	I_D	-4.2	A
Drain Current- Continuous ^A	$I_D(T_a=70^{\circ}\text{C})$	-3.5	A
Pulsed Drain Current ^B	I_{DM}	-30	A
Gate-Source Voltage	V_{GS}	± 12	V
Total Power Dissipation ^A	P_D	1.4	W
Total Power Dissipation ^A	$P_D(T_a=70^{\circ}\text{C})$	1.0	W
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to 150	°C
Maximum Junction-to-Ambient ^A	$R_{\theta JA}(T_a=70^{\circ}\text{C})$	125	°C/W
Maximum Junction-to-Lead ^C	$R_{\theta JL}$	60	°C/W

Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V$ $V_{GS}=0V$			-1	μA
		$V_{DS}=-24V$ $V_{GS}=0V$ $T_J=55^{\circ}\text{C}$			-5	μA
Gate–Body Leakage.	I_{GSS}	$V_{GS}=\pm 12V$ $V_{DS}=0V$			± 0.1	μA
On–State Drain Current	$I_{D(on)}$	$V_{GS}=-4.5V$ $V_{DS}=-5V$	-25			A
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-0.7	-1	-1.3	V
Static Drain–Source On–Resistance	$R_{DS(on)(1)}$	$V_{GS}=-10V$ $I_D=-4.2A$		52	60	m Ω
	$R_{DS(on)(2)}$	$V_{GS}=-10V$ $I_D=-4.2A$ $T_J=125^{\circ}\text{C}$			75	
	$R_{DS(on)(3)}$	$V_{GS}=-4.5V$ $I_D=-4A$		60	65	
	$R_{DS(on)(4)}$	$V_{GS}=-2.5V$ $I_D=-1A$		75	120	
Forward Transconductance	g_{FS}	$V_{DS}=-5V$ $I_D=-5A$	4	8		S
Drain–Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=-1A$		-0.75	-1.0	V

Electrical Characteristics($T_a=25^{\circ}\text{C}$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Capacitance	C_{iss}	$V_{DS}=-15\text{V}$ $V_{GS}=0\text{V}$ $f=1\text{MHz}$		957		pF
Output Capacitance	C_{oss}			115		
Reverse Transfer Capacitance	C_{rss}			77		
Gate resistance	R_g	$V_{GS}=0\text{V}$ $V_{DS}=0\text{V}$, $f=1\text{MHz}$		6		Ω
Total Gate Charge	Q_g	$V_{GS}=-4.5\text{V}$ $V_{DS}=-15\text{V}$ $I_D=-4\text{A}$		9.4		nC
Gate Source Charge	Q_{gs}			2		
Gate Drain Charge	Q_{gd}			3		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-10\text{V}$ $R_L=3.6\Omega$ $V_{DS}=-15\text{V}$ $R_{GEN}=6\Omega$		6.3		ns
Turn-On Rise Time	t_r			3.2		
Turn-Off Delay Time	$t_{d(off)}$			38.2		
Turn-Off Fall Time	t_f			12		
Body Diode Reverse Recovery Time	t_{rr}	$I_F=-4\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$		20.2		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=-4\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$		11.2		nC

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The value in any given application depends on the user's specific board design. The current rating is based on the $t \leq 10\text{s}$ thermal resistance rating.

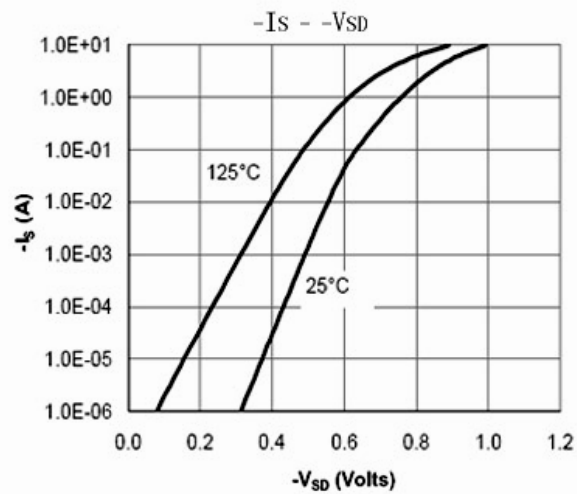
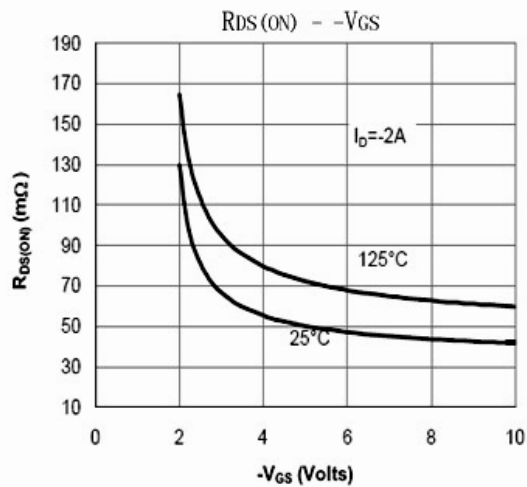
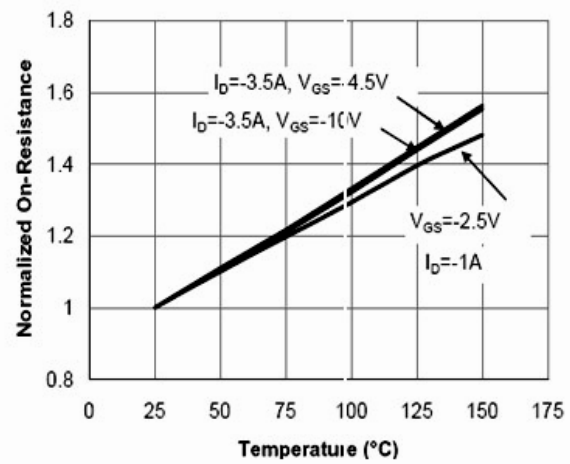
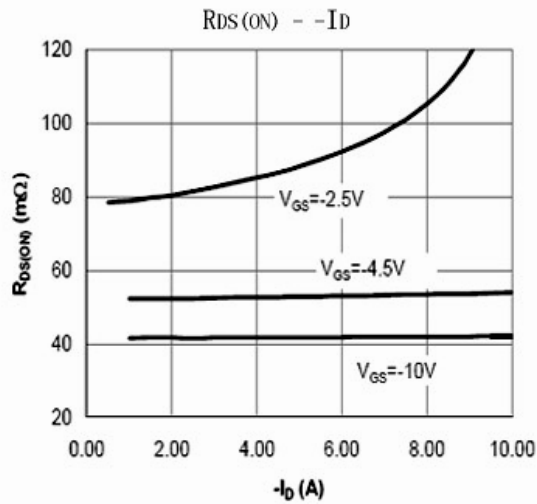
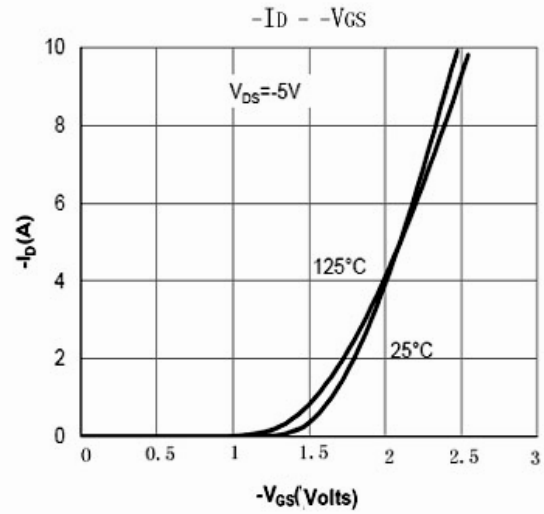
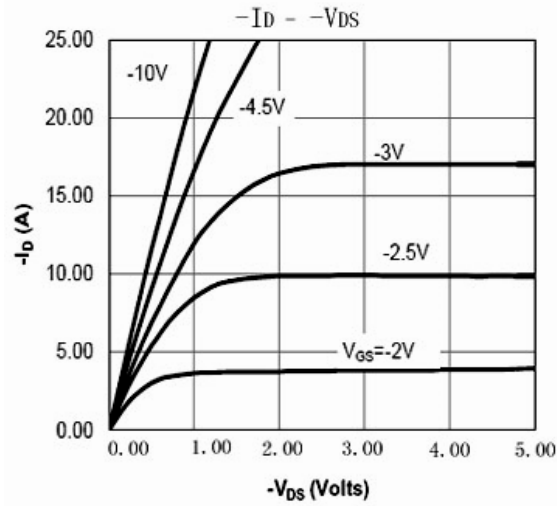
B: Repetitive rating, pulse width limited by junction temperature.

C: The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.

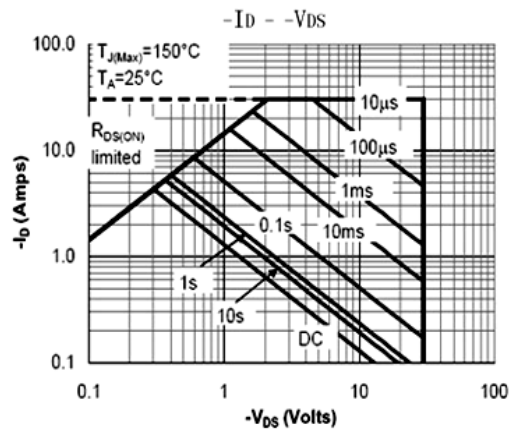
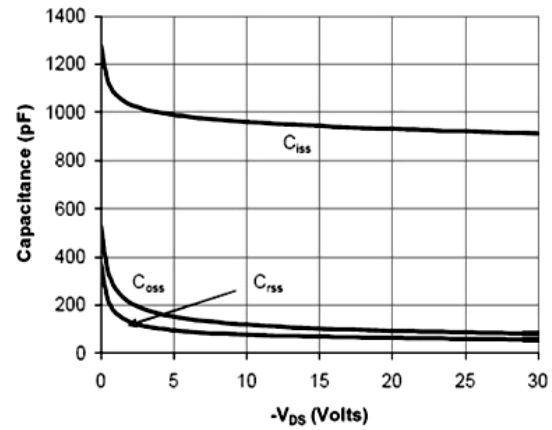
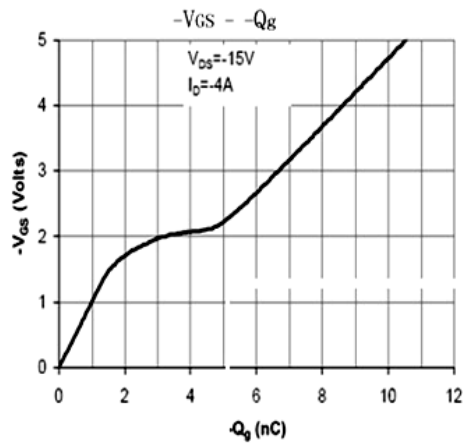
D: The static characteristics in Figures 1 to 6,12,14 are obtained using $80\mu\text{s}$ pulses, duty cycle 0.5% max.

E: These tests are performed with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The SOA curve provides a single pulse rating.

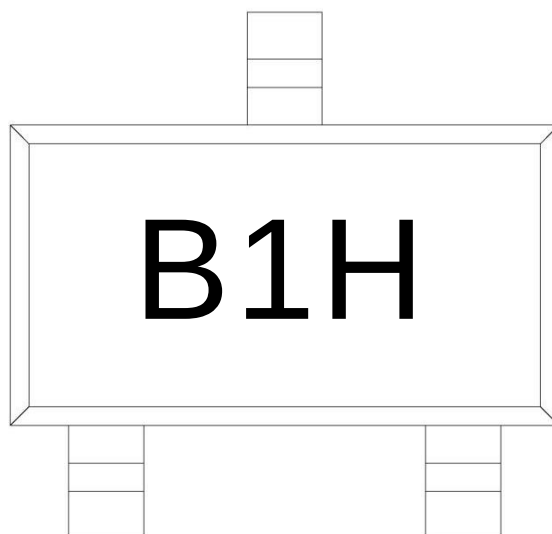
Electrical Characteristic Curve



Electrical Characteristic Curve



Marking Instructions



Note:

B1: Product Type Code.

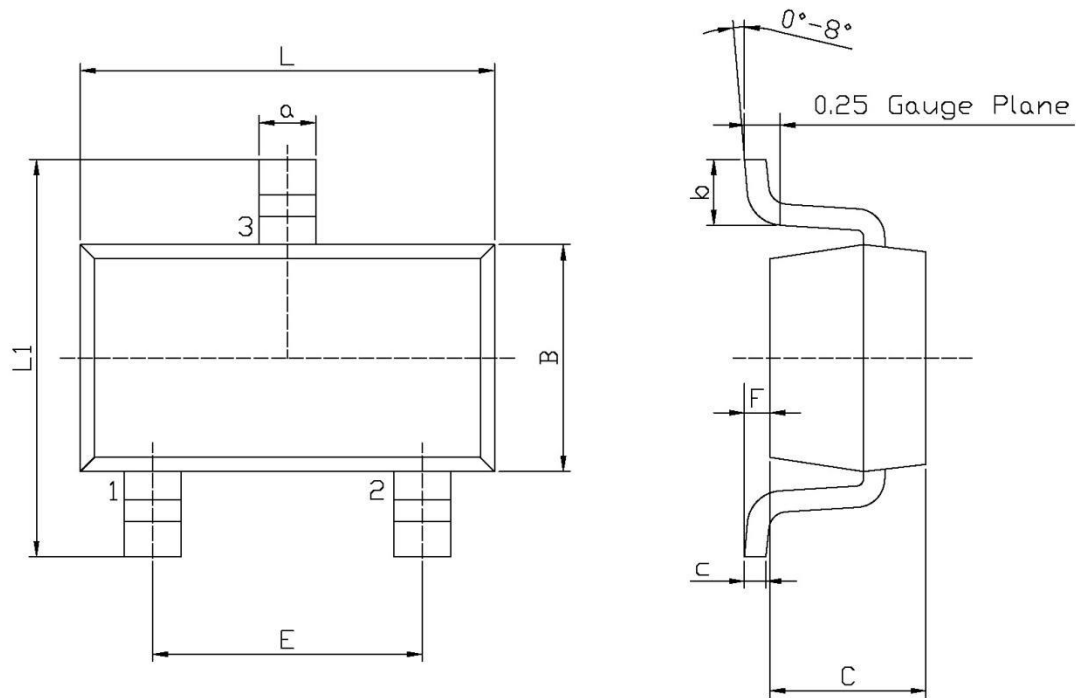
H: Company Code.

Packaging SPEC.

REEL INFORMATION

Package Type	Units					Dimension (unit: mm ³)		
	Units/Reel	Reels/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Reel	Inner Box	Outer Box
SOT23-3	3,000	10	30,000	4	120,000	7" x8	210×205×205	445×230×435

Package Outline Dimensions



Unit: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.82	3.02	a	0.35	0.50
B	1.50	1.70	c	0.10	0.20
C	0.90	1.30	b	0.35	0.55
L1	2.60	3.00	F	0	0.15
E	1.80	2.00			

SOT23-3