30V N-Channel MOSFET

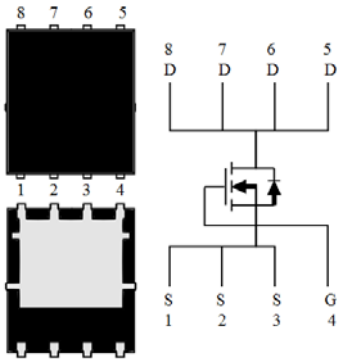
Applications:

- DC-DC Converters
- Motor Bridge Switch
- OringFET/Load Switching

V_{DS}	$R_{DS(ON)}$(MAX)	I_D
30V	1.9mΩ	32A

Features:

- Lead Free
- Low $R_{DS(ON)}$ to Minimize Conductive Loss
- Low Gate Charge for Fast Switching Application
- Optimized $V_{(BR)DSS}$ Ruggedness



PowerPAK Pin Definition and Inner Circuit

Ordering Information

Park Number	Package	Brand
MXP31P9SG	PowerPAK	MXP

Absolute Maximum Ratings

T_C=25℃ unless otherwise specified

Symbol	Parameter		Value	Unit
V_{DSS}	Drain-to-Source Voltage		30	V
I_D	Continuous Drain Current	V_{GS}=10V, T_C=25°C	151	A
		V_{GS}=10V, T_A=25°C	32	
I_{DM}	Pulsed Drain Current @V_{GS}=10V		191	
P_D	Power Dissipation	T_C=25°C	78	W
		T_A=25°C	2.5	
V_{GS}	Gate-to-Source Voltage		+/-20	V
T_J and T_{stg}	Operating Junction and Storage Temperature Range		-55 to 150	℃

Thermal Resistance

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.6	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	℃/W

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OFF Characteristics

T_J=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	30	-	-	V	V_{GS}=0V, I_D=1mA
I_{DSS}	Drain-to-Source Leakage Current	-	-	1	uA	V_{DS}=24V, V_{GS}=0V
		-	-	100		V_{DS}=24V, V_{GS}=0V, T_J=125 ℃
I_{GSS}	Gate-to-Source Forward Leakage	-	-	100	nA	V_{GS}=+20V
	Gate-to-Source Reverse Leakage	-	-	100		V_{GS}= -20V

ON Characteristics

T_J=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	-	1.4	1.9	mΩ	V_{GS}=10V, I_D=32A
		-	1.8	2.4		V_{GS}=4.5V, I_D=32A
$V_{GS(th)}$	Gate Threshold Voltage	1.2	-	2.5	V	V_{GS}=V_{DS}, I_D=1mA

Dynamic Characteristics

T_J=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions	
Ciss	Input Capacitance	-	2580	-	pF	V_{GS}=0V, V_{DS}=15V, f=1.0MHz	
Coss	Output Capacitance	-	740	-			
Crss	Reverse Transfer Capacitance	-	210	-			
Qg	Total Gate Charge	-	42.8	-	nC	V_{DD}=15V, I_D=32A	V_{GS}=10V
		-	19.6	-			V_{GS}=4.5V
Qgs	Gate-to-Source Charge	-	11.6	-			
Qgd	Gate-to-Drain ("Miller") Charge	-	6.7	-			
Td(on)	Turn-on Delay Time	-	21.8	-	ns	V_{DD}=15V, I_D=16A, V_{GS}=10V, R_G=10Ω, R_L=0.94Ω	
Tr	Rise Time	-	15.6	-			
Td(off)	Turn-off Delay Time	-	74.6	-			
Tf	Fall Time	-	28.5	-			
Rg	Gate Resistance	-	1.4	-	Ω		

Source-Drain Diode Characteristics

T_J=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	-	-	1.2	V	I_S=32A, V_{GS}=0V
Trr	Reverse Recovery Time	-	37.8	-	ns	Is=32A, di/dt=100A/μs
Qrr	Reverse Recovery Charge	-	35.2	-	nC	

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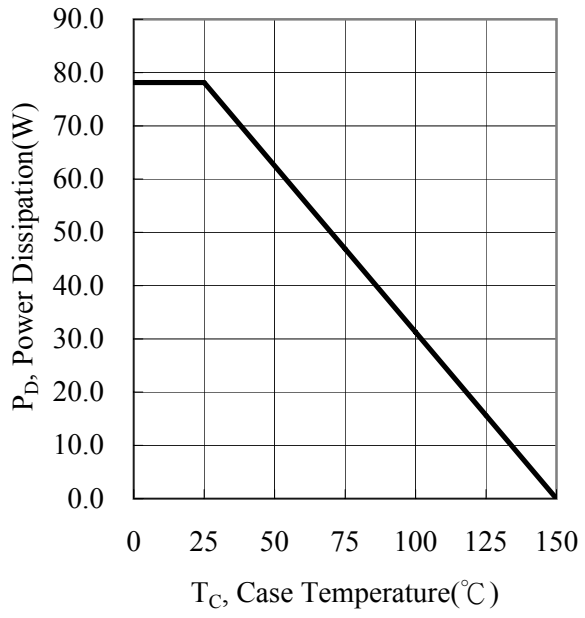
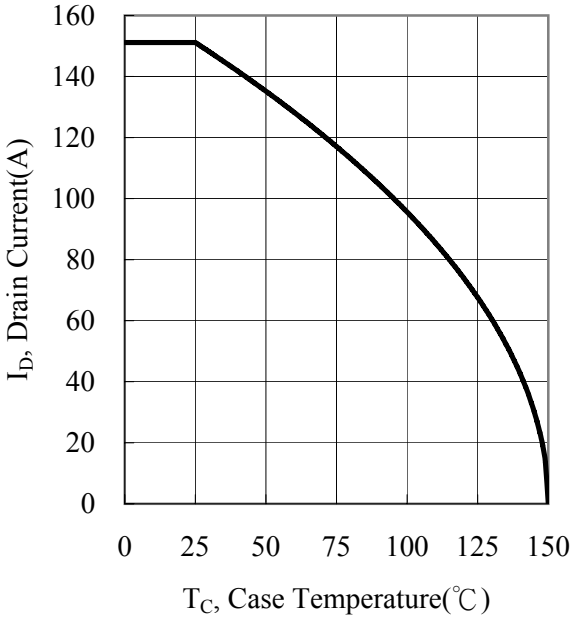
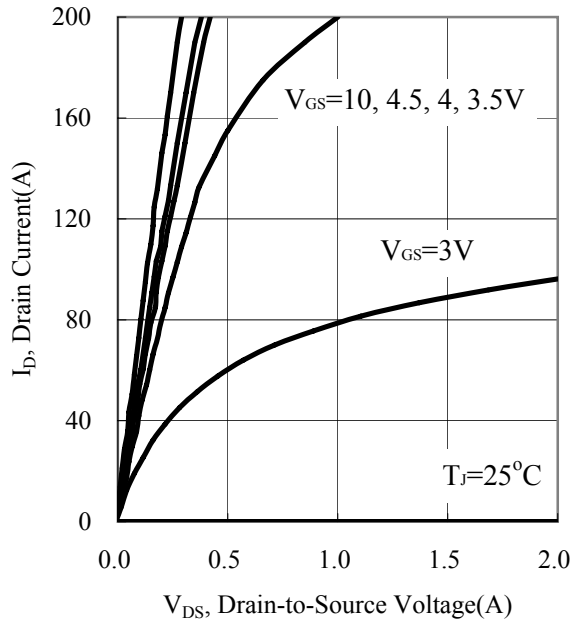
1. Power Dissipation



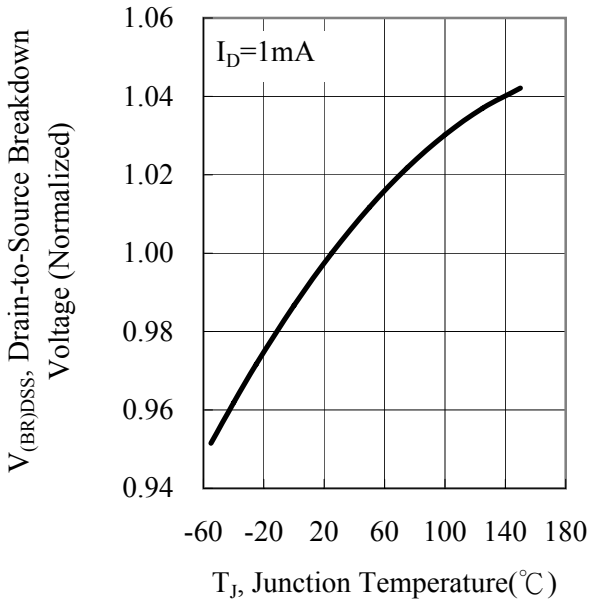
2. Drain Current



3. Output Characteristics T_C=25°C



4. Drain-to-Source Breakdown Voltage



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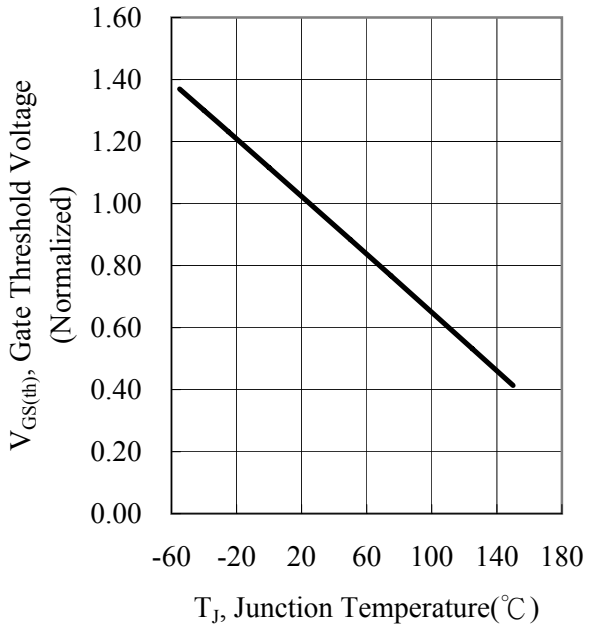
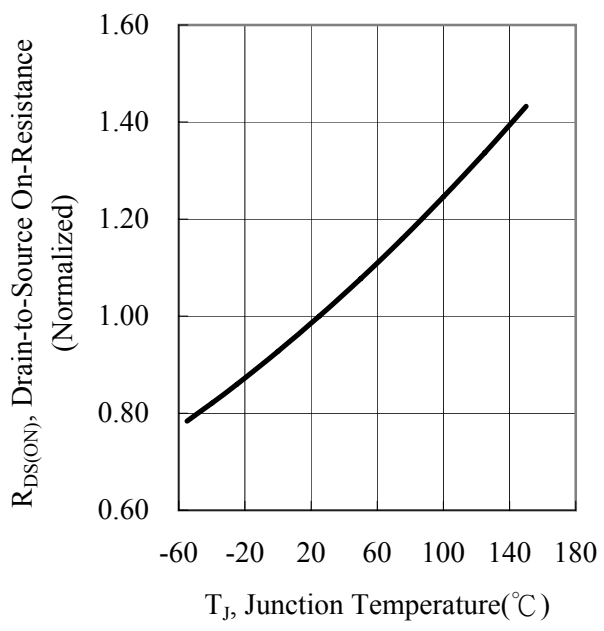
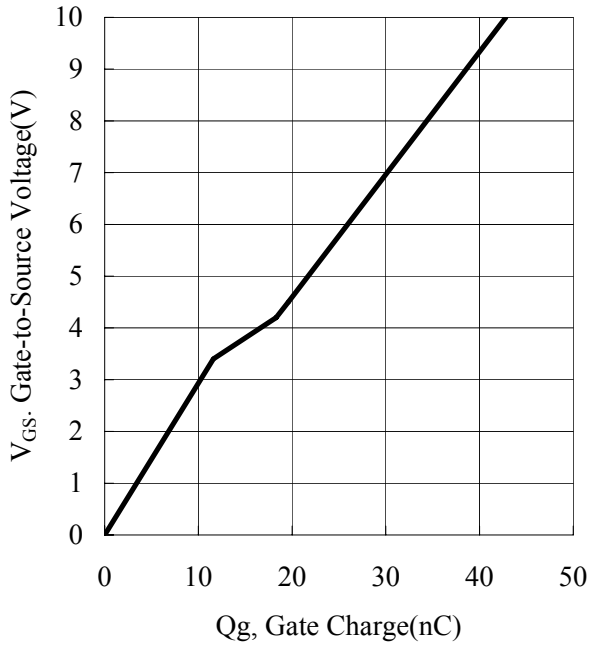
5. Gate Threshold Voltage



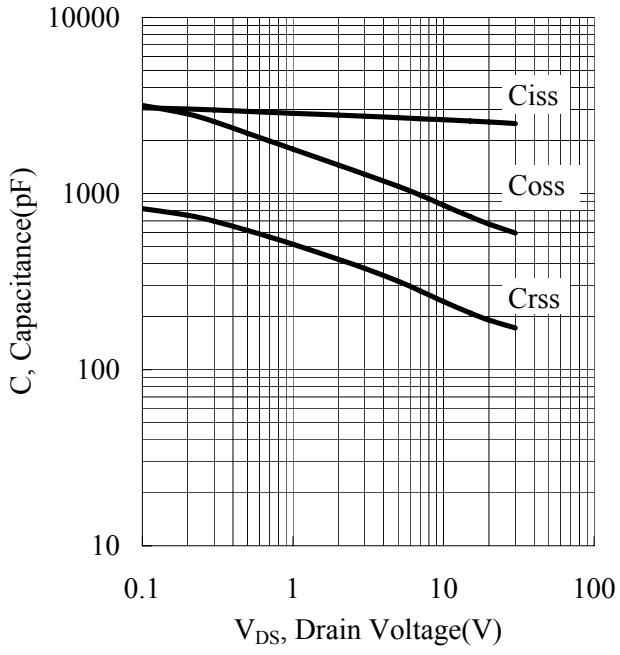
6. Drain-to-Source On-Resistance



7. Typ. Gate Charge



8. Typ. Capacitance



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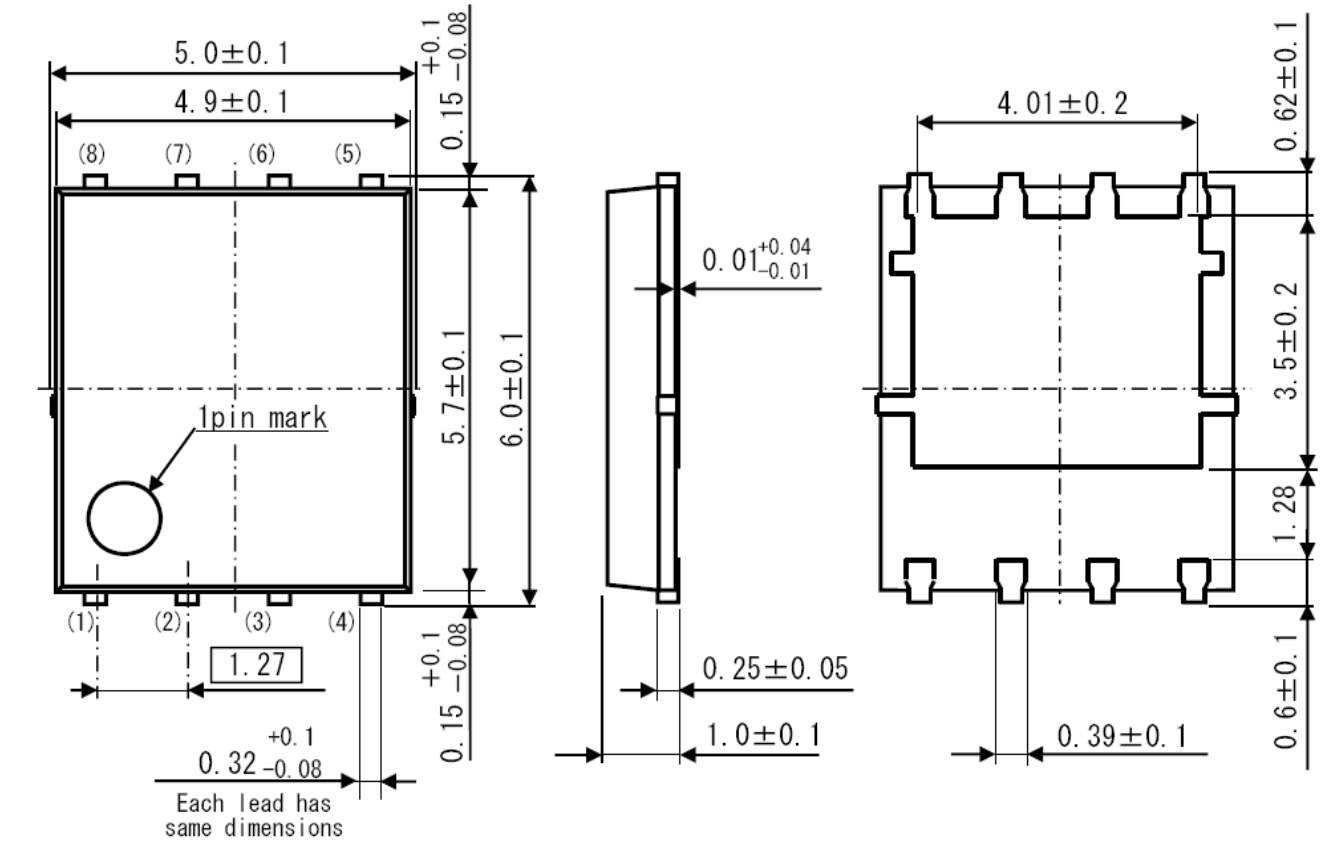
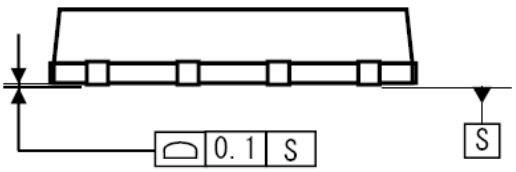
PowerPAK

1. Outline Dimension





UNIT : mm

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