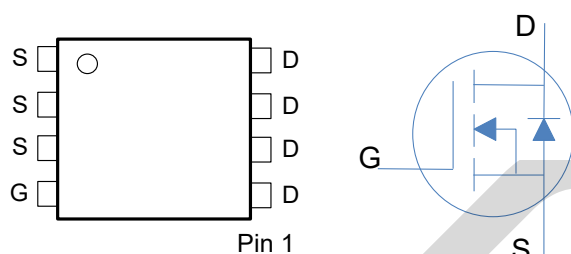
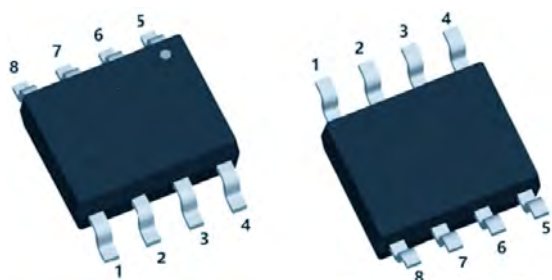


Trench N-channel Power MOSFET

MSR009N03P8 SOP8



V_{DS}	30	V
$R_{DS(on),TYP@ V_{GS}=10V}$	7.5	mΩ
I_D	12	A

Features

- 1、Low on – resistance
- 2、High power package (SOP8)
- 3、TrenchFET Power MOSFET
- 4、Halogen free

Applications

- 1、Load Switch for Portable Devices
- 2、DC/DC Converter

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

Symbol	Parameter		Rating	Unit
V(BR)DSS	Drain-Source breakdown voltage		30	V
VGS	Gate-Source voltage		±20	V
ID	Continuous drain current @VGS=10V	Tc =25°C	12	A
		Tc =100°C	7.5	A
IDM	Pulse drain current tested ①	Tc =25°C	48	A
EAS	Avalanche energy, single pulsed ②		144	mJ
PD	Maximum power dissipation	Tc =25°C	3.5	W
TSTG,TJ	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	20	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	36	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
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Static Electrical Characteristics @ T_J=25°C (unless otherwise stated)

V(BR) _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	34	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V	--	--	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{BS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
R _{DS(on)}	Drain-Source On-State Resistance ④	V _{GS} =10V, I _D =12A	--	7.5	9.0	mΩ
		V _{GS} =4.5V, I _D =5A	--	11	15	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =10A	--	15	--	S

Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)

C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	1600	--	pF
C _{oss}	Output Capacitance		--	280	--	pF
C _{rss}	Reverse Transfer Capacitance		--	195	--	pF
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz	--	2.3	--	Ω
Q _g (10V)	Total Gate Charge	V _{DS} =25V, I _D =12A , V _{GS} =10V	--	35	--	nC
Q _{gs}	Gate-Source Charge		--	6	--	nC
Q _{gd}	Gate-Drain Charge		--	11	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DS} =15V, R _L =0.75Ω, R _G =3Ω, V _{GS} =10V	--	9	--	ns
Tr	Turn-on Rise Time		--	26	--	ns
Td(off)	Turn-Off Delay Time		--	35	--	ns
Tf	Turn-Off Fall Time		--	8	--	ns

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction

Temperature Notes 3.EAS condition: T_J=25℃,V_{DD}=15V,V_G=10V, R_G=25Ω,

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Typical Characteristics

Figure 1. Output Characteristics

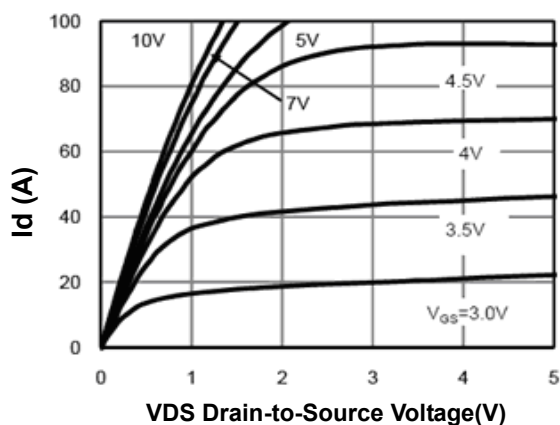


Figure 2. Transfer Characteristics

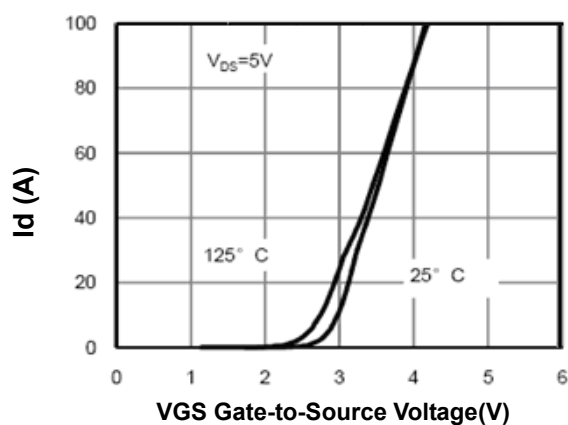


Figure 3. Max BV_{DSS} vs Junction Temperature

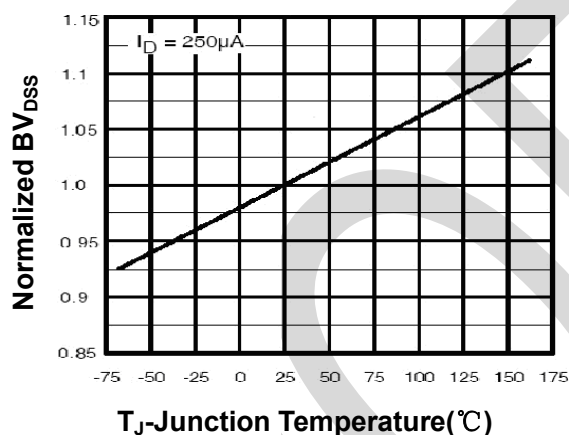


Figure 4. Drain Current

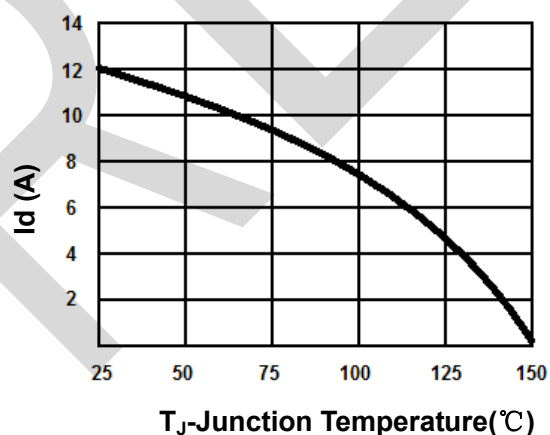


Figure 5. $V_{GS(th)}$ vs Junction Temperature

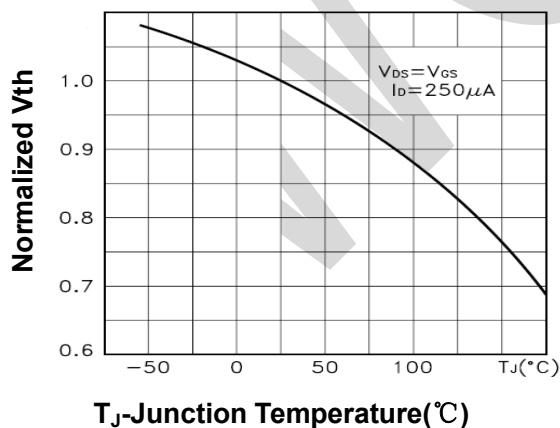
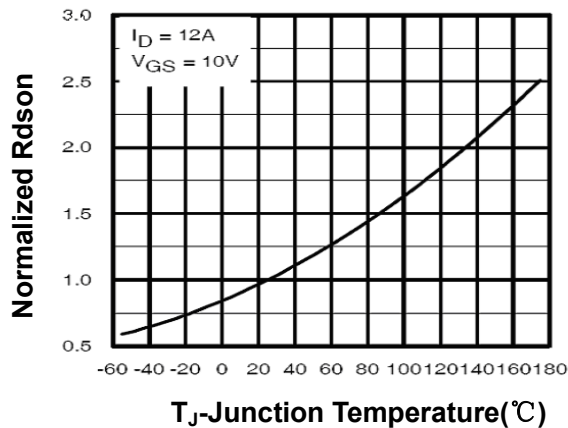


Figure 6. $R_{DS(on)}$ vs Junction Temperature



Typical Characteristics

Figure 7. Gate Charge Waveforms

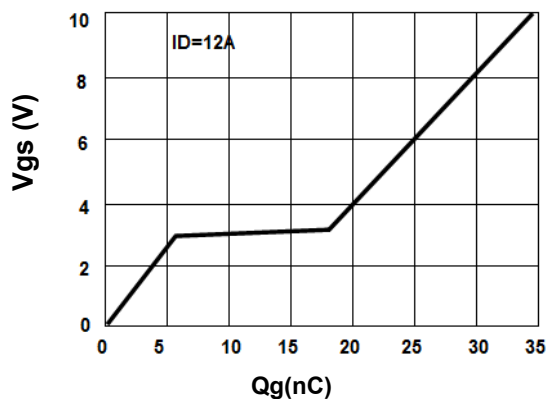


Figure 8. Capacitance

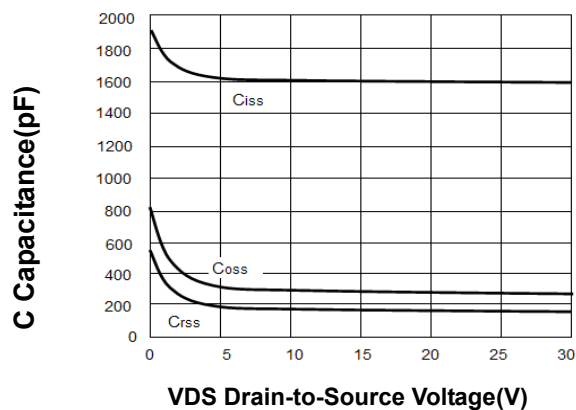


Figure 9. Body-Diode Characteristics

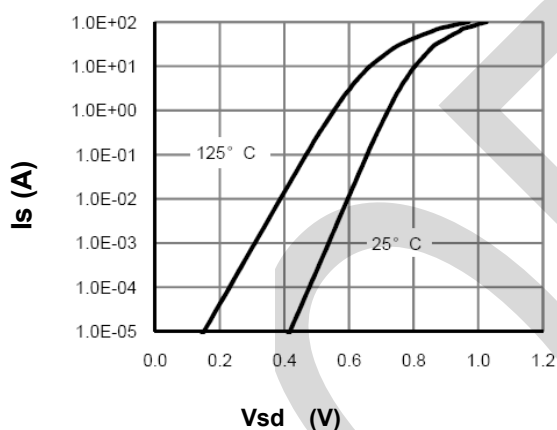


Figure 10. Maximum Safe Operating Area

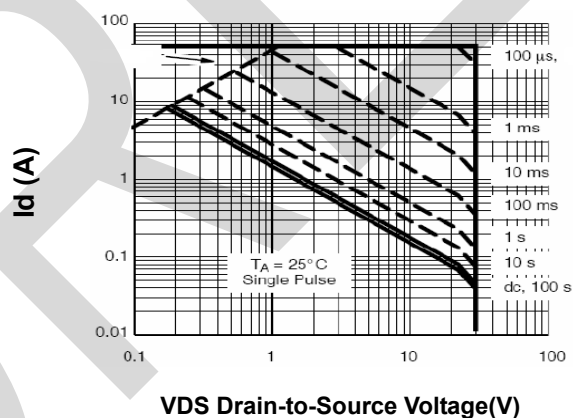
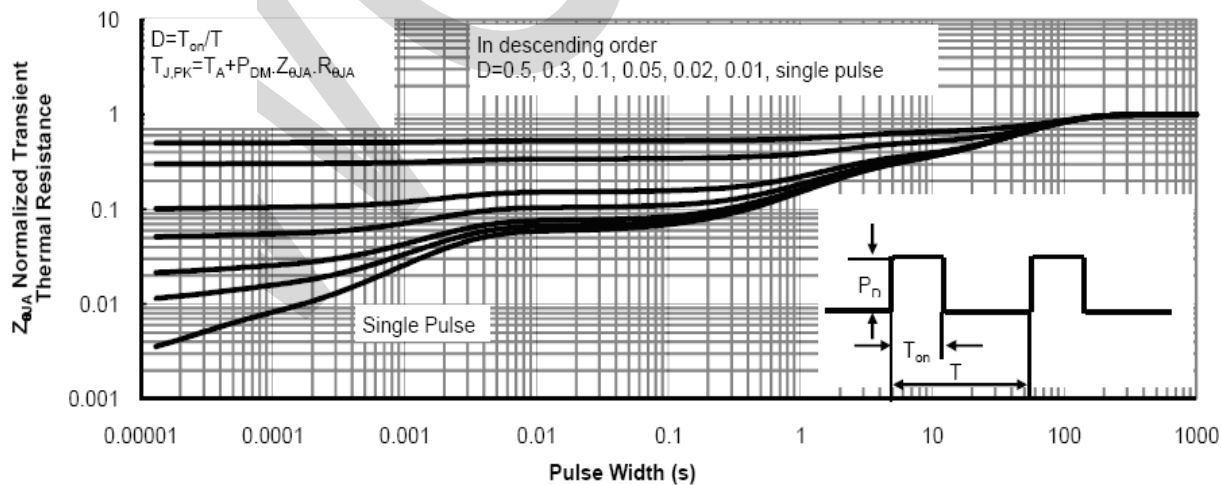
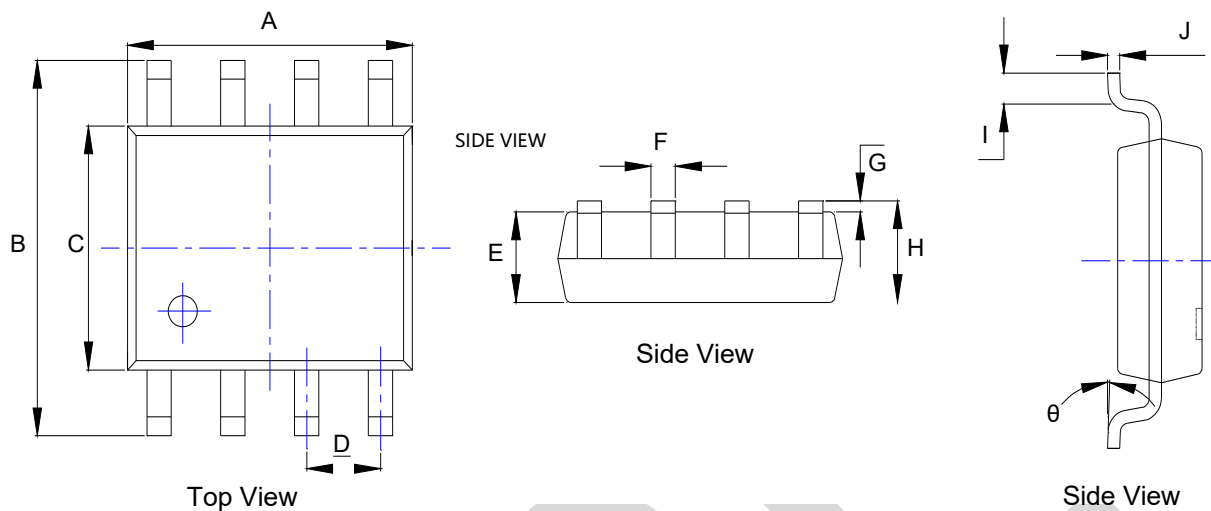


Figure 11. Normalized Maximum Transient Thermal Impedance



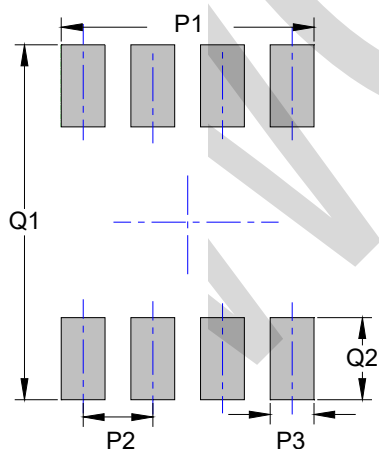
PACKAGE OUTLINE DIMENSIONS



SOP8 mechanical data

UNIT		A	B	C	D	E	F	G	H	I	J	θ
mm	min	4.80	5.80	3.80	1.27 TYP	1.35	0.33	0.10	1.35	0.40	0.17	0°
	max	5.00	6.20	4.00		1.55	0.51	0.25	1.75	1.27	0.25	8°
mil	min	157.4	228.3	149.6	50.0 TYP	53.1	13.0	3.9	53.1	15.7	6.7	0°
	max	196.9	244.1	157.5		61.1	20.1	9.9	68.9	50.0	9.8	8°

SOP8 Suggested Pad Layout



UNIT		P1	P2	P3	Q1	Q2
mm	min	4.61	1.27	0.80	6.50	1.50
mil	min	181.5	50.0	31.5	255.9	59.0