

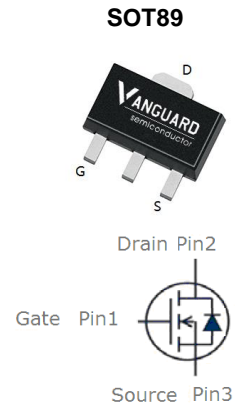
Features

- N-Channel, 3.3V Logic Level Control
- Enhancement mode
- Low on-resistance $R_{DS(on)}$ @ $V_{GS}=4.5\text{ V}$
- Fast Switching and High efficiency
- Pb-free lead plating; RoHS compliant



Part ID	Package Type	Marking	Tape and reel information
VSR080NE8LS	SOT89	080NE8	3000pcs/Reel

V_{DS}	85	V
$R_{DS(on),TYP} @ V_{GS}=10\text{ V}$	75	m Ω
$R_{DS(on),TYP} @ V_{GS}=4.5\text{ V}$	77	m Ω
I_D	12	A



Maximum ratings, at $T_A = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage	85	V
V_{GS}	Gate-Source voltage	± 16	V
I_S	Diode continuous forward current	$T_C = 25^\circ\text{C}$	12 A
I_D	Continuous drain current @ $V_{GS}=10\text{V}$	$T_C = 25^\circ\text{C}$	12 A
		$T_C = 100^\circ\text{C}$	7.7 A
I_{DM}	Pulse drain current tested ①	$T_C = 25^\circ\text{C}$	48 A
EAS	Avalanche energy, single pulsed ②	68	mJ
P_D	Maximum power dissipation	$T_C = 25^\circ\text{C}$	20 W
T_{STG}, T_J	Storage and Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	6.3	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	100	$^\circ\text{C/W}$



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	85	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =85V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current (T _j =125°C)	V _{DS} =85V, 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	0.6	1	1.3	V
R _{DS(ON)}	Drain-Source On-State Resistance ^③	V _{GS} =10V, I _D =5A	--	75	97	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ^③	V _{GS} =4.5V, I _D =4A	--	77	100	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	640	750	860	pF
C _{oss}	Output Capacitance		38	45	52	pF
C _{rss}	Reverse Transfer Capacitance		34	40	46	pF
R _g	Gate Resistance	f=1MHz	--	5.3	--	Ω
Q _g (10V)	Total Gate Charge	V _{DS} =40V, I _D =5A, V _{GS} =10V	--	18.3	--	nC
Q _g (4.5V)	Total Gate Charge		--	11	--	nC
Q _{gs}	Gate-Source Charge		--	4.8	--	nC
Q _{gd}	Gate-Drain Charge		--	6.1	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =40V, I _D =5A, R _G =3Ω, V _{GS} =10V	--	8	--	ns
t _r	Turn-on Rise Time		--	4.5	--	ns
t _{d(off)}	Turn-Off Delay Time		--	23	--	ns
t _f	Turn-Off Fall Time		--	4.4	--	ns
Source- Drain Diode Characteristics @ T_j = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =5A, V _{GS} =0V	--	0.8	1.2	V
t _{rr}	Reverse Recovery Time	T _j =25°C, I _{sd} =5A, V _{GS} =0V	--	23	--	ns
Q _{rr}	Reverse Recovery Charge	di/dt=500A/μs	--	96	--	nC

NOTE:

- ① Repetitive rating; pulse width limited by max junction temperature.
- ② Limited by T_{jmax}, starting T_j = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = 13A, V_{GS} = 10V. Part not recommended for use above this value.
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

Typical Characteristics

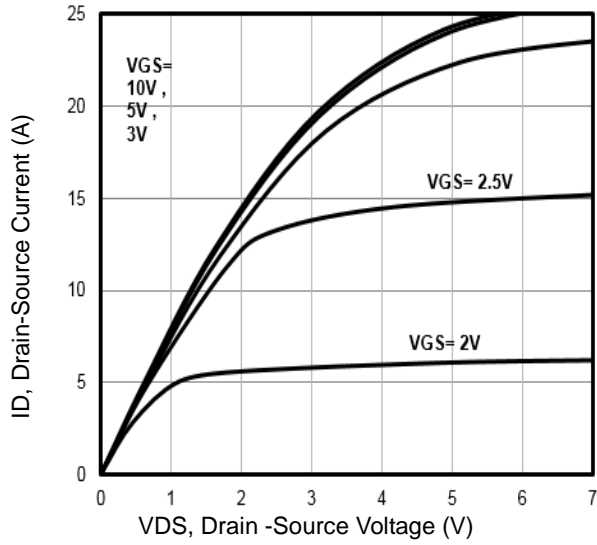


Fig1. Typical Output Characteristics

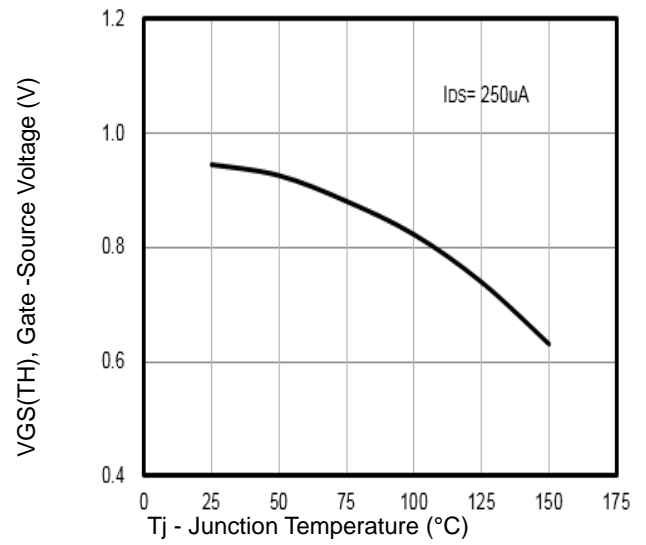


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. T_j

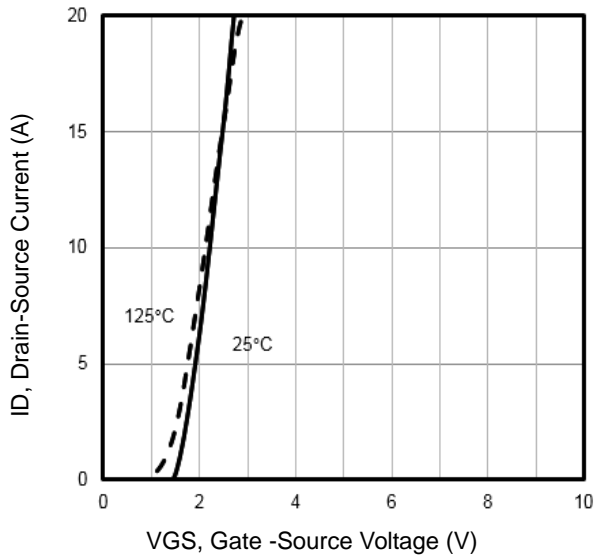


Fig3. Typical Transfer Characteristics

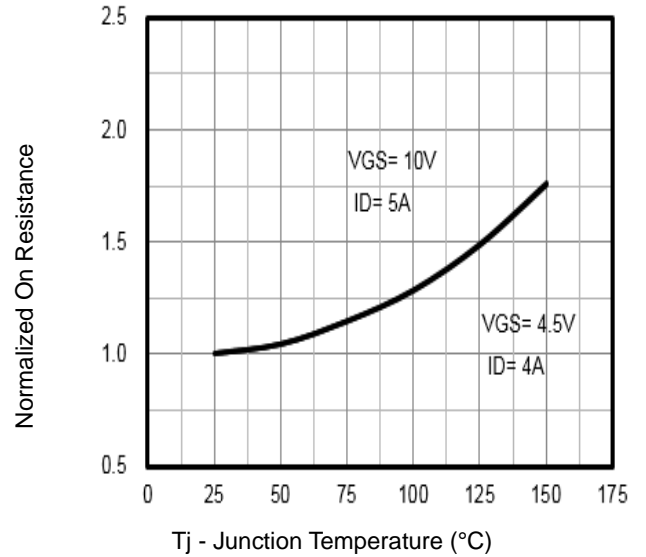


Fig4. Normalized On-Resistance Vs. T_j

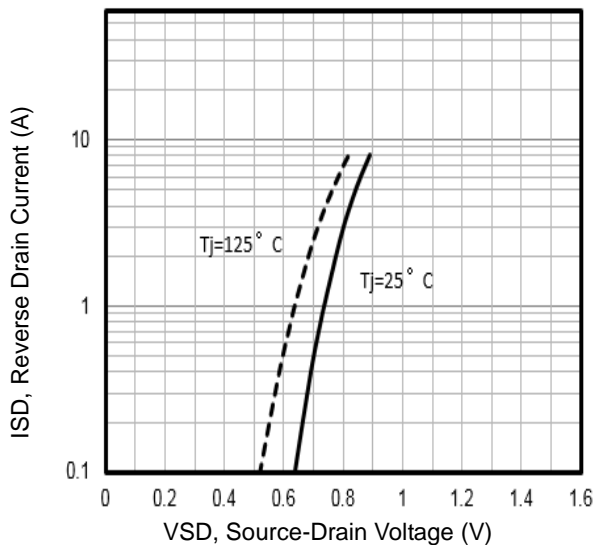


Fig5. Typical Source-Drain Diode Forward Voltage

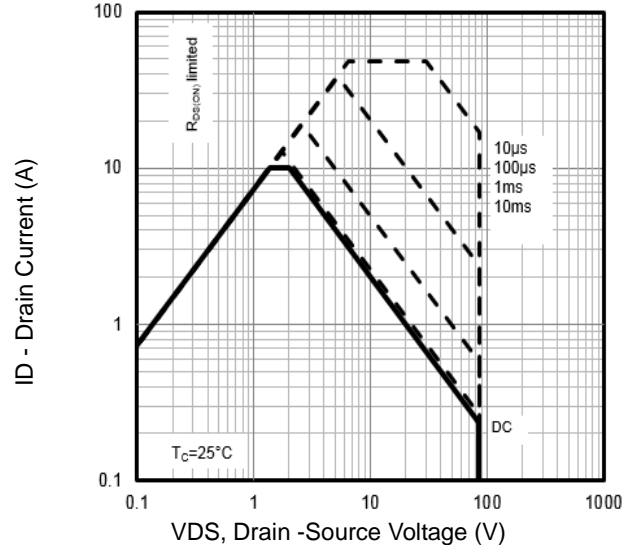


Fig6. Maximum Safe Operating Area

Typical Characteristics

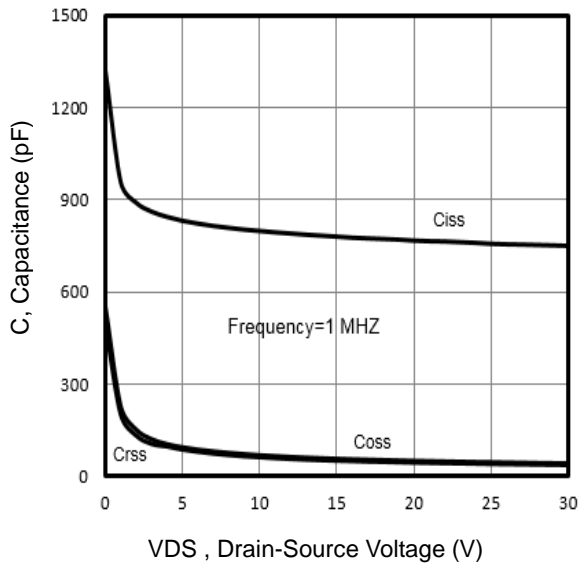


Fig7. Typical Capacitance Vs.Drain-Source Voltage

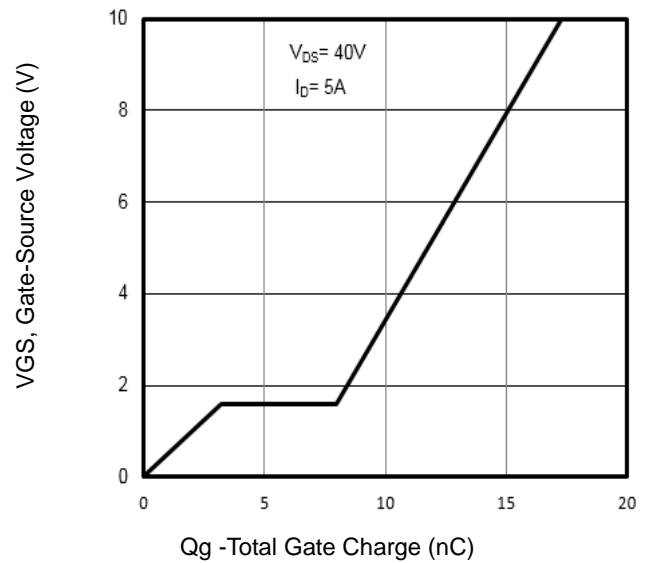


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

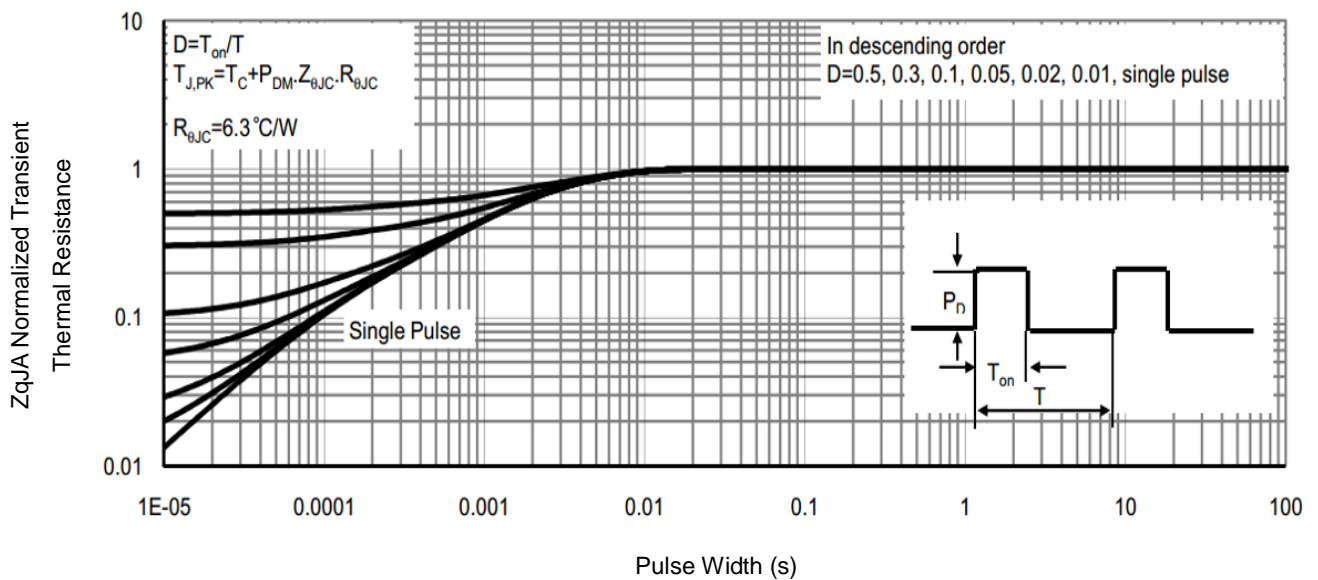


Fig9. Normalized Maximum Transient Thermal Impedance

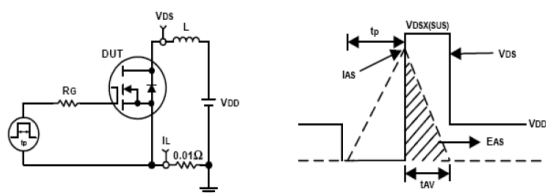


Fig10. Unclamped Inductive Test Circuit and waveforms

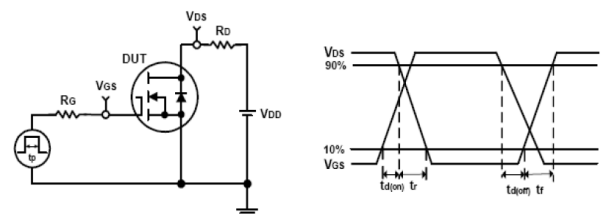
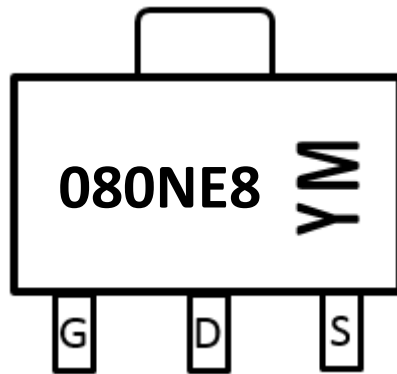


Fig11. Switching Time Test Circuit and waveforms



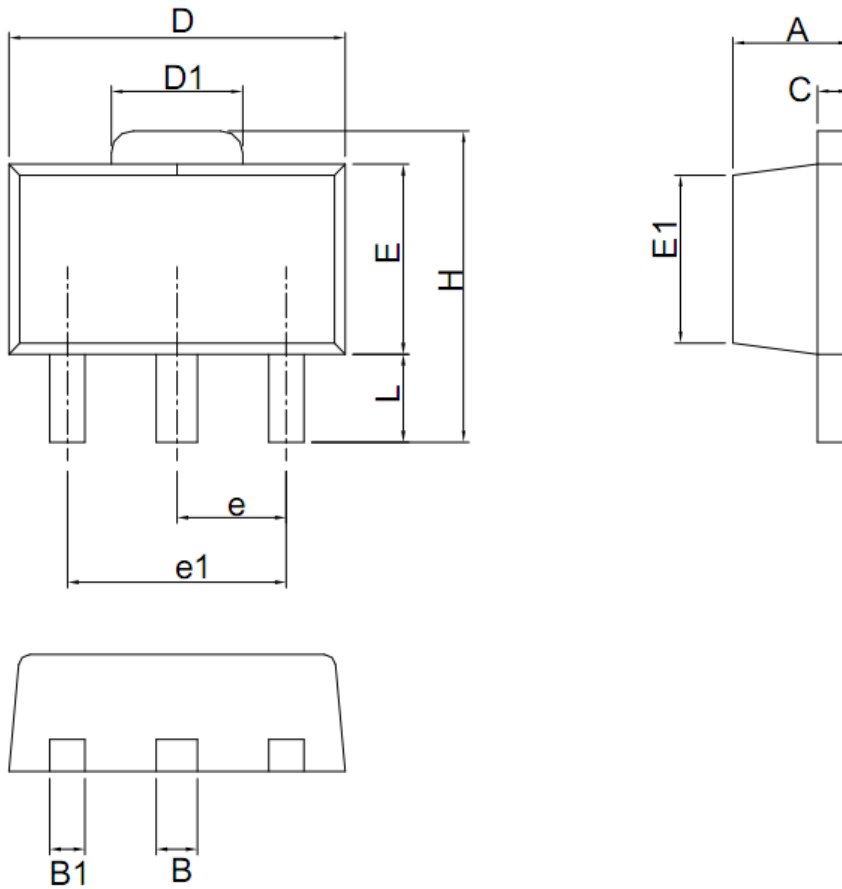
Marking Information



080NE8: Part Number

YM: Date Code, Y means assembly year, M means assembly month

SOT89 Package Outline Data



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	1.40	1.50	1.60
B	0.44	0.51	0.56
B1	0.36	0.42	0.48
C	0.35	0.40	0.44
D	4.40	4.50	4.60
D1	1.62	1.70	1.83
E	2.40	2.50	2.60
E1	2.13		2.29
e		1.50 BSC	
e1		3.00 BSC	
H	3.94	4.20	4.25
L	0.89	1.00	1.20

Notes:

1. Refer to JEDEC TO-243 variation AA

Customer Service

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