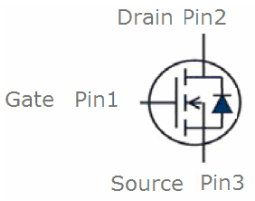
Features

- N-Channel
- Enhancement mode
- Very low on-resistance
- Fast Switching
- High Effective
- Pb-free lead plating; RoHS compliant

Pb-Free RoHS HF Halogen-Free

V_{DS}	60	V
$R_{DS(on),typ@VGS=10V}$	70	mΩ
$R_{DS(on),typ@VGS=4.5V}$	85	mΩ
I_D	4	A

SOT89



Part ID	Package Type	Marking	Tape and reel information
VSR080N06MS	SOT89	080N06	3000pcs/reel

Maximum ratings, at T_j=25 °C, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		60	V
V_{GS}	Gate-Source voltage		±16	V
I_D	Continuous drain current@V_{GS}=10V	T_C=25°C	4	A
		T_A=100°C	2.5	A
I_{DM}	Pulse drain current tested ①	T_C=25°C	16	A
P_D	Maximum power dissipation	T_C=25°C	5	W
I_S	Diode Continuous Forward Current	T_C=25°C	4	A
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage and operating temperature range		-55 to 175	°C
Thermal characteristics				
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		25	°C/W

Typical Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	V_{DS}=60V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)	V_{DS}=60V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±16V,V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	1.7	3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=10V, I_D=3A	--	70	80	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=4.5V, I_D=2A	--	85	100	mΩ
gfs	Forward Transconductance	V_{DS}= 15V, I_D=1.8A	3	--	--	S
Dynamic Electrical Characteristics @ T_J= 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=30V,V_{GS}=0V, f=1MHz	--	435	--	pF
C_{oss}	Output Capacitance		--	40	--	pF
C_{rss}	Reverse Transfer Capacitance		--	28	--	pF
Q_g	Total Gate Charge	V_{DS}=30V,I_D=1A, V_{GS}=10V	--	6	--	nC
Q_{gs}	Gate-Source Charge		--	1.7	--	nC
Q_{gd}	Gate-Drain Charge		--	1.5	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V, I_D=1A, R_G=6.8Ω, V_{GS}=4.5V	--	6	--	nS
t_r	Turn-on Rise Time		--	15	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	16	--	nS
t_f	Turn-Off Fall Time		--	10	--	nS
Source- Drain Diode Characteristics@ T_J= 25°C (unless otherwise stated)						
I_{SD}	Source-drain current(Body Diode) ②	T_C=25℃	--	--	4	A
V_{SD}	Forward on voltage	I_{SD}=3A,V_{GS}=0V	--	0.84	1.20	V

NOTE:

① Repetitive rating; pulse width limited by max. junction temperature.

② Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Characteristics

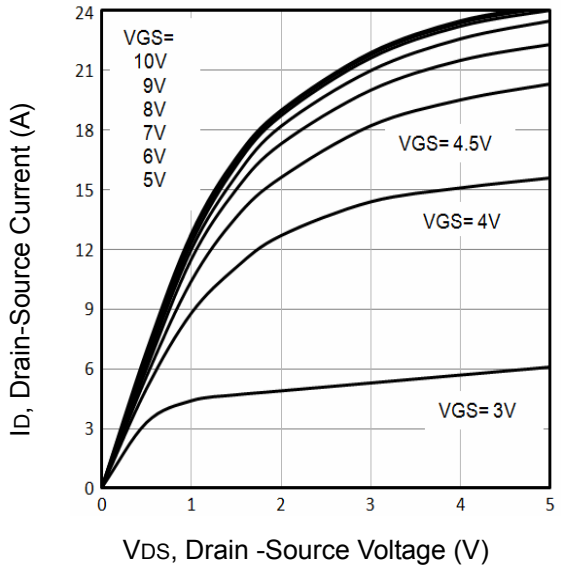


Fig1. Typical Output Characteristics

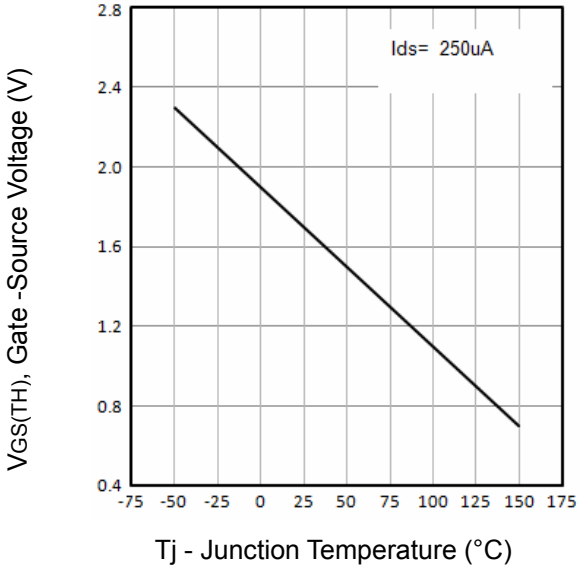


Fig2. Threshold Voltage Vs. Temperature

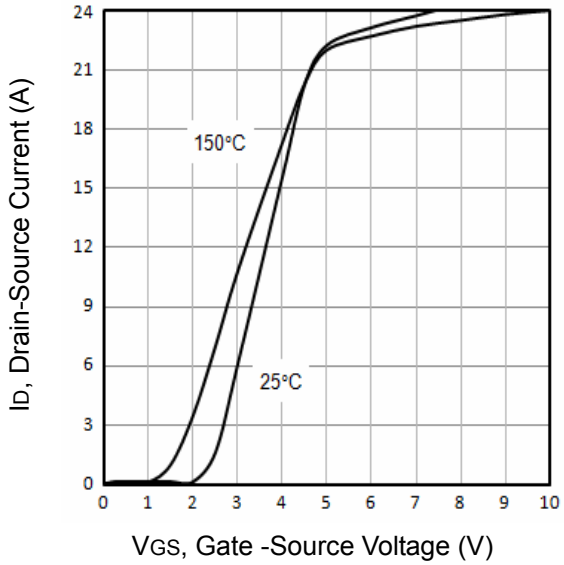


Fig3. Typical Transfer Characteristics

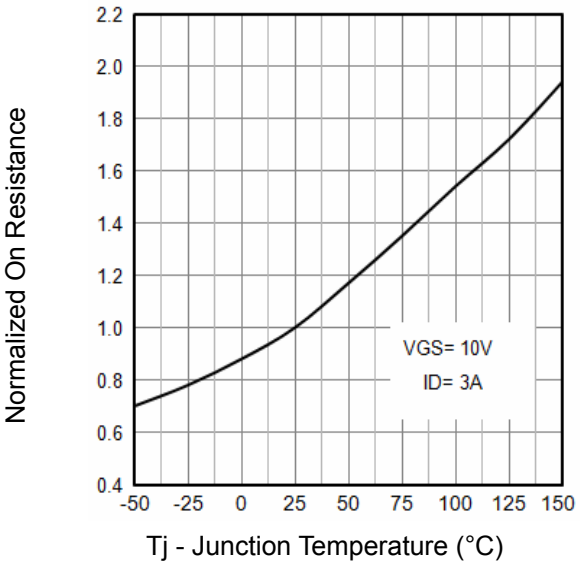


Fig4. Normalized On-Resistance Vs. Temperature

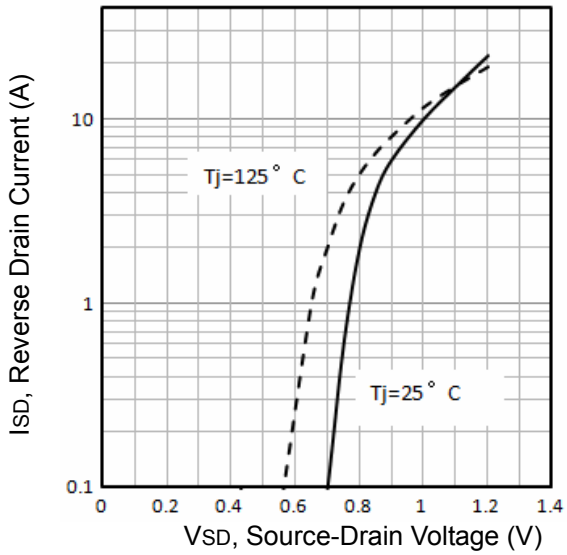


Fig5. Typical Source-Drain Diode Forward Voltage

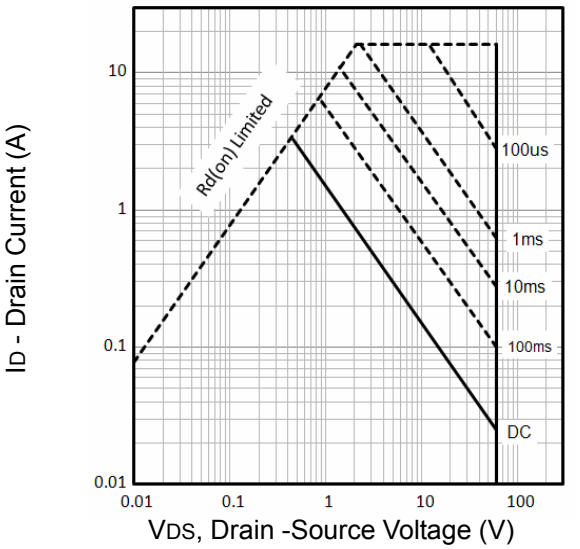


Fig6. Maximum Safe Operating Area

Typical Characteristics

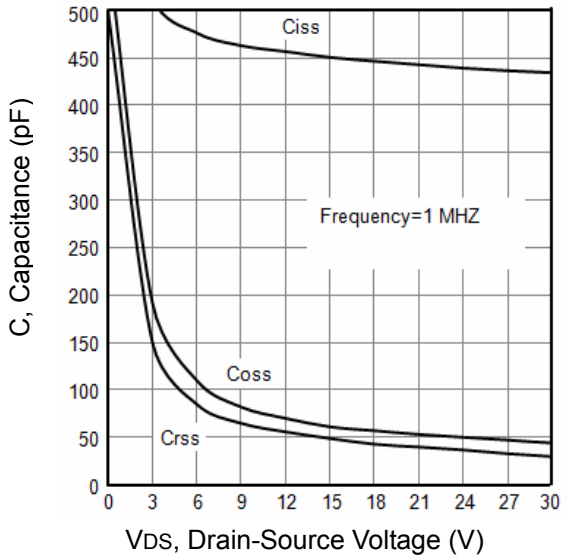


Fig7. Typical Capacitance Vs. Drain-Source Voltage

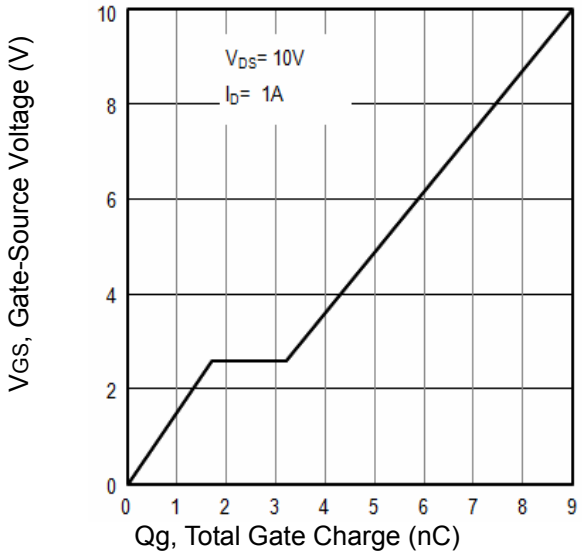


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

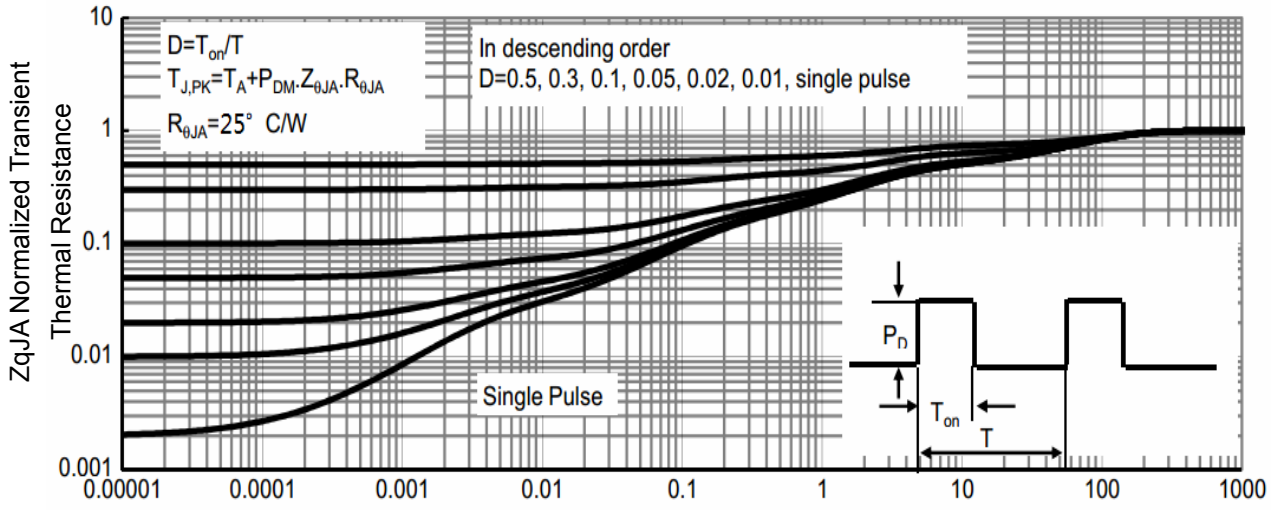


Figure 9: Normalized Maximum Transient Thermal

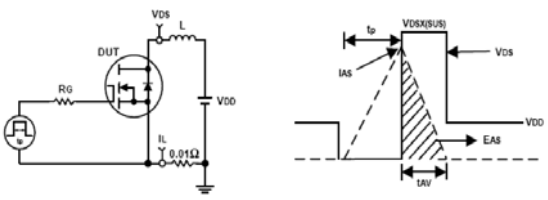


Fig10. Unclamped Inductive Test Circuit and waveforms

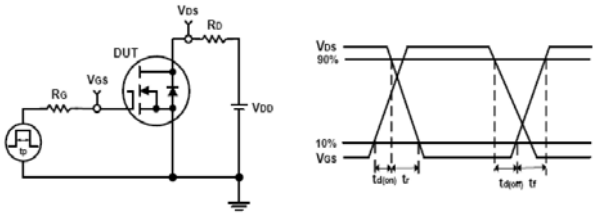
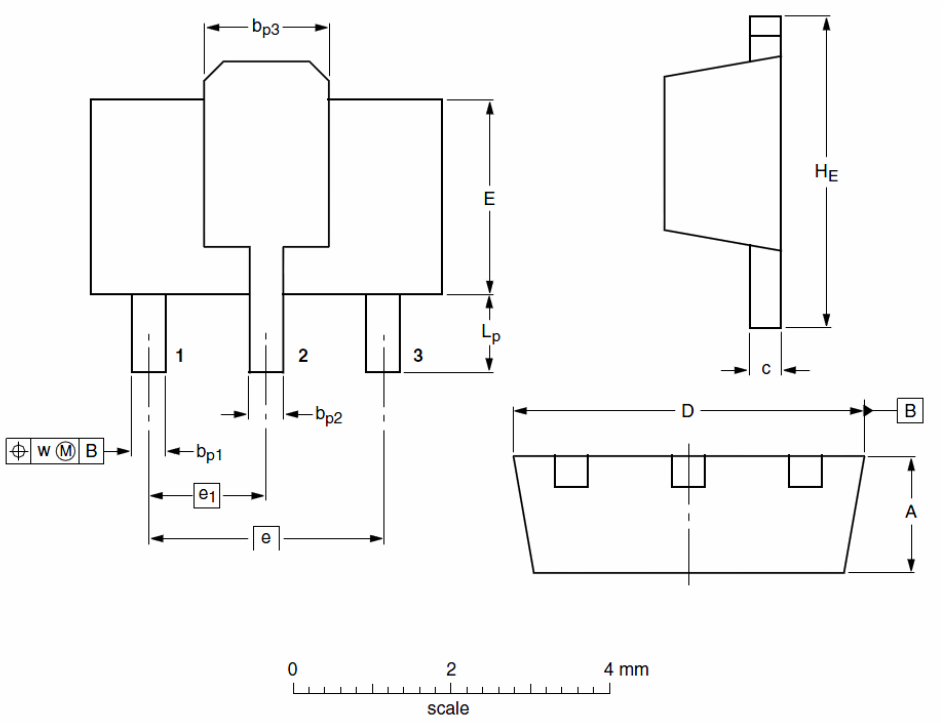


Fig11. Switching Time Test Circuit and waveforms

SOT89 Package Outline Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	1.40	1.50	1.60	**b_{p1}**	0.35	0.43	0.48
b_{p2}	0.40	0.47	0.53	**b_{p3}**	1.40	1.68	1.80
c	0.23	0.35	0.44	**D**	4.40	4.48	4.60
E	2.40	2.51	2.60	**e**	--	3.00	--
e_1	--	1.50	--	**H_e**	3.75	4.08	4.25
L_p	0.80	0.90	1.20	**w**	--	0.13	--

Customer Service

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