

SOT-89 Plastic-Encapsulate Transistors

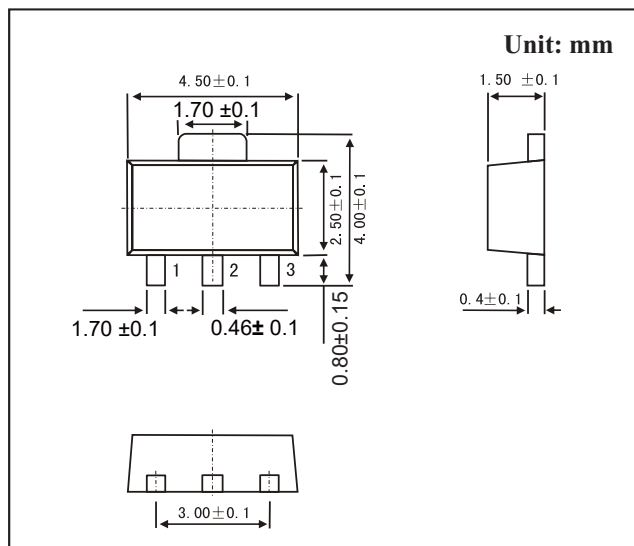
BVDSS	RDS(on)	ID
100V	350mΩ	3A

Features

- 100V, 3A, $R_{DS(ON)}=350m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- Networking
- Load Switch
- LED applications



MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current – Continuous ($T_C=25^\circ C$)	I_D	3	A
Drain Current – Continuous ($T_C=100^\circ C$)		1.9	A
Drain Current – Pulsed ¹	I_{DM}	12	A
Single Pulse Avalanche Energy ²	EAS	6	mJ
Single Pulse Avalanche Current ²	IAS	11	A
Power Dissipation ($T_C=25^\circ C$)	P_D	6.9	W
Power Dissipation – Derate above 25°C		0.06	W/°C
Storage Temperature Range	T_{STG}	-50 to 150	°C
Operating Junction Temperature Range	T_J	-50 to 150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to ambient	$R_{\theta JA}$	---	80	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	18	°C/W

MOSFET ELECTRICAL CHARACTERISTICS $T_A=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^{\circ}\text{C}, I_D=1\text{mA}$	---	0.09	---	$\text{V}/^{\circ}\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	---	---	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2A$	---	280	350	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=1A$	---	290	360	$\text{m}\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.8	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	-4.4	---	$\text{mV}/^{\circ}\text{C}$
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=2A$	---	3	---	S

Dynamic and switching Characteristics

Total Gate Charge ^{3, 4}	Q_g	$V_{DS}=50V, V_{GS}=10V, I_D=1A$	---	5.8	11	nC
Gate-Source Charge ^{3, 4}	Q_{gs}		---	0.7	3	
Gate-Drain Charge ^{3, 4}	Q_{gd}		---	2.5	5	
Turn-On Delay Time ^{3, 4}	$T_{d(on)}$	$V_{DD}=50V, V_{GS}=10V, R_G=3.3\Omega, I_D=1A$	---	5.2	10	ns
Rise Time ^{3, 4}	T_r		---	6.8	12	
Turn-Off Delay Time ^{3, 4}	$T_{d(off)}$		---	14.5	28	
Fall Time ^{3, 4}	T_f	$V_{DS}=50V, V_{GS}=0V, F=1\text{MHz}$	---	2.1	5	pF
Input Capacitance	C_{iss}		---	480	960	
Output Capacitance	C_{oss}		---	25	50	
Reverse Transfer Capacitance	C_{rss}	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	14	28	Ω
Gate resistance	R_g		---	2	4	

Drain-Source Diode Characteristics and Maximum Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	---	---	3	A
Pulsed Source Current	I_{SM}		---	---	6	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	---	---	1	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=1A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	70	---	ns
Reverse Recovery Charge	Q_{rr}		---	114	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=11A, R_G=25\Omega, \text{Starting } T_J=25^{\circ}\text{C}.$
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

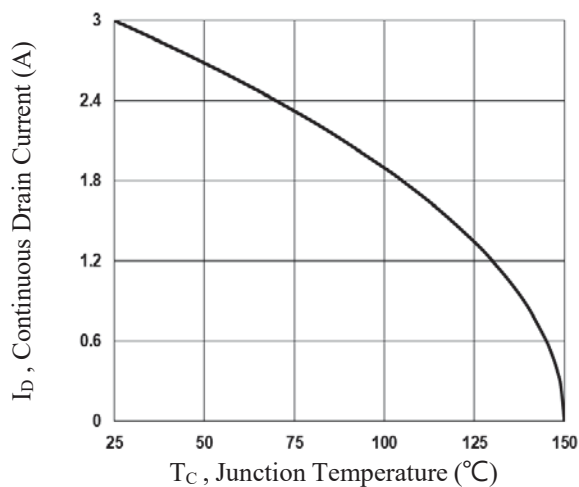


Fig.1 Continuous Drain Current vs. T_C

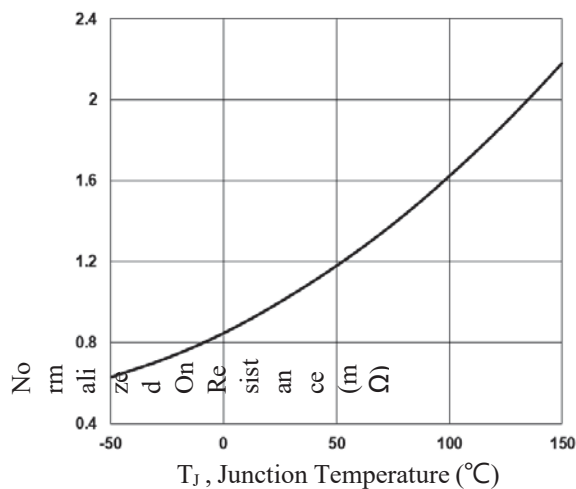


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

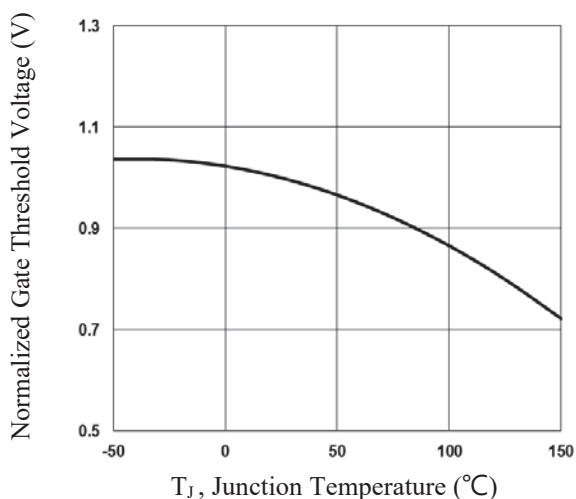


Fig.3 Normalized V_{th} vs. T_J

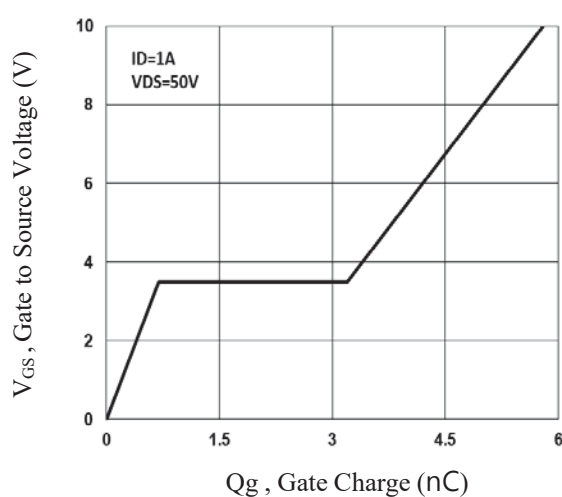


Fig.4 Gate Charge Waveform

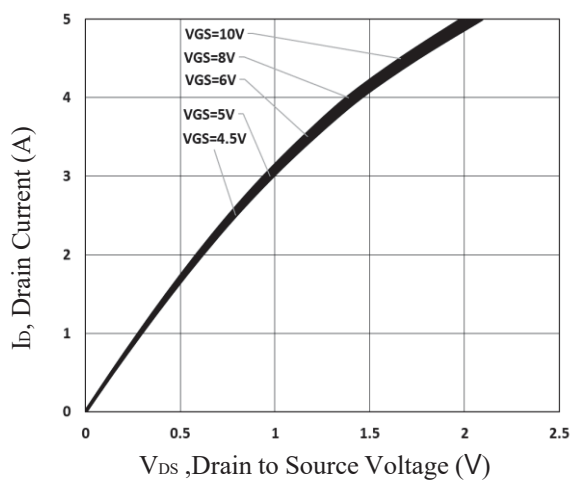


Fig.5 Typical Output Characteristics

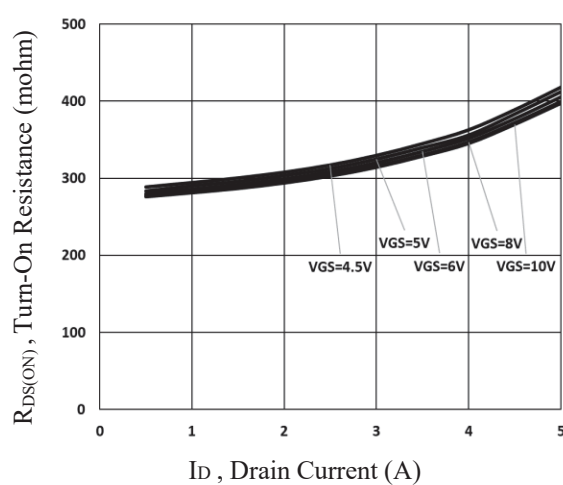


Fig.6 Turn-On Resistance vs. I_D

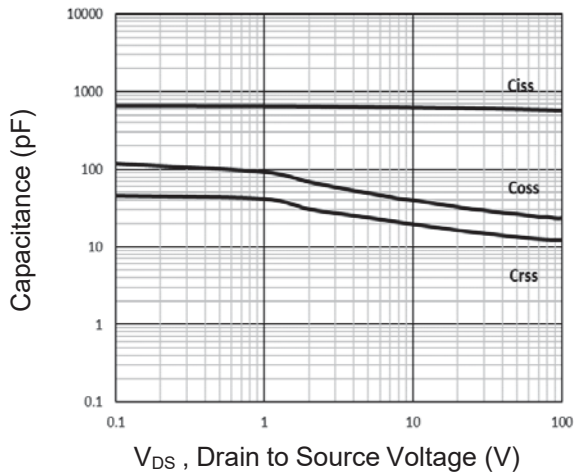


Fig.7 Capacitance Characteristics

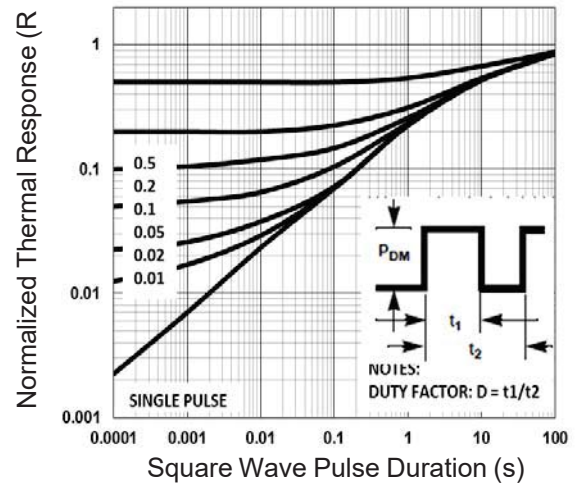


Fig.8 Normalized Transient Impedance

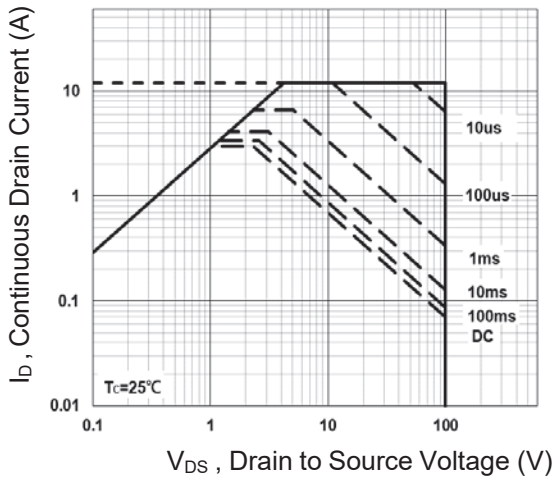


Fig.9 Maximum Safe Operation Area

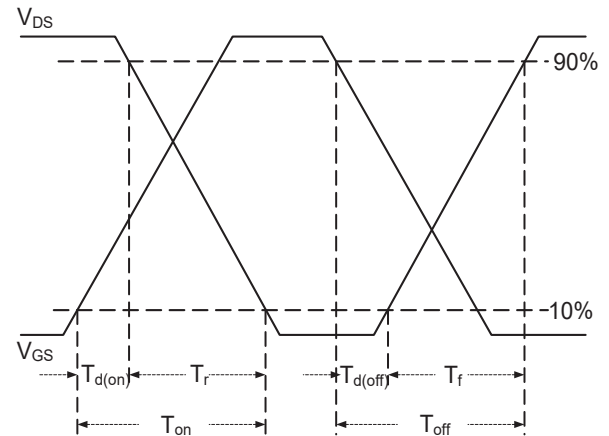


Fig.10 Switching Time Waveform

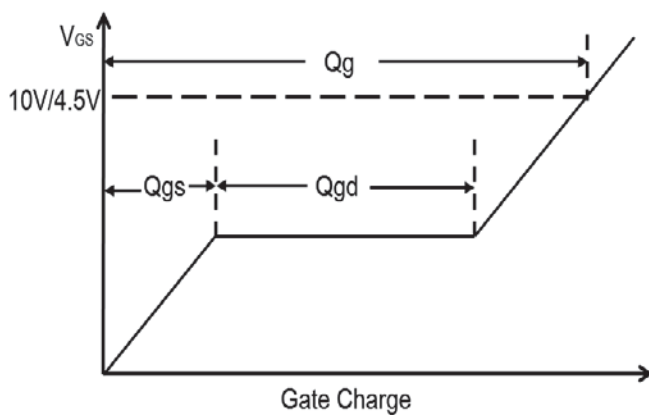


Fig.11 Gate Charge Waveform