40VN-ChannelMOSFET

General Features:

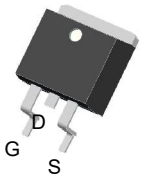
- Proprietary New Trench Technology
- $R_{DS(ON)}$=1.9mΩ at V_{GS}=10V
- LowGateChargeMinimize Switching Loss

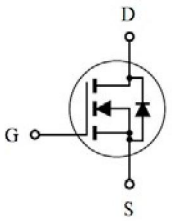
BV_{DSS}	40V
$R_{DS(on)}$ at10V(Max.)	1.9mΩ
I_D[2]	247A

Applications:

- High efficiencyDC/DCConverters
- Synchronous Rectification
- UPS Inverter

TO-263-2L





OrderingInformation

PartNumber	Package	Marking
MXP4002JFL	TO-263	MXP4002JFL

AbsoluteMaximumRatings

T_a=25℃unlessotherwisespecified

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-to-Source Voltage[1]	40	V
V_{GSS}	Gate-to-Source Voltage	±20	
I_D	Continuous Drain Current[2]	247	A
	Continuous Drain Current[3]	192	
	Continuous Drain Current at T_C=100℃[2]	185	
I_{DM}	Pulsed Drain Current at V_{GS}=10V[2,4]	1023	
E_{AS}	Single Pulse Avalanche Energy (V_{DD}=30V, V_{GS}=10V, R_G=25Ω, L=1mH)	680	mJ
P_D	Power Dissipation	212	W
	Derating Factor above 25℃	1.41	W/℃
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	℃
T_J& T_{STG}	Operating and StorageTemperatureRange	-55 to 175	

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

ThermalResistance

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	ThermalResistance,Junction-to-Case	0.71	℃/W

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OFFCharacteristics

T_a=25℃unlessotherwisespecified

Symbol	Parameter	Min	Typ	Max	Unit	TestConditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	40	-	-	V	V_{GS}=0V,I_D=250uA
I_{DSS}	Drain-to-SourceLeakageCurrent	-	-	1	uA	V_{DS}=32V,V_{GS}=0V
I_{GSS}	Gate-to-SourceForwardLeakage	-	-	+/-100	nA	V_{GS}=+/-20V, V_{DS}=0V

ONCharacteristics

T_a=25℃unlessotherwisespecified

Symbol	Parameter	Min	Typ	Max	Unit	TestConditions
$R_{DS(ON)}$	StaticDrain-to-SourceOn-Resistance	-	2.0	2.3	mΩ	V_{GS}=4.5V,I_D=192A[4]
			1.6	1.9	mΩ	V_{GS}=10V,I_D=192A[4]
$V_{GS(th)}$	GateThresholdVoltage	1.0	-	3.0	V	V_{GS}=V_{DS},I_D=250uA

DynamicCharacteristics

T_a=25℃unlessotherwisespecified

Symbol	Parameter	Min	Typ	Max	Unit	TestConditions
C_{iss}	InputCapacitance	-	6.79	-	nF	V_{GS}=0V,V_{DS}=25V,f=1.0MHz
C_{oss}	OutputCapacitance	-	0.92	-		
C_{rss}	ReverseTransferCapacitance	-	0.56	-		
Q_g	TotalGateCharge	-	120	-	nC	V_{DD}=20V,I_D=192A, V_{GS}=10V
Q_{gs}	Gate-to-SourceCharge	-	12.4	-		
Q_{gd}	Gate-to-Drain("Miller")Charge	-	27.0	-		
$T_{d(on)}$	Turn-onDelayTime	-	8	-	ns	V_{DD}=20V,I_D=96A,V_{GS}=10V, R=10Ω
T_r	RiseTime	-	24	-		
$T_{d(off)}$	Turn-offDelayTime	-	179	-		
T_f	FallTime	-	92	-		

Source-DrainDiodeCharacteristics

T_a=25℃unlessotherwisespecified

Symbol	Parameter	Min	Typ	Max	Unit	TestConditions
I_{SD}	Continuous Source Current[2]	-	-	247	A	Maximum Ratings
V_{SD}	DiodeForwardVoltage	-	-	1.2	V	I_S=192A,V_{GS}=0V
T_{rr}	ReverseRecoveryTime	-	43	-	ns	V_{GS}=0V I_F=20A,di/dt=100A/μs
Q_{rr}	ReverseRecoveryCharge	-	28	-	nC	

Note:

[1]T_J =+25˚C to +175˚C
[2]Silicon limited current only
[3]Package limited current
[4]Pulse width ≤ 380us; duty cycle ≤ 2%

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Fig.1 Typical Output Characteristic

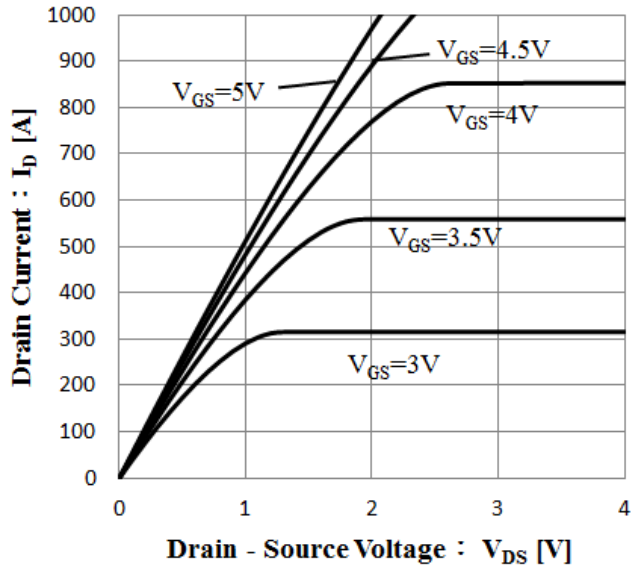

Fig.2 Typical breakdown voltage

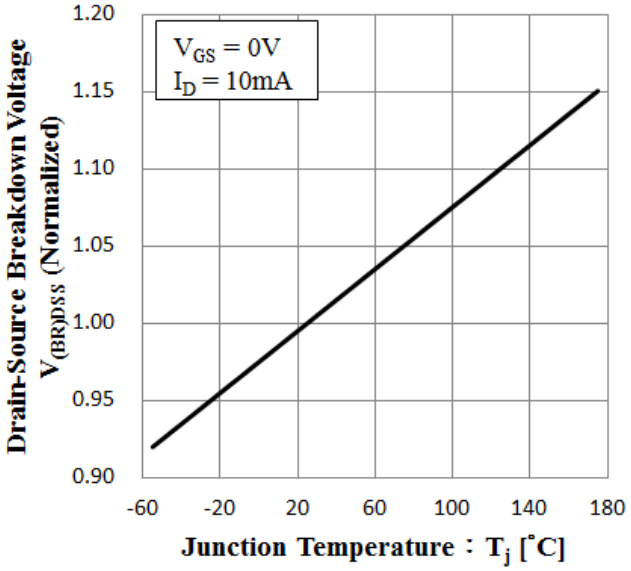

Fig.3 Static Drain-Source On- State Resistance vs. Gate Source Voltage

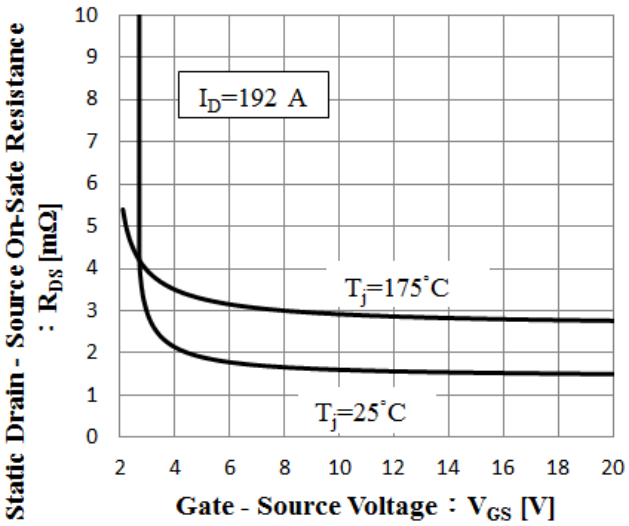

Fig.4 Gate Threshold Voltage vs Junction Temperature

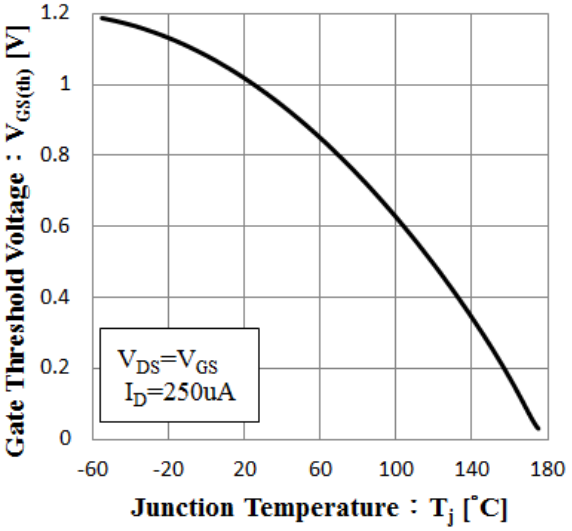

Fig.5 Static Drain – Source On – State Resistance vs. Drain Current

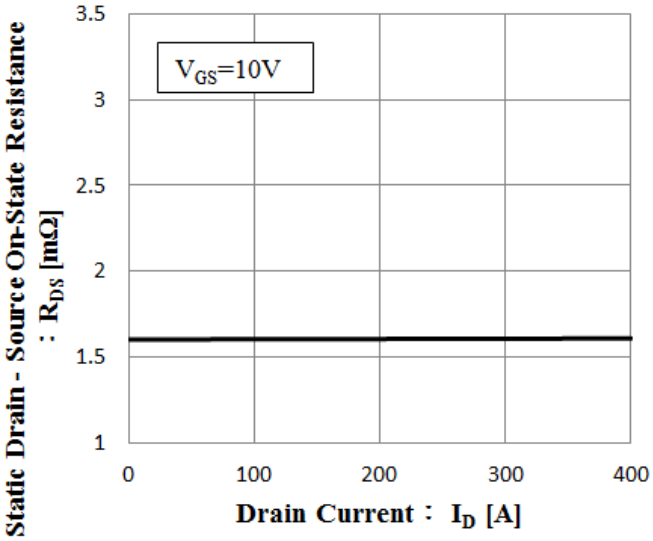

Fig.6 Static Drain – Source On – State Resistance vs. Junction Temperature

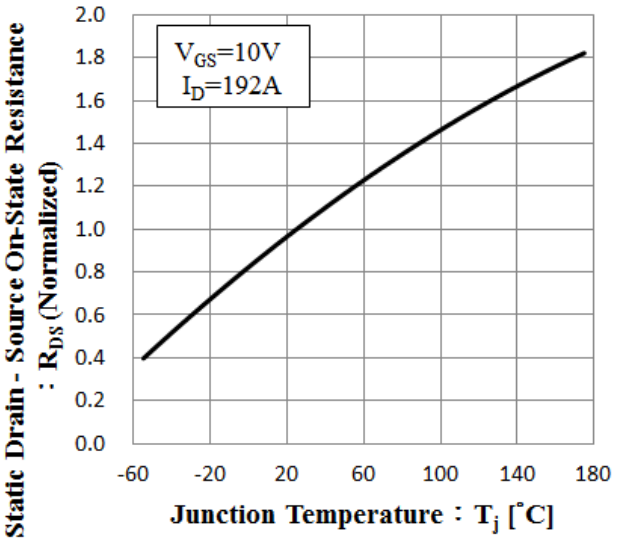

Fig.7 Typical Capacitance vs. Drain Source Voltage

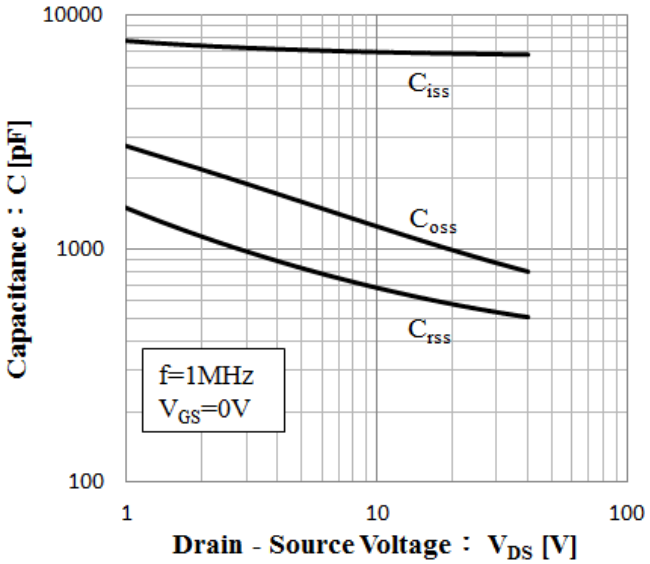

Fig.8 Typical Gate Charge vs. Gate-to-Source Voltage

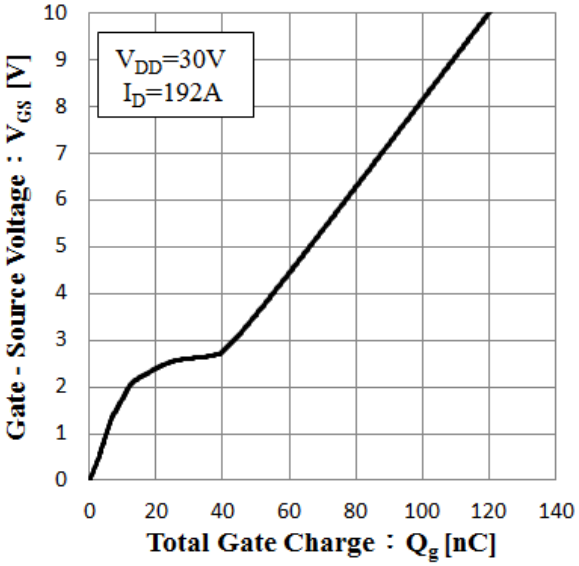

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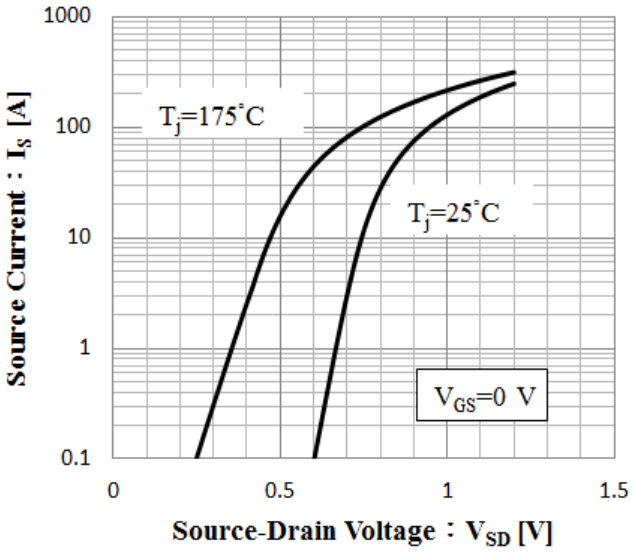
Fig.9 Typical Body Diode Transfer Characteristics



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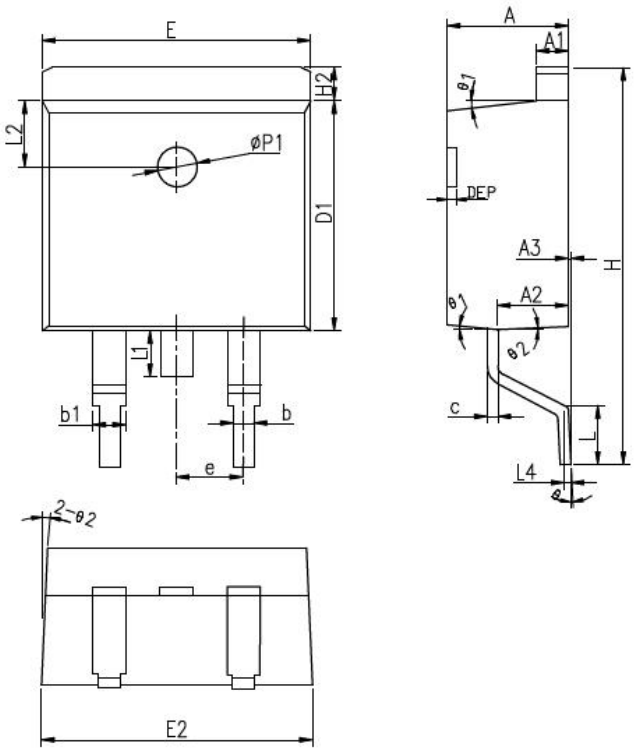
1. OutlineDimension



COMMON DIMENSIONS

SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.22	1.27	1.32	0.048	0.050	0.052
A2	2.59	2.69	2.79	0.102	0.106	0.110
A3	0.00	0.10	0.20	0.000	0.004	0.008
b	0.77	0.813	0.90	0.030	0.032	0.035
b1	1.20	1.270	1.36	0.047	0.050	0.054
c	0.34	0.381	0.47	0.013	0.015	0.019
D1	8.60	8.70	8.80	0.339	0.343	0.346
E	10.00	10.16	10.26	0.394	0.400	0.404
E2	10.00	10.10	10.20	0.394	0.398	0.402
e		2.54 BSC			0.100 BSC	
H	14.70	15.10	15.50	0.579	0.594	0.610
H2	1.17	1.27	1.40	0.046	0.050	0.055
L	2.00	2.30	2.60	0.079	0.091	0.102
L1	1.45	1.55	1.70	0.057	0.061	0.067
L2		2.50 REF			0.098 REF	
L4		0.25 BSC			0.010 BSC	
θ	0°	5°	8°	0°	5°	8°
θ1	5°	7°	9°	5°	7°	9°
θ2	1°	3°	5°	1°	3°	5°
ΦP1	1.40	1.50	1.60	0.055	0.059	0.063
DEP	0.05	0.10	0.20	0.002	0.004	0.008

UNIT:mm

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