

XP4024GEMT-HF

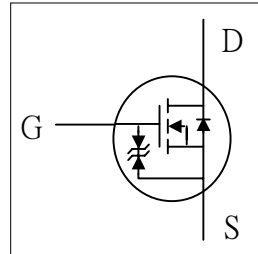
Halogen-Free Product

XSEMI

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

- ▼ Simple Drive Requirement
- ▼ SO-8 Compatible with Heatsink
- ▼ Low On-resistance
- ▼ RoHS Compliant & Halogen-Free

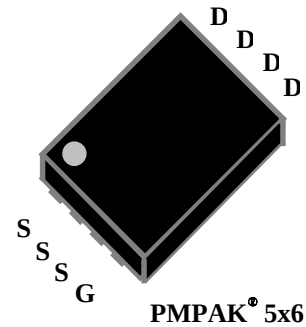


BV_{DSS}	30V
$R_{DS(ON)}$	4.5m Ω
I_D^4	60A

Description

XP4024 series are innovative design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The PMPAK[®] 5x6 package is special for DC-DC converters application and the foot print is compatible with SO-8 with backside heat sink and lower profile.



Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Drain Current (Chip), $V_{GS} @ 10V^4$	60	A
$I_D@T_A=25^\circ C$	Drain Current, $V_{GS} @ 10V^3$	26.1	A
$I_D@T_A=70^\circ C$	Drain Current, $V_{GS} @ 10V^3$	20.9	A
I_{DM}	Pulsed Drain Current ¹	160	A
$P_D@T_C=25^\circ C$	Total Power Dissipation	36.7	W
$P_D@T_A=25^\circ C$	Total Power Dissipation ³	5	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	3.4	$^\circ C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient ³	25	$^\circ C/W$

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =20A	-	3.5	4.5	mΩ
		V _{GS} =4.5V, I _D =20A	-	5	8.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.2	1.6	2.5	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =20A	-	70	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =24V, V _{GS} =0V	-	-	10	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±20V, V _{DS} =0V	-	-	±30	uA
Q _g	Total Gate Charge	I _D =20A	-	15	24	nC
Q _{gs}	Gate-Source Charge	V _{DS} =15V	-	4	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	8	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =15V	-	14	-	ns
t _r	Rise Time	I _D =1A	-	10	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =6Ω	-	33	-	ns
t _f	Fall Time	V _{GS} =10V	-	18	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1500	2400	pF
C _{oss}	Output Capacitance	V _{DS} =15V	-	320	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	210	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1.2	2.4	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =20A, V _{GS} =0V	-	-	1.2	V
t _{rr}	Reverse Recovery Time	I _S =20A, V _{GS} =0V,	-	20	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	5	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board, t ≤10sec; 60°C/W at steady state.
- 4.Package limitation current is 60A .

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

XSEMI DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT

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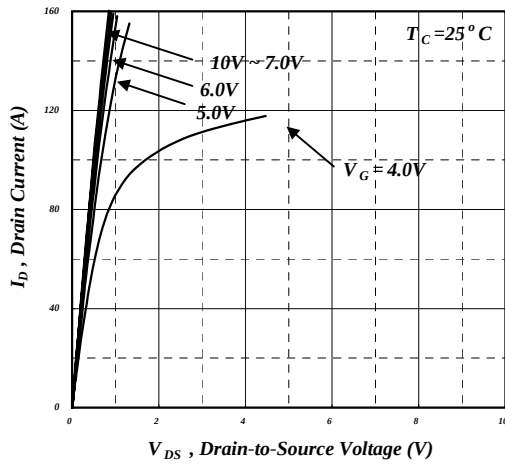


Fig 1. Typical Output Characteristics

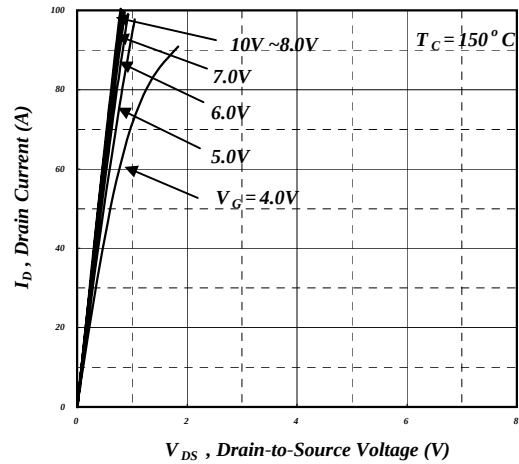


Fig 2. Typical Output Characteristics

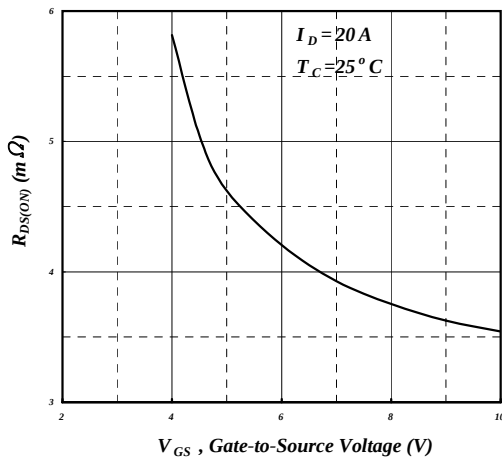


Fig 3. On-Resistance v.s. Gate Voltage

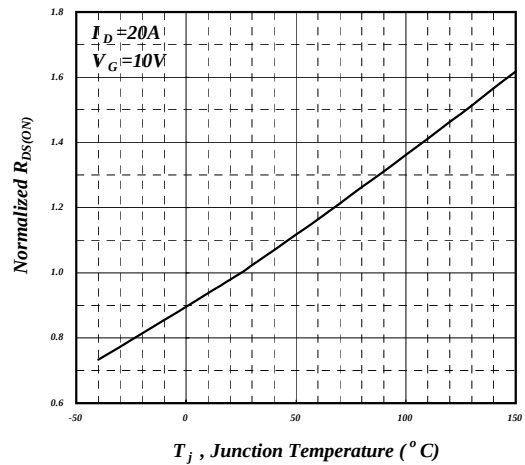


Fig 4. Normalized On-Resistance v.s. Junction Temperature

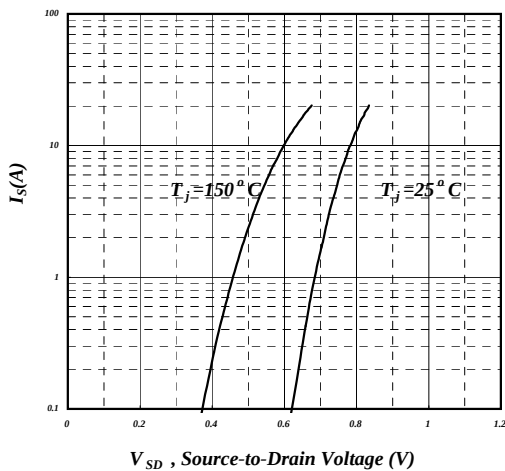


Fig 5. Forward Characteristic of Reverse Diode

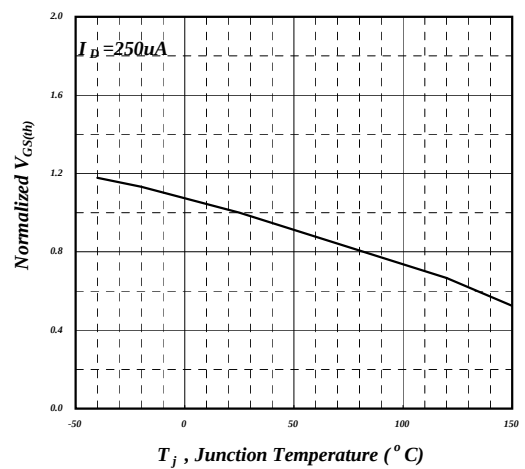
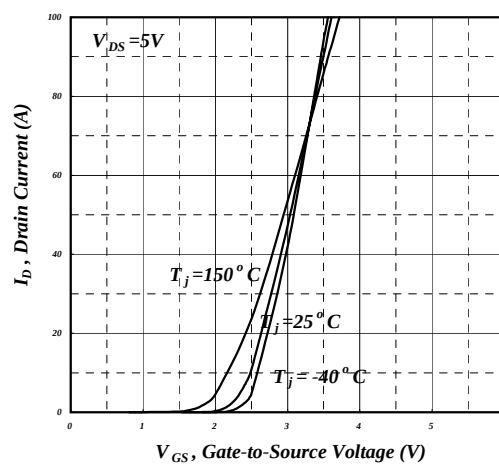
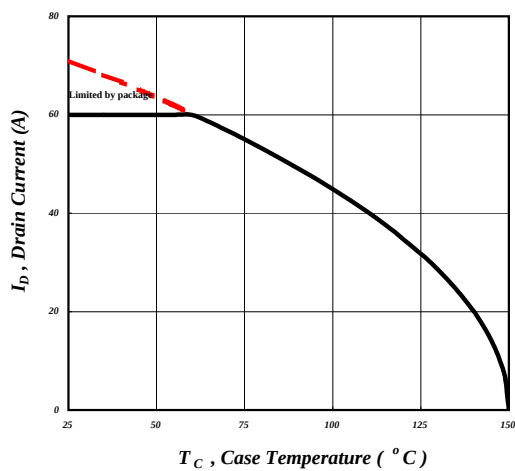
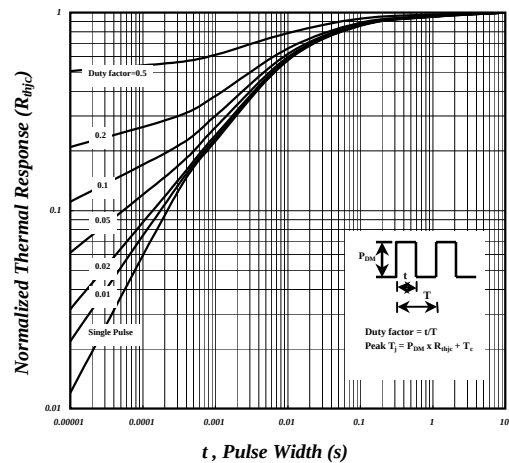
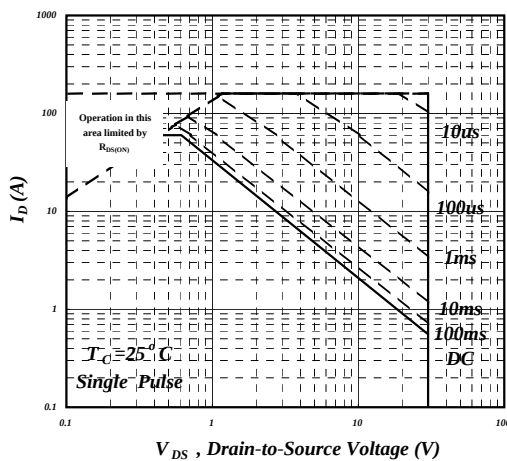
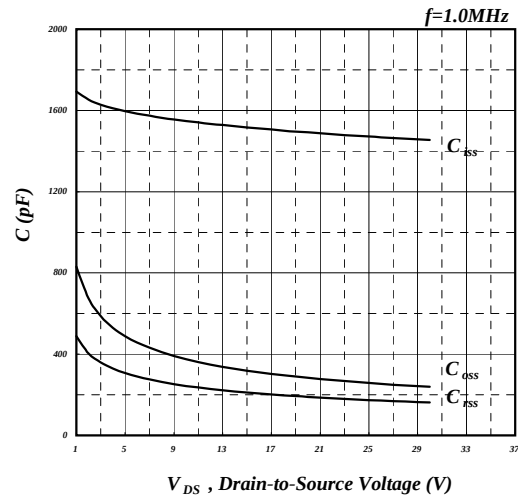
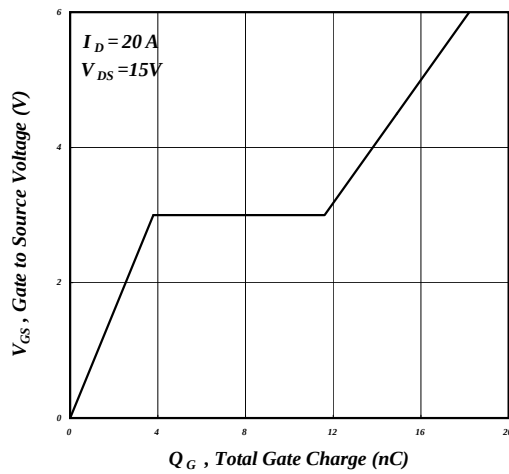


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



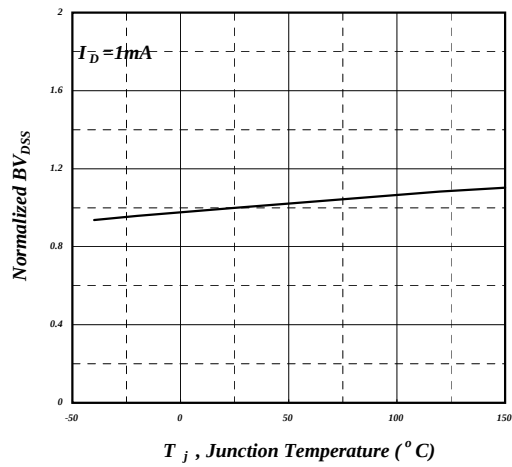


Fig 13. Normalized BV_{DSS} v.s. Junction

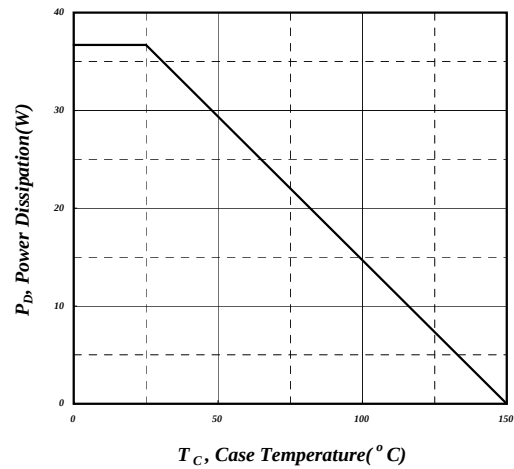


Fig 14. Total Power Dissipation

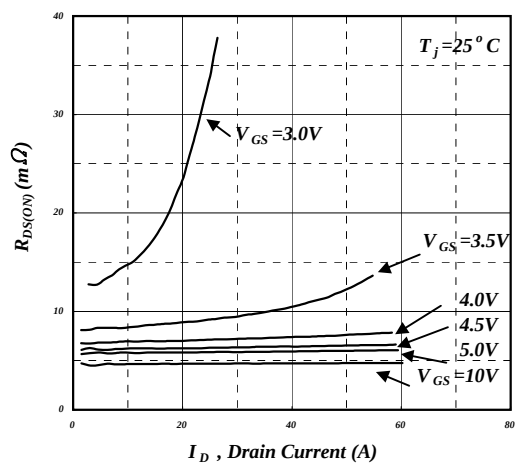
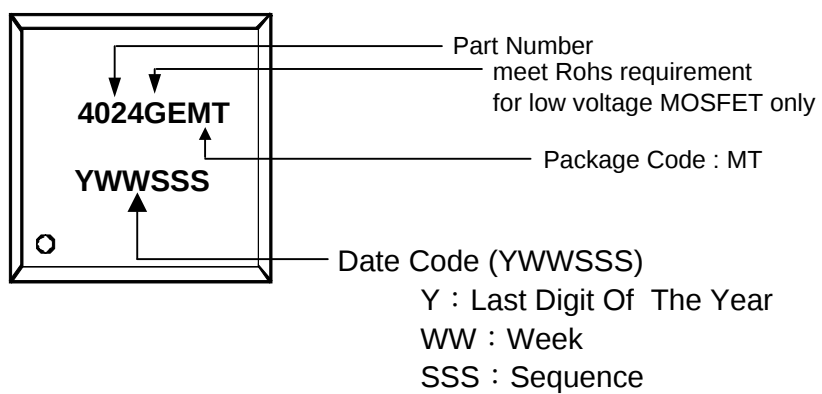


Fig 15. Typ. Drain-Source on State Resistance

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