MXP6006DT Datasheet

60V N-Channel MOSFET

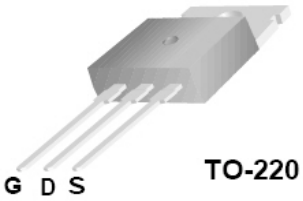
Applications:

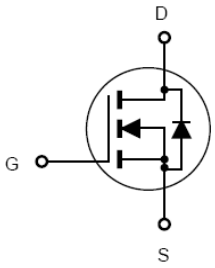
- Power Supply
- DC-DC Converters

V_{DS}	$R_{DS(ON)}$(MAX)	I_D[a]
60V	6mΩ	115A

Features:

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





Ordering Information

Park Number	Package	Brand
MXP6006DT	TO-220	MXP

Absolute Maximum Ratings

T_C=25℃ unless otherwise specified

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-to-Source Voltage	60	V
I_D[a]	Continuous Drain Current	115	A
I_{DM}	Pulsed Drain Current @V_G=10V	459	
P_D	Power Dissipation	158	W
	Derating Factor above 25℃	1.05	W/℃
V_{GS}	Gate-to-Source Voltage	+/-20	V
E_{AS}	Single Pulse Avalanche Energy (L=1mH)	449	mJ
I_{AS}	Pulsed Avalanche Energy	Figure 9	A
T_j and T_{stg}	Operating Junction and Storage Temperature Range	-55 to 175	℃

Thermal Resistance

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
$R_{\theta JC}$	Junction-to-Case	-	-	0.95	℃/W	Water cooled heatsink, P_D adjusted for a peak junction Temperature of 175℃

Note:

a: Calculated continuous current based upon maximum allowable junction temperature +175℃. Package limitation current is 80A.

OFF Characteristics

T_J=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	60	-	-	V	V_{GS}=0V, I_D=250uA
I_{DSS}	Drain-to-Source Leakage Current	-	-	1	uA	V_{DS}=48V, V_{GS}=0V
		-	-	100		V_{DS}=48V, 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	-	4.6	6.0	mΩ	V_{GS}=10V, I_D=24A
$V_{GS(th)}$	Gate Threshold Voltage.	2	-	4	V	V_{GS}=V_{DS}, I_D=250uA

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
Ciss	Input Capacitance	-	5117	-	pF	V_{GS}=0V, V_{DS}=25V, f=1.0MHz
Coss	Output Capacitance	-	534	-		
Crss	Reverse Transfer Capacitance	-	185	-		
Qg	Total Gate Charge	-	68	-	nC	V_{DD}=30V, I_D=57A, V_{GS}=10V
Qgs	Gate-to-Source Charge	-	25	-		
Qgd	Gate-to-Drain ("Miller") Charge	-	16	-		
Td(on)	Turn-on Delay Time	-	18	-	nS	VDD=30V, ID=57A, V_G=10V, R_G=2.5Ω
Tr	Rise Time	-	43	-		
Td(off)	Turn-off Delay Time	-	46	-		
Tf	Fall Time	-	13	-		

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=24A, V_{GS}=0V
Trr	Reverse Recovery Time	-	-	108.3	nS	Is=38A, di/dt=100A/μs
Qrr	Reverse Recovery Charge	-	-	85.4	nC	

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Figure 1. Maximum Power Dissipation V.S Case Temperature

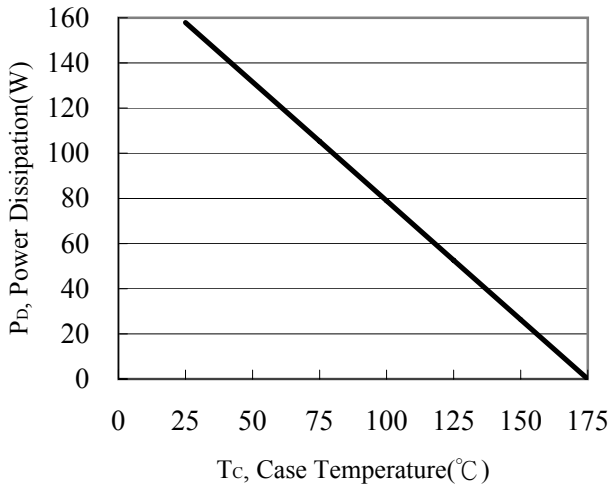


Figure 2. Maximum Continuous Drain Current V.S Case Temperature

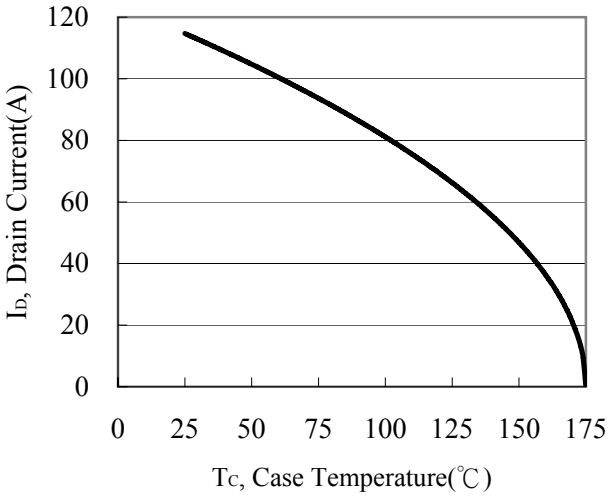


Figure 3. Typical Output Characteristics

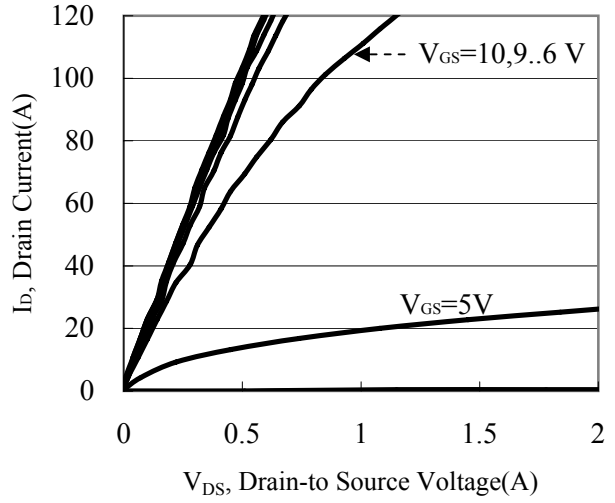


Figure 4. Breakdown Voltage V.S Junction Temperature

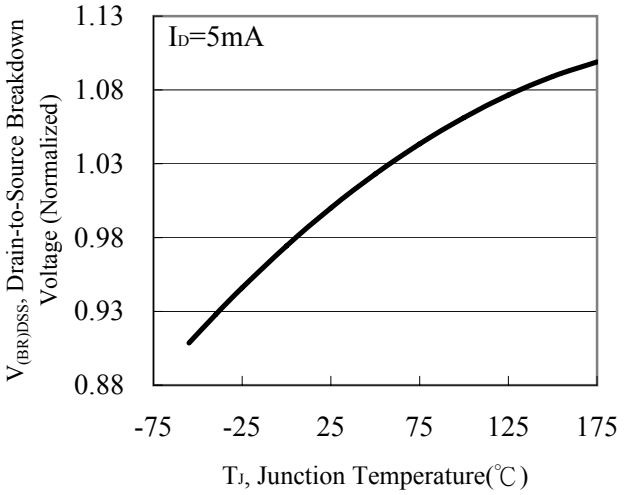


Figure 5. Threshold Voltage V.S Junction Temperature

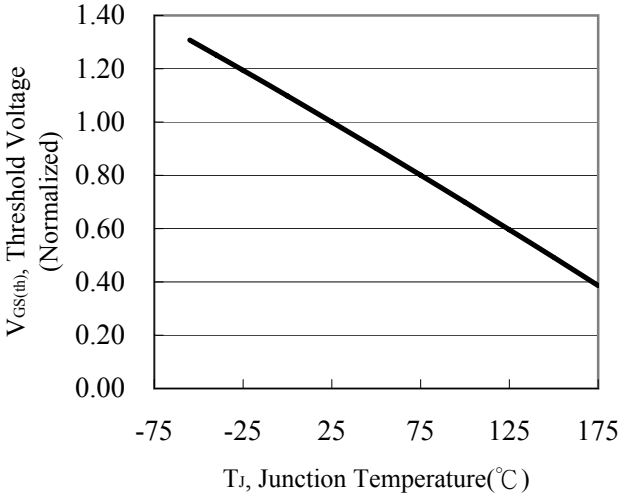


Figure 6. Drain-to-Source Resistance V.S Junction Temperature

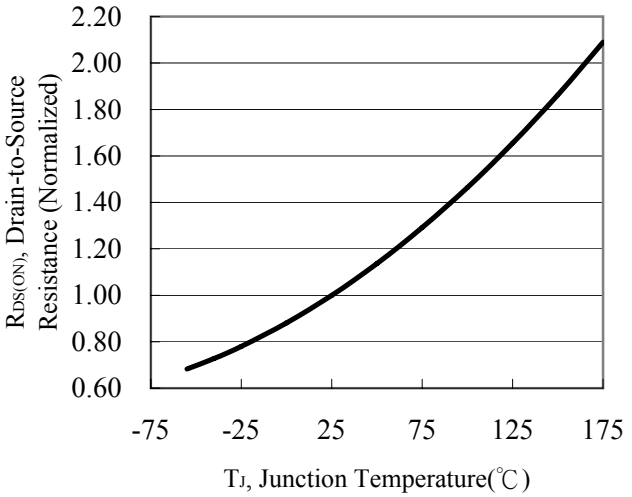


Figure 7. Typical Gate Charge vs. Gate-to-Source Voltage

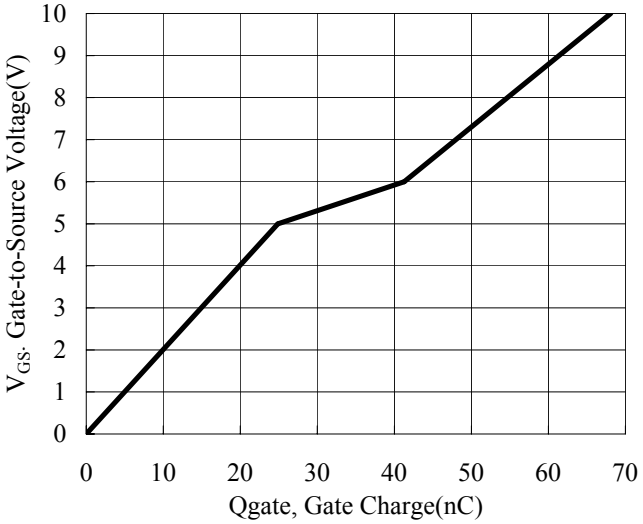


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

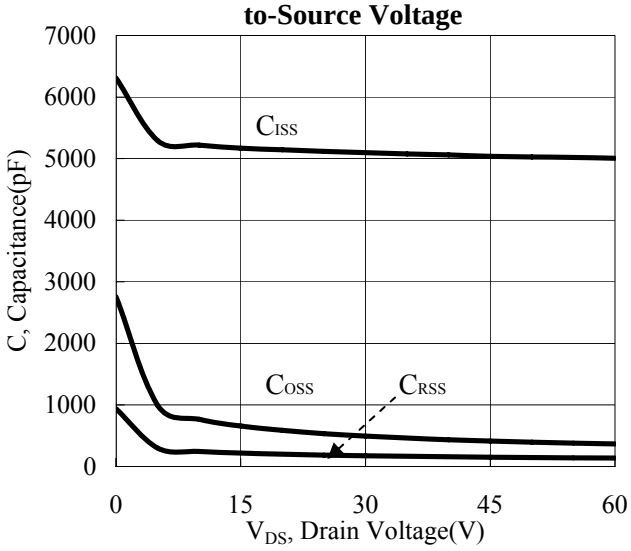


Figure 9. Unclamped Inductive Switching Capability

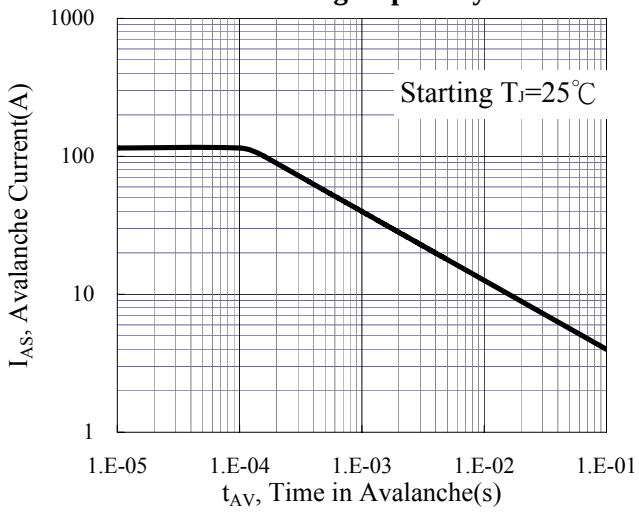
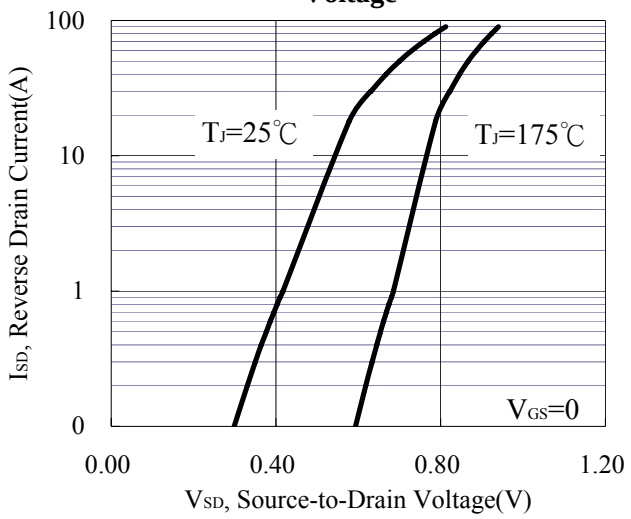


Figure 10. Source-Drain Diode Forward Voltage



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