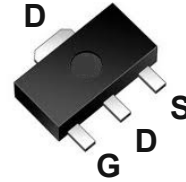


BVDSS	RDSON	ID
-30V	51mΩ	-5.0A

SOT89 Pin Configuration

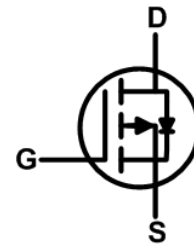


## Features

- -30V, -5.0A,  $R_{DS(ON)} = 51m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available

## Applications

- Notebook
- Load Switch
- Battery Protection
- Hand-Held Instruments



## Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D$	Drain Current – Continuous ( $T_A=25^\circ\text{C}$ )	-5.0	A
	Drain Current – Continuous ( $T_A=70^\circ\text{C}$ )	-3.0	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	-15.4	A
$P_D$	Power Dissipation ( $T_A=25^\circ\text{C}$ )	1.56	W
	Power Dissipation – Derate above $25^\circ\text{C}$	0.012	W/ $^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

## Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	80	$^\circ\text{C/W}$

## Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)

### Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-30	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =-1mA	---	-0.03	---	V/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	-1	uA
		V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	---	---	-10	uA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	---	---	±100	nA

### On Characteristics

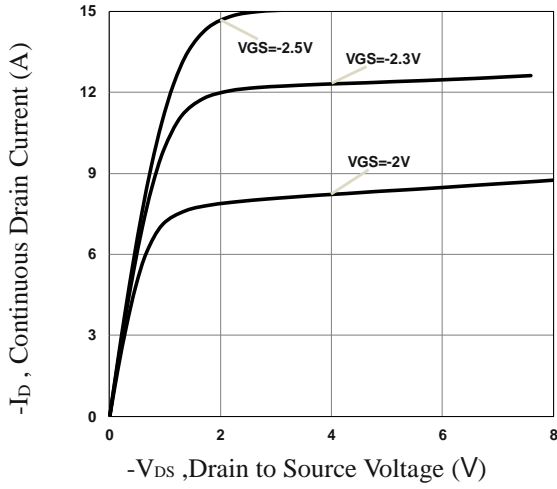
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-4A	---	51	65	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3A	---	65	80	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2A	---	85	100	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-0.4	-0.8	-1.3	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	3	---	mV/°C
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-3A	---	5.4	---	S

### Dynamic and switching Characteristics

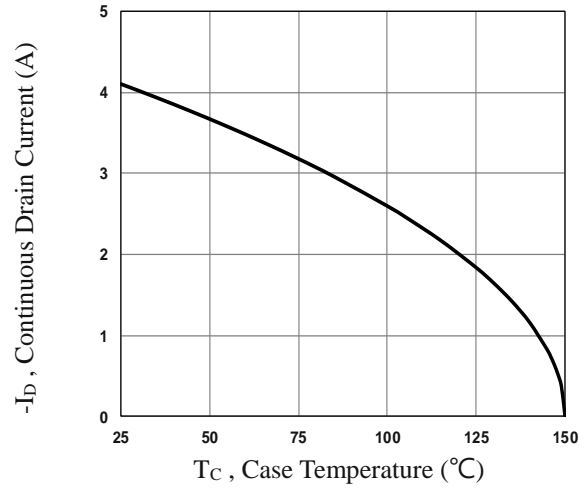
Q <sub>g</sub>	Total Gate Charge <sup>2,3</sup>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A	---	8	---	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>2,3</sup>		---	1.9	---	
Q <sub>gd</sub>	Gate-Drain Charge <sup>2,3</sup>		---	1.4	---	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>2,3</sup>	V <sub>DD</sub> =-15V, V <sub>GS</sub> =-10V, R <sub>G</sub> =6Ω I <sub>D</sub> =-1A	---	5.4	---	ns
T <sub>r</sub>	Rise Time <sup>2,3</sup>		---	19.4	---	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>2,3</sup>		---	45.9	---	
T <sub>f</sub>	Fall Time <sup>2,3</sup>		---	12.4	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, F=1MHz	---	810	---	pF
C <sub>oss</sub>	Output Capacitance		---	85	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	50	---	

### Drain-Source Diode Characteristics and Maximum Ratings

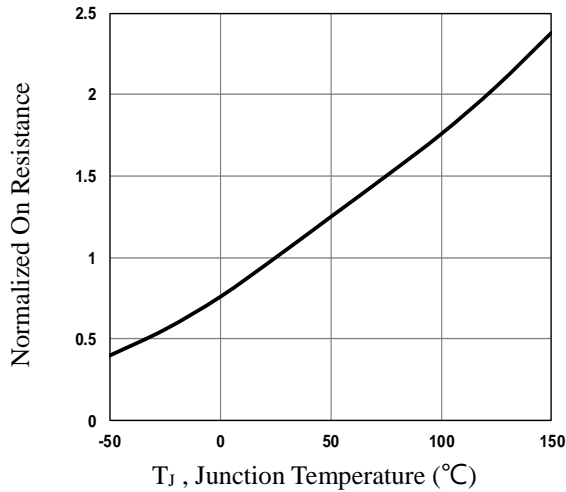
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	-5.0	A
I <sub>SM</sub>	Pulsed Source Current		---	---	-15.4	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, T <sub>J</sub> =25°C	---	---	-1.3	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>R</sub> =-30V, I <sub>S</sub> =-2A	---	115	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs, T <sub>J</sub> =25°C	---	150	---	nC



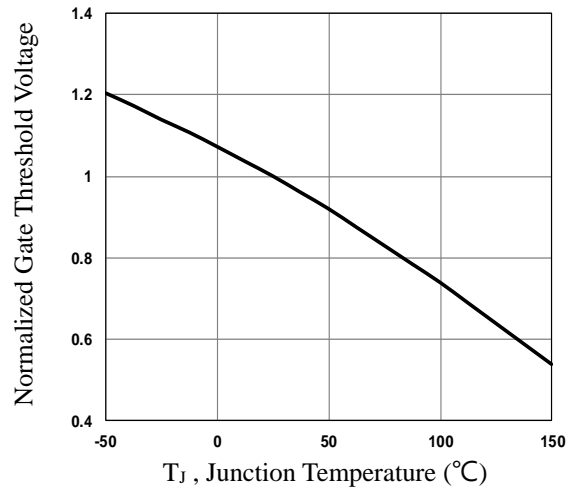
**Fig.1 Typical Output Characteristics**



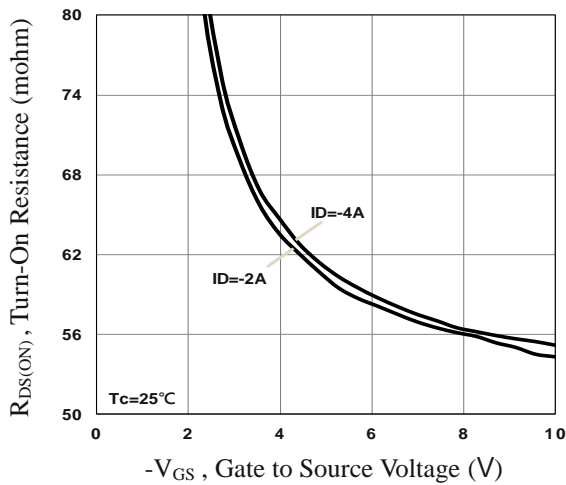
**Fig.2 Continuous Drain Current vs.  $T_c$**



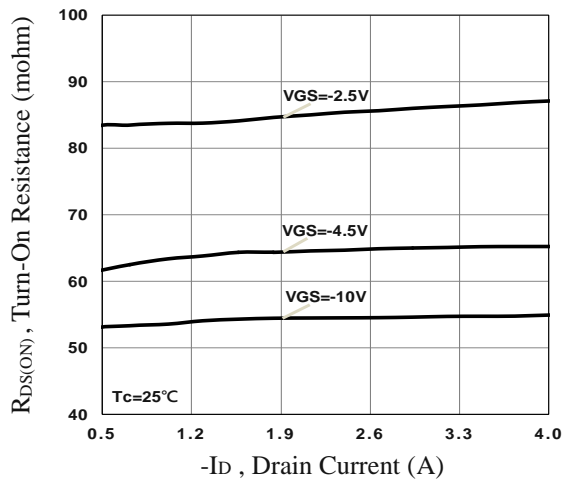
**Fig.3 Normalized  $R_{DS(on)}$  vs.  $T_j$**



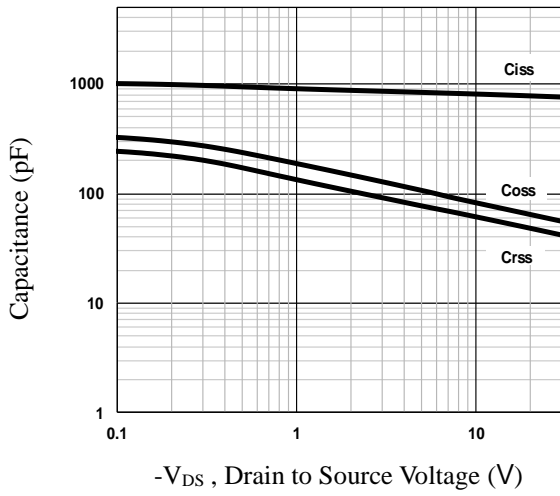
**Fig.4 Normalized  $V_{th}$  vs.  $T_j$**



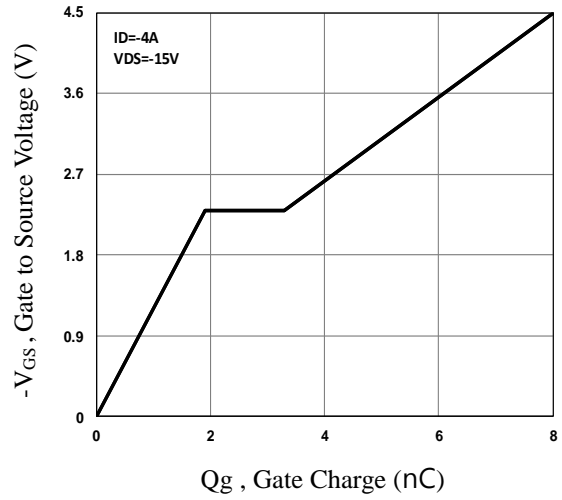
**Fig.5 Turn-On Resistance vs.  $V_{GS}$**



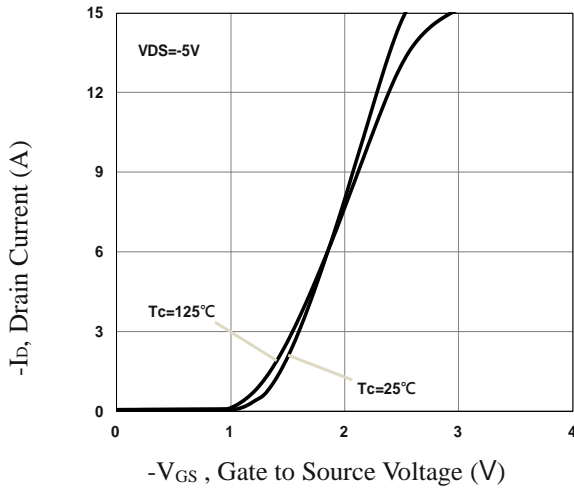
**Fig.6 Turn-On Resistance vs.  $I_D$**



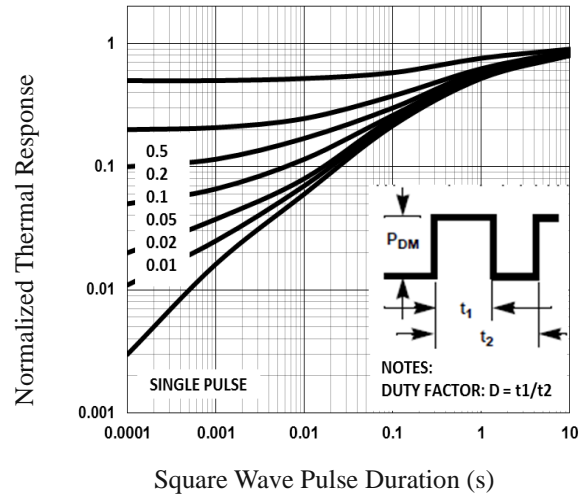
**Fig.7 Capacitance Characteristics**



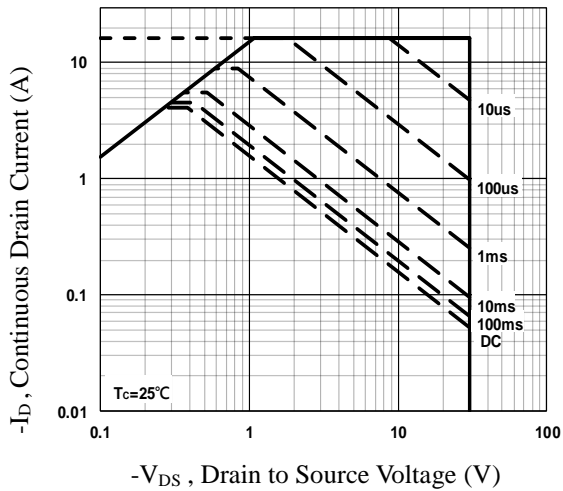
**Fig.8 Gate Charge Characteristics**



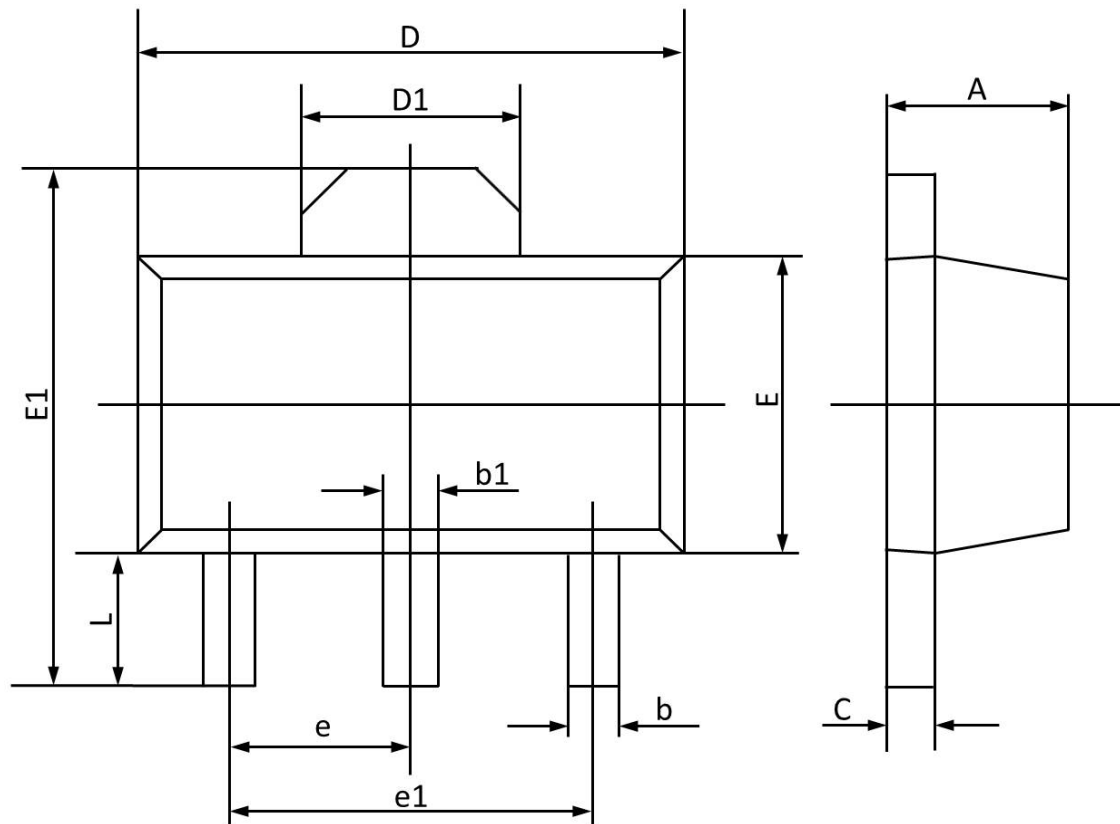
**Fig.9 Transfer Characteristics**



**Fig.10 Normalized Transient Impedance**



## SOT89 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047