30V N-ch Power MOSFET

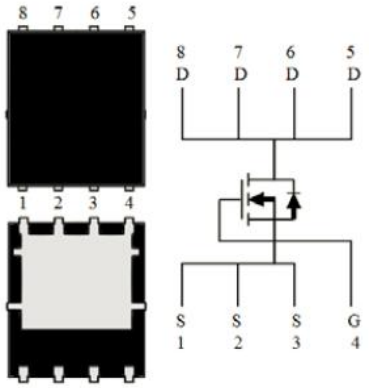
General Features

- Proprietary Advanced Trench Technology
- $R_{DS(ON),typ.}$=6.7mΩ@V_{GS}=10V
- Ultra-low Gate Charge Minimize Switching Loss
- Optimized Breakdown Ruggedness

BV_{DSS}	$R_{DS(ON),max.}$	I_D[1]
30V	8.8mΩ	15A

Applications

- High efficiency Switching



Ordering Information

Part Number	Package	Marking
MXP30N8P8UG	MaxPAK(5x6)	MXP30N8P8UG

Absolute Maximum Ratings

T_A=25℃ unless otherwise specified

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-to-Source Voltage	30	V
V_{GSS}	Gate-to-Source Voltage	±20	
I_D	Continuous Drain Current	15	A
	Continuous Drain Current at T_C=25℃	40	
	Continuous Drain Current at T_C=100℃	31	
I_{DM}	Pulsed Drain Current at V_{GS}=10V[2]	60	
E_{AS}	Single Pulse Avalanche Energy (V_{DD}=15V, R_G=25Ω, L=0.1mH)	17	mJ
P_D	Power Dissipation[3]	3.0	W
	Power Dissipation at T_C=25℃	22	
	Derating Factor above 25℃	0.024	W/℃
T_J& T_{STG}	Operating and Storage Temperature Range	-55 to 150	℃

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case			5.6	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient[3]			41.7	

Electrical Characteristics

OFF Characteristics

T_J =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{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
I_{GSS}	Gate-to-Source Leakage Current			±100	nA	V_{GS}=±20V, V_{DS}=0V

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[4]	--	6.7	8.8	mΩ	V_{GS}=10V, I_D=15A
		--	8.8	13.3		V_{GS}=4.5V, I_D=15A
$V_{GS(TH)}$	Gate Threshold Voltage	1.2	--	2.5	V	V_{DS} = V_{GS}, I_D=1mA

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance		0.59		nF	V_{GS}=0V, V_{DS}=15V, f=1.0MHz
C_{rss}	Reverse Transfer Capacitance		0.04			
C_{oss}	Output Capacitance		0.16			
R_g	Gate Series Resistance		2.3		Ω	f=1.0MHz
Q_g	Total Gate Charge[4]		10.0		nC	V_{DD}=15V, I_D=15A, V_{GS}=10V
			4.8			V_{DD}=15V, I_D=15A, V_{GS}=4.5V
Q_{gs}	Gate-to-Source Charge[4]		2.3			
Q_{gd}	Gate-to-Drain (Miller) Charge[4]		1.1			

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time[4]		9.6		ns	V_{DD}=15V I_D=7.5A V_{GS}=10V R_G=10Ω
t_{rise}	Rise Time[4]		4.5			
$t_{d(off)}$	Turn-off Delay Time[4]		25.5			
t_{fall}	Fall Time[4]		3.4			

Source-Drain Body Diode Characteristics

T_J=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage[4]			1.2	V	I_S=2.5A, V_{GS}=0V
t_{rr}	Reverse Recovery Time[4]		21.4		ns	V_{GS}=0V I_S=15A,di/dt=100A/μs
Q_{rr}	Reverse Recovery Charge[4]		11.8		nC	

Note:

[1] T_C=25℃, Limited only by maximum temperature allowed.
[2] P_W≦10μS, Duty cycle≦1%.
[3] Mounted on a Cu board (40x40x0.8mm)
[4] Pulsed

Typical Characteristics

Fig.1 Power Dissipation Derating Curve

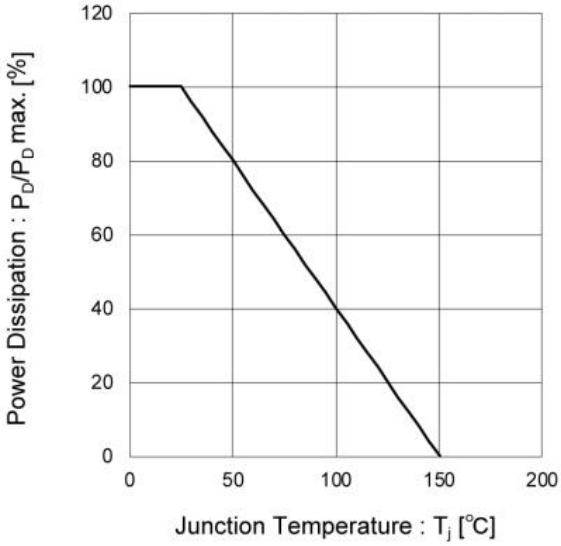


Fig.2 Maximum Safe Operating Area

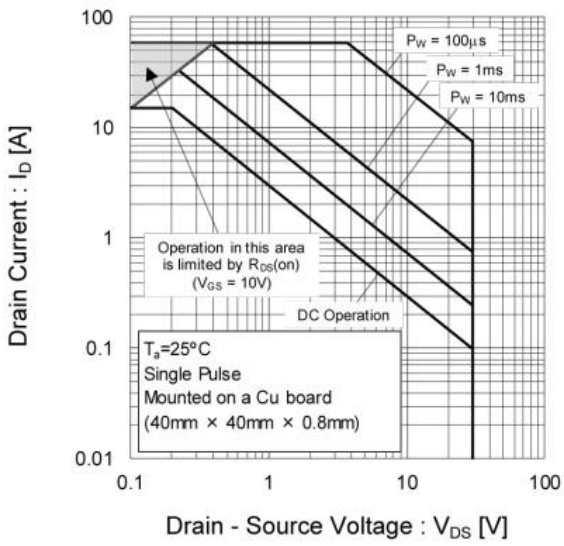


Fig.3 Normalized Transient Thermal Resistance vs. Pulse Width

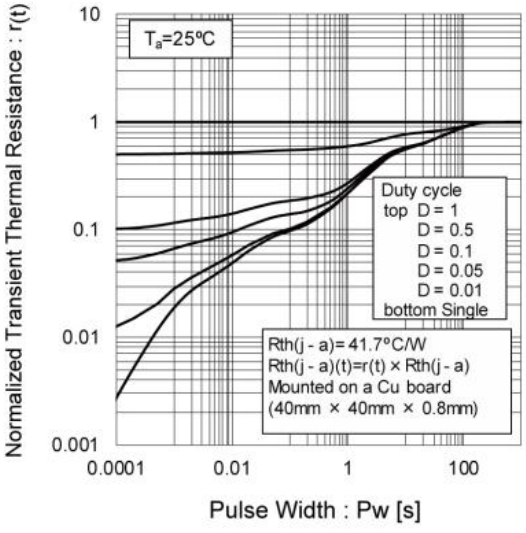


Fig.4 Single Pulse Maximum Power dissipation

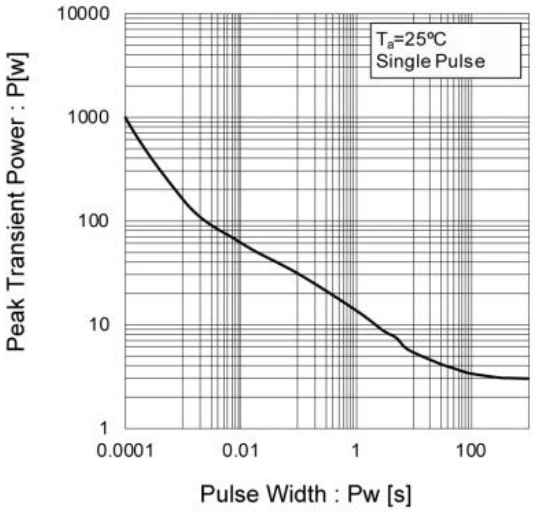


Fig.5 Typical Output Characteristics(I)

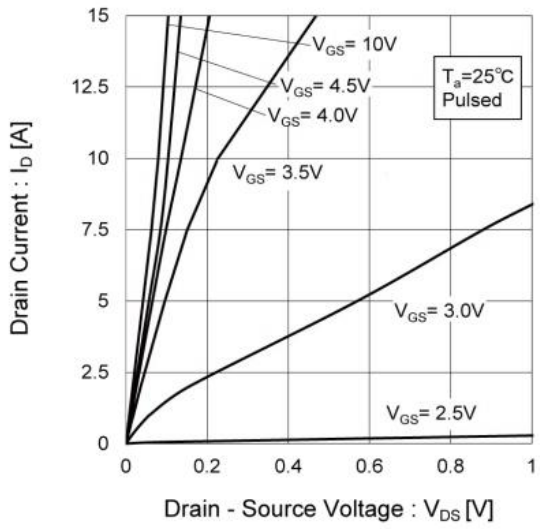


Fig.6 Typical Output Characteristics(II)

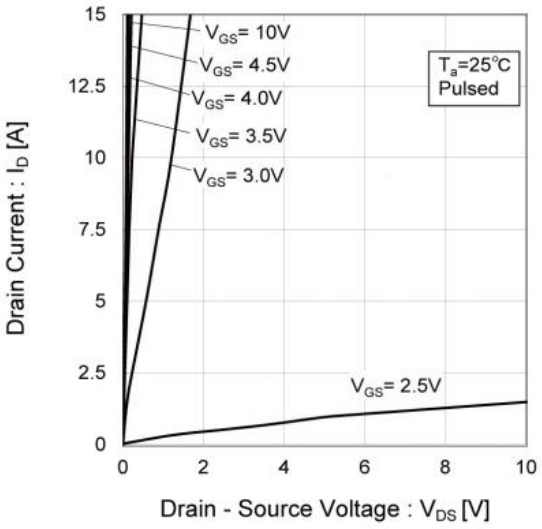


Fig.7 Breakdown Voltage vs. Junction Temperature

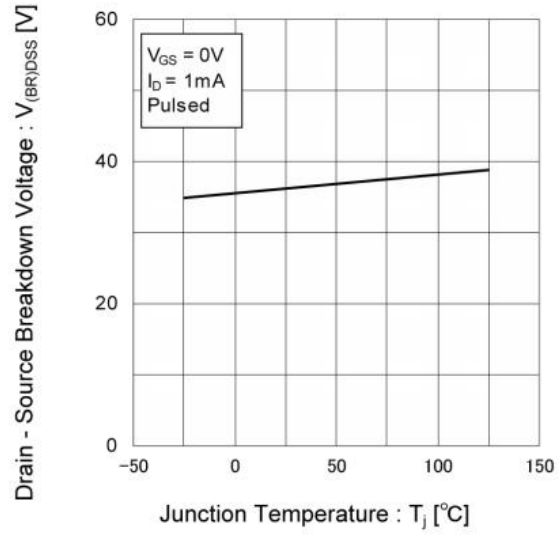


Fig.8 Typical Transfer Characteristics

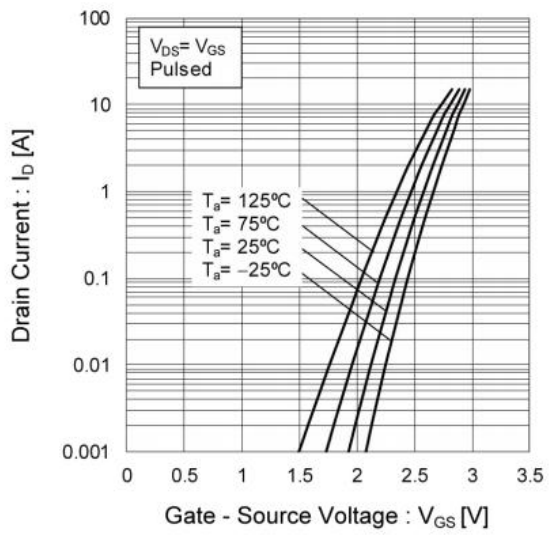


Fig.9 Gate Threshold Voltage vs. Junction Temperature

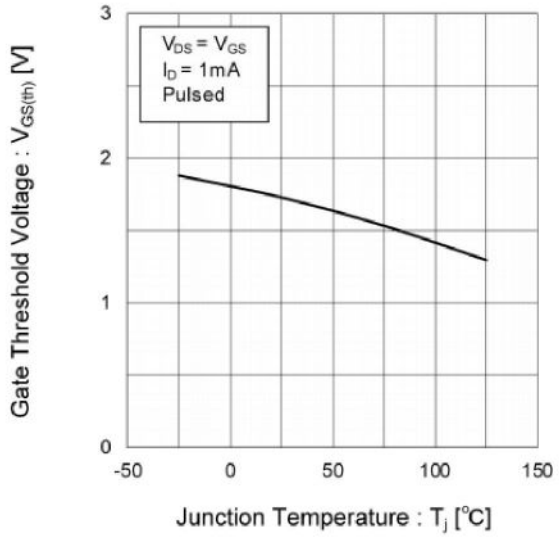


Fig.10 Forward Transfer Admittance vs. Drain Current

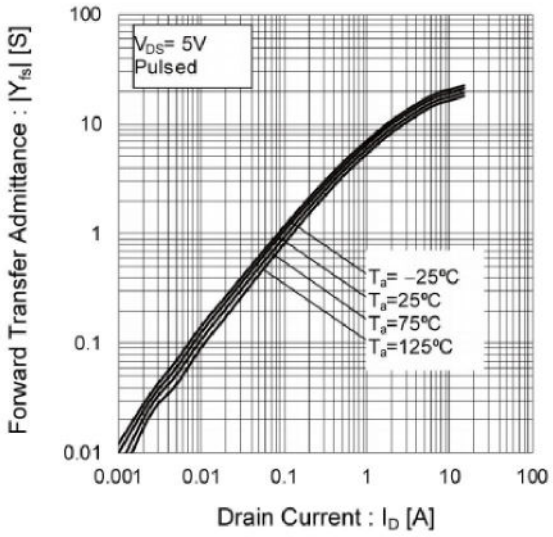


Fig.11 Drain Current Derating Curve

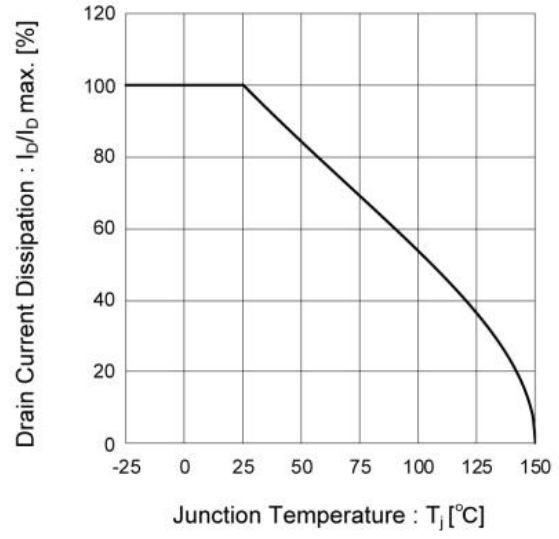


Fig.12 Static Drain - Source On - State Resistance vs. Gate Source Voltage

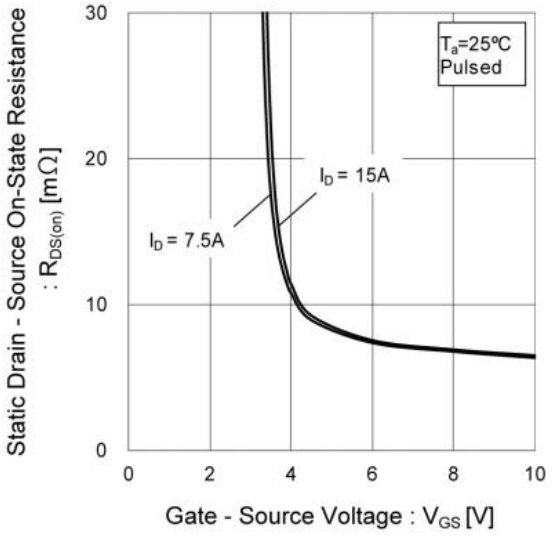


Fig.13 Static Drain - Source On - State Resistance vs. Junction Temperature

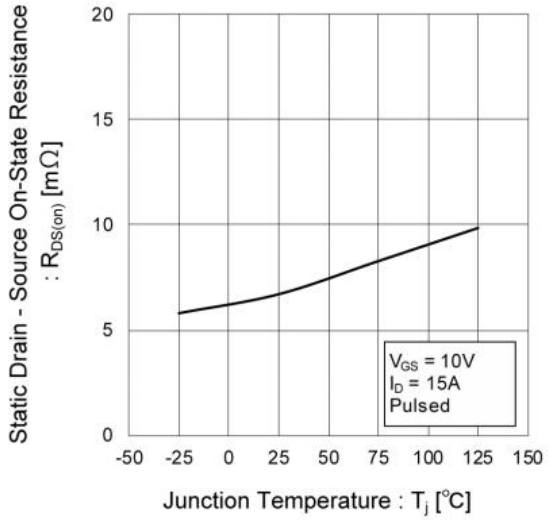


Fig.14 Static Drain - Source On - State Resistance vs. Drain Current (I)

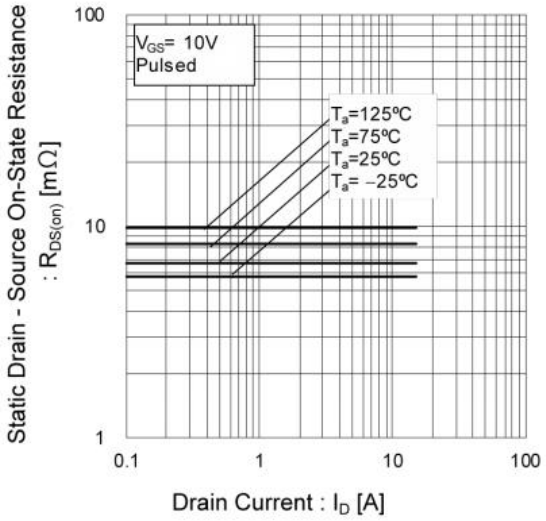


Fig.15 Static Drain - Source On - State Resistance vs. Drain Current (II)

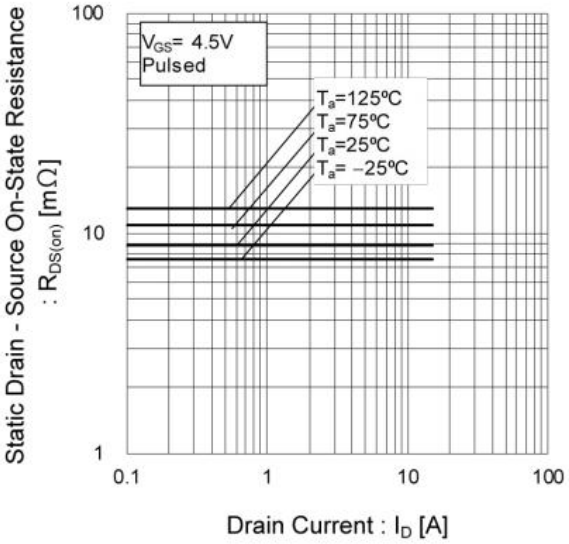


Fig.16 Typical Capacitance vs. Drain - Source Voltage

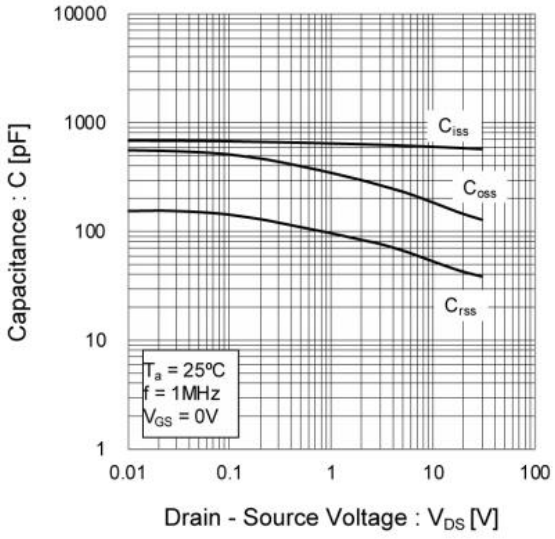


Fig.17 Switching Characteristics

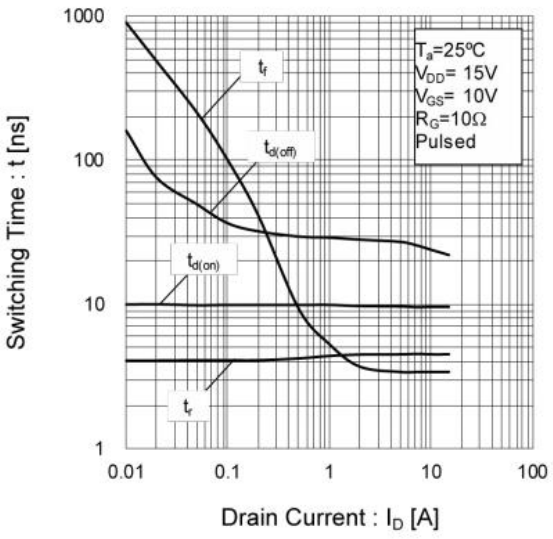


Fig.18 Dynamic Input Characteristics

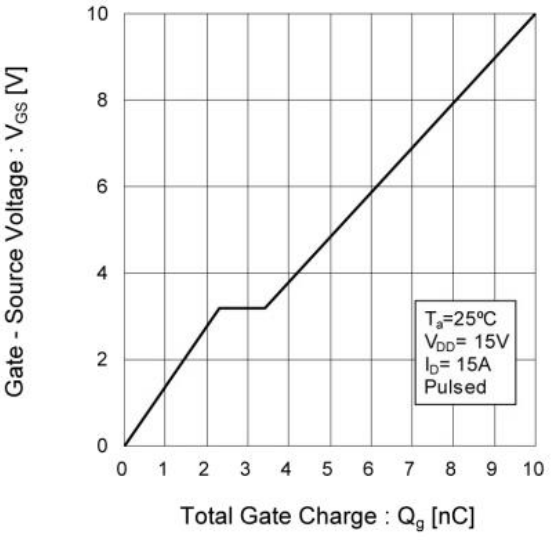
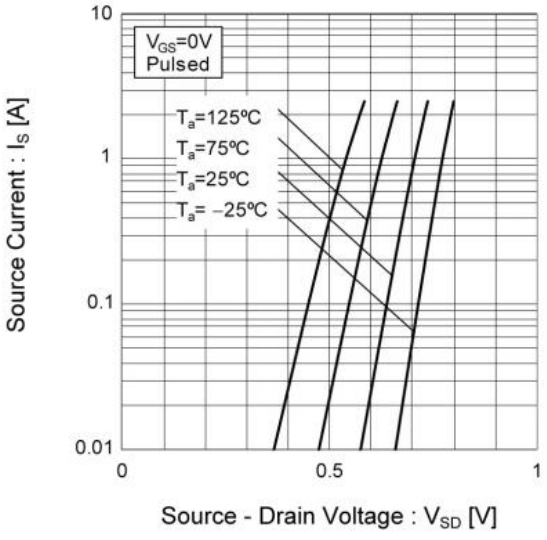
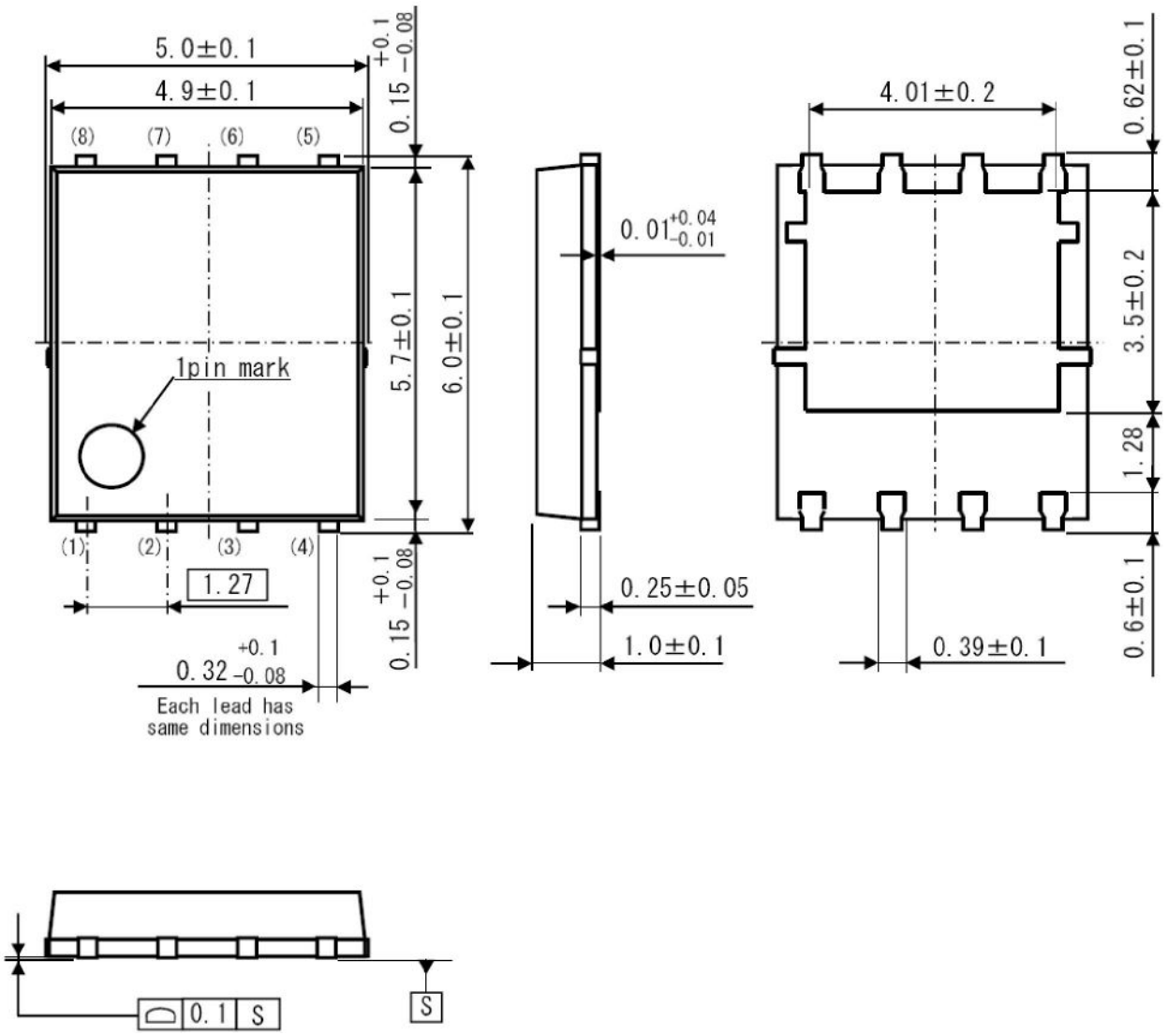


Fig.19 Source Current vs. Source Drain Voltage



Package Dimensions

MaxPAK 5x6



UNIT:mm

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