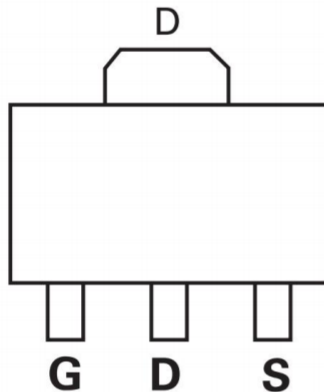


Product Summary

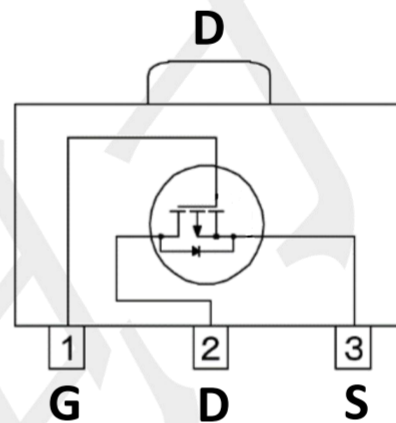
- V_{DS} -60 V
- I_{DS} (at $V_{GS}=-10V$) -4.0A
- $R_{DS(ON)}$ (@ $V_{GS}=-10V$) $\leq 88m\Omega$ (Typ)

Package and Pin Configuration



SOT89-3

Circuit diagram



Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	-4.0	A
Pulsed Drain Current (t = 100 μ s)	I_{DM}	-16	A
Total Power Dissipation	P_{DTOT}	1.6	W
Operating Junction Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{stg}	-55 to +150	°C

Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance	R_{thJA}	78	°C/W

Note : When mounted on 1" square PCB (FR4 material).

Electrical Characteristics (T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	BV_{DSS}	-60	--	--	V
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.0	-1.5	-3.0	V
Gate-Source Leakage	$V_{DS}=0V, V_{GS}=\pm 20V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS}=-48V, V_{GS}=0V$	I_{DSS}	--	--	-1	μA
Drain-Source On-State Resistance (Note 1)	$V_{GS}=-10V, I_D=-4.0A$	$R_{DS(on)}$	--	88	100	m Ω
	$V_{GS}=-4.5V, I_D=-2.0A$		--	110	140	
Forward Transconductance (Note 2)	$V_{DS}=-5V, I_D=-3.0A$	g_{fs}	--	6.7	--	S
Dynamic (Note 2)						
Total Gate Charge (Note 3)	$V_{DS}=-48V,$ $I_D=-3.0A,$ $V_{GS}=-4.5V$	Q_g	--	11.8	--	nC
Gate-Source Charge (Note 3)		Q_{gs}	--	1.8	--	
Gate-Drain Charge (Note 3)		Q_{gd}	--	6.5	--	
Input Capacitance	$V_{DS}=-15V,$ $V_{GS}=0V,$ $F=1.0MHz$	C_{iss}	--	1060	--	pF
Output Capacitance		C_{oss}	--	71	--	
Reverse Transfer Capacitance		C_{rss}	--	50	--	
Switching						
Turn-On Delay Time (Note 3)	$V_{DS}=-15V,$ $I_D=-1.0A,$ $V_{GS}=-10V,$ $R_G=3.3\Omega$	$t_{d(on)}$	--	8.8	--	nS
Rise Time (Note 3)		t_r	--	19.5	--	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	47	--	
Fall Time (Note 3)		t_f	--	9.5	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	$V_{GS}=0V, I_F=-1.0A$	V_{SD}	--	-0.8	-1.2	V
Continuous Source Current	Integral reverse diode in the MOSFET	I_S	--	--	-4.0	A
Pulsed Current (Note 1)		I_{SM}	--	--	-16	A

Notes:

1. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

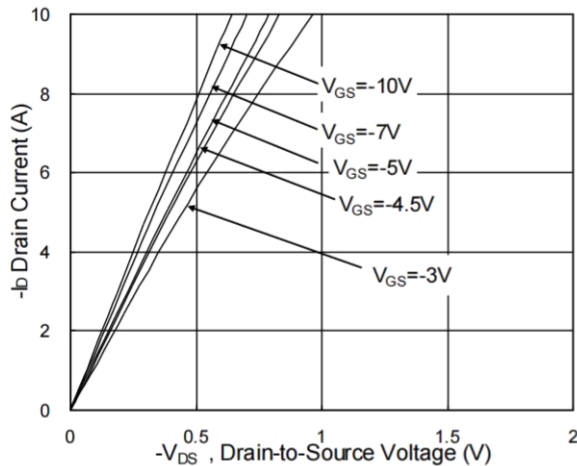


Fig.1 Typical Output Characteristics

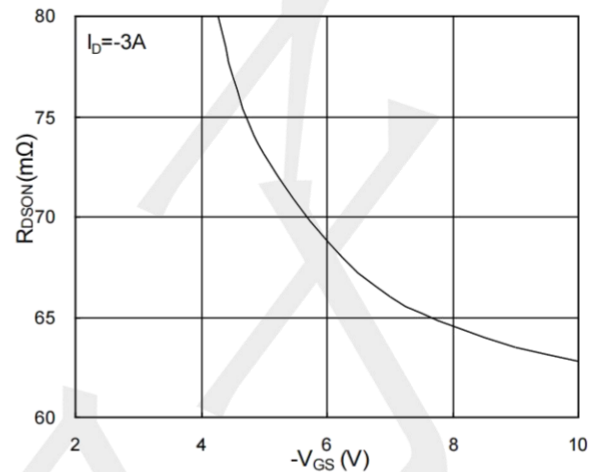


Fig.2 On-Resistance v.s Gate-Source

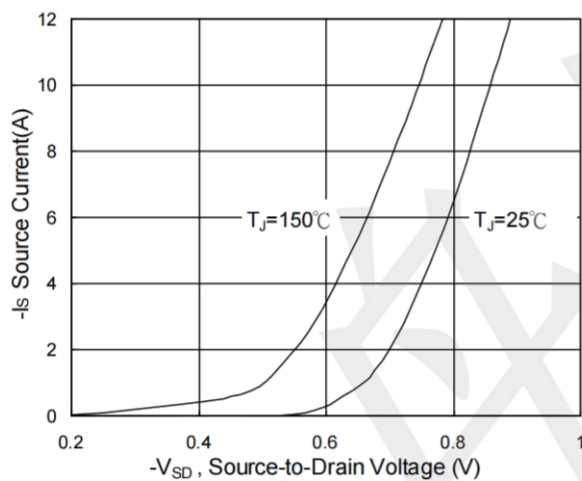


Fig.3 Forward Characteristics of Reverse

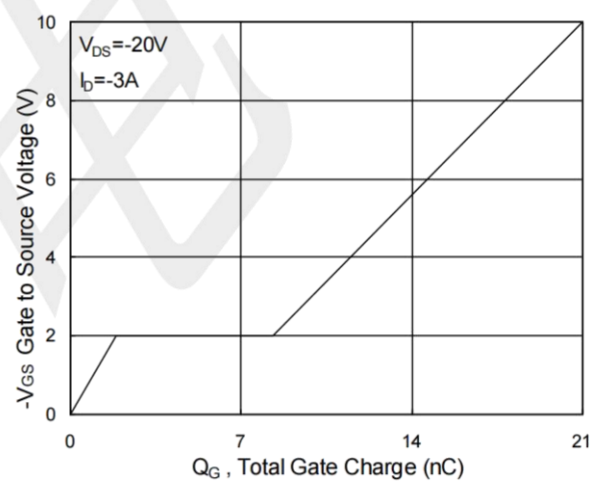


Fig.4 Gate-Charge Characteristics

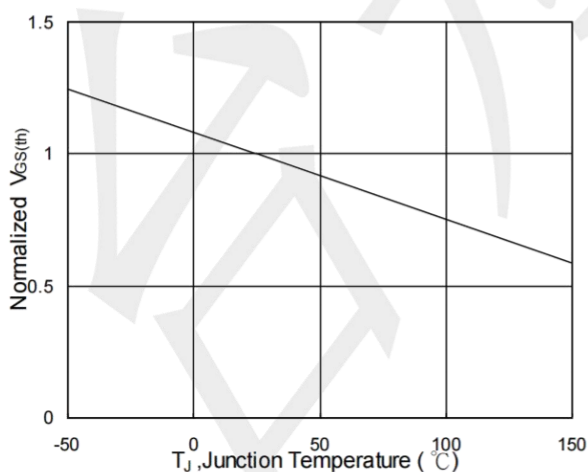


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

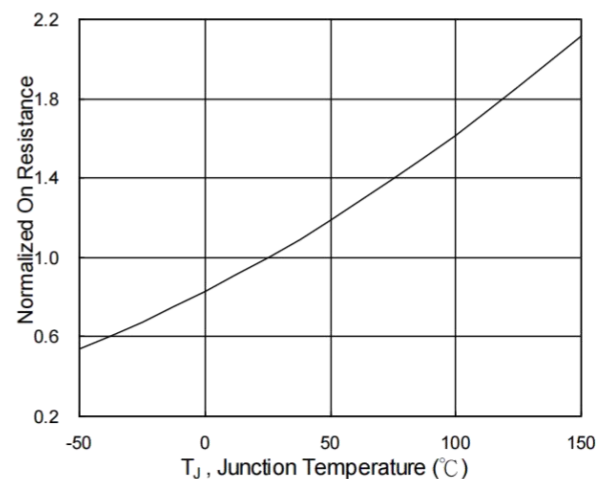


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

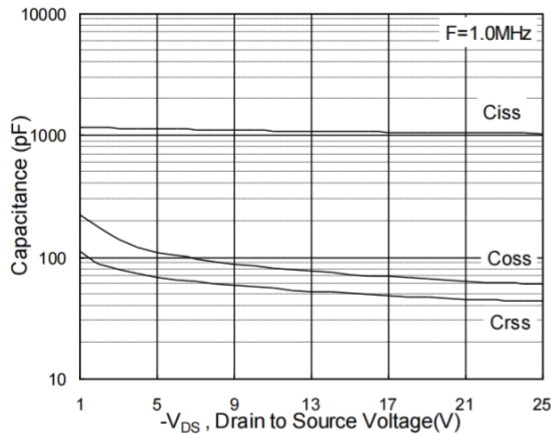


Fig.7 Capacitance

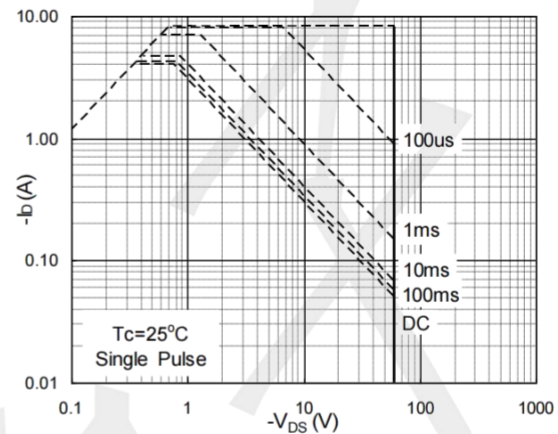


Fig.8 Safe Operating Area

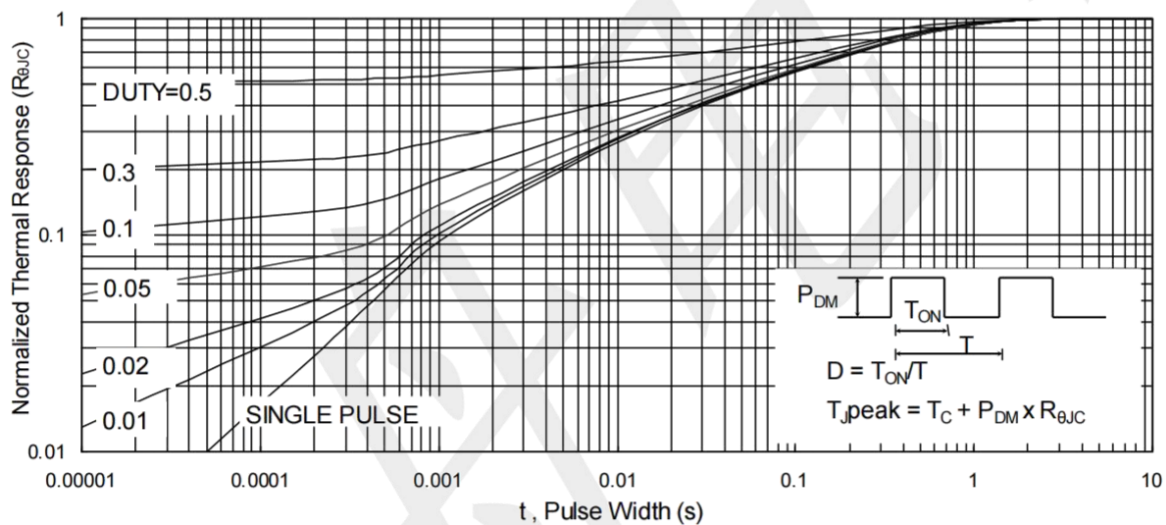


Fig.9 Normalized Maximum Transient Thermal Impedance

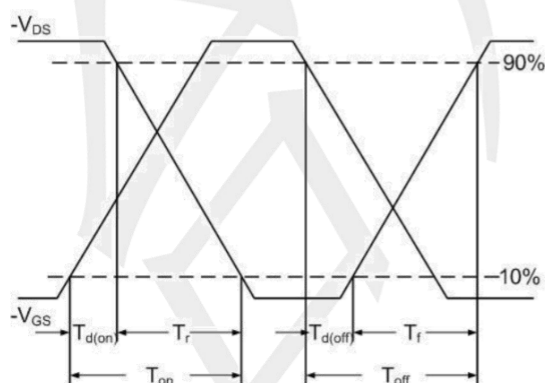


Fig.10 Switching Time Waveform

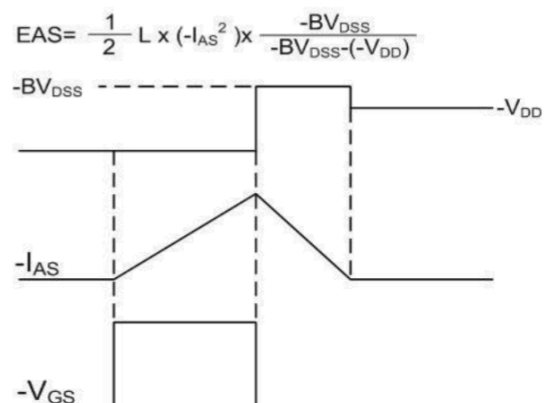
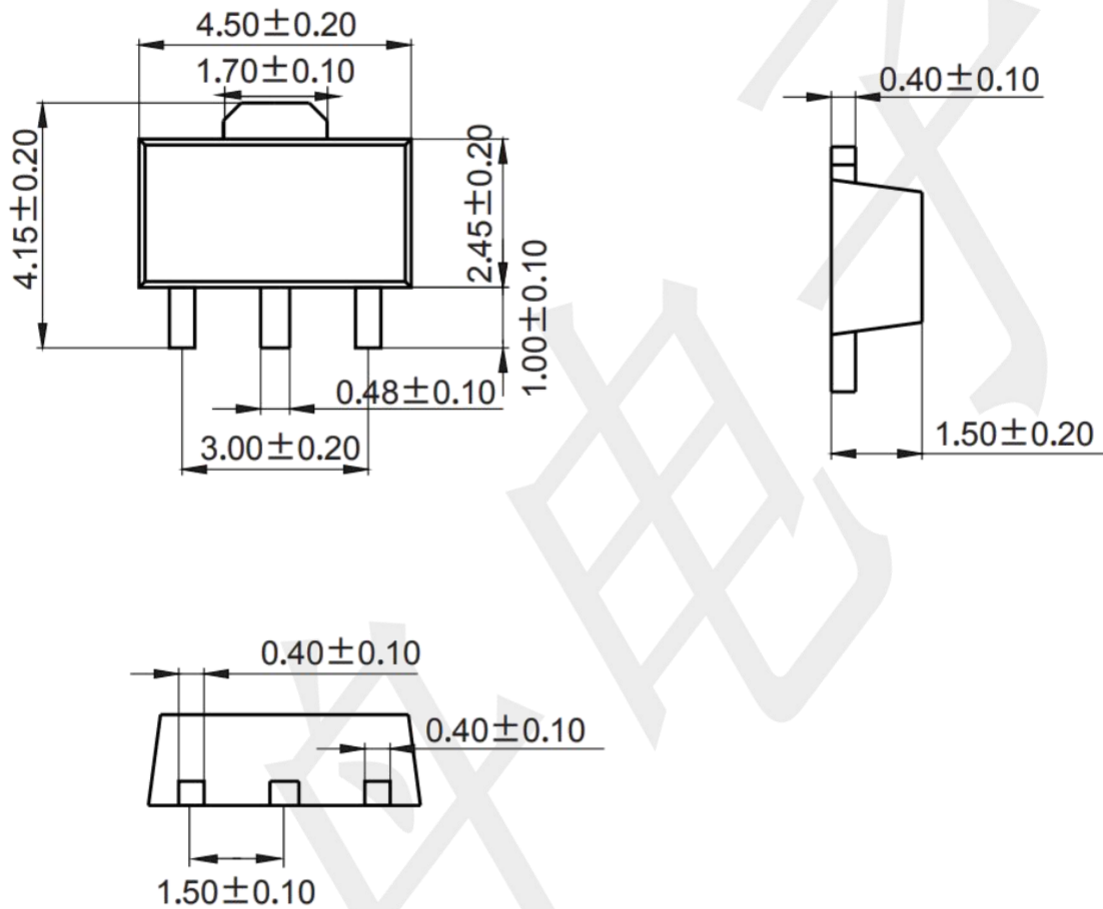


Fig.11 Unclamped Inductive Waveform

Package Information -(unit: mm)

SOT89-3



Mounting Pad Layout (unit: mm)

