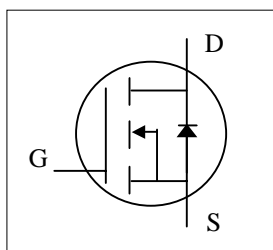
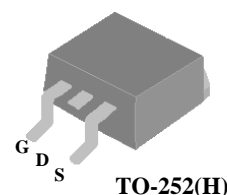


- ▼ 100% R<sub>g</sub> & UIS Test
- ▼ Low t<sub>rr</sub> / Q<sub>rr</sub>
- ▼ Simple Drive Requirement
- ▼ RoHS Compliant & Halogen-Free



BV <sub>DSS</sub>	600V
R <sub>DS(ON)</sub>	0.29 Ω
I <sub>D</sub> <sup>6</sup>	13.3A



## Description

XP60SA290D series are innovated 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 TO-252 package is widely preferred for commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

## Absolute Maximum Ratings @T<sub>j</sub>=25°C (unless otherwise specified)

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	600	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
V <sub>GS</sub>	Gate-Source Voltage, AC (f > 1Hz)	±30	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Drain Current, V <sub>GS</sub> @ 10V <sup>6</sup>	13.3	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Drain Current, V <sub>GS</sub> @ 10V <sup>6</sup>	8.4	A
I <sub>DM</sub>	Pulsed Drain Current <sup>1</sup>	28	A
dv/dt	MOSFET dv/dt Ruggedness (V <sub>DS</sub> = 0 ...480V )	40	V/ns
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation	104	W
P <sub>D</sub> @T <sub>A</sub> =25°C	Total Power Dissipation <sup>5</sup>	2	W
E <sub>AS</sub>	Single Pulse Avalanche Energy <sup>3</sup>	98	mJ
dv/dt	Peak Diode Recovery dv/dt <sup>4</sup>	15	V/ns
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

## Thermal Data

Symbol	Parameter	Value	Units
R <sub>thj-c</sub>	Maximum Thermal Resistance, Junction-case	1.2	°C/W
R <sub>thj-a</sub>	Maximum Thermal Resistance, Junction-ambient (PCB mount) <sup>5</sup>	62.5	°C/W

**Electrical Characteristics @T<sub>j</sub>=25°C(unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	600	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =5.8A	-	-	0.29	Ω
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2	-	5	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =5.8A	-	6.7	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =480V, V <sub>GS</sub> =0V	-	-	100	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±1	uA
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =5A	-	30	48	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =480V	-	7	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =10V	-	14	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =300V	-	13	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =5A	-	13	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω	-	33	-	ns
t <sub>f</sub>	Fall Time	V <sub>GS</sub> =10V	-	8	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	1020	1632	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =100V	-	44	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	5	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	3.3	6.6	Ω

**Source-Drain Diode**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =5.8A, V <sub>GS</sub> =0V	-	0.8	-	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =6.6A, V <sub>GS</sub> =0V	-	125	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs	-	770	-	nC

**Notes:**

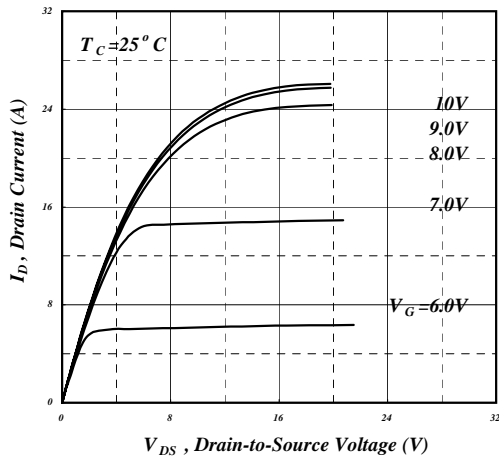
- 1.Pulse width limited by max. junction temperature.
- 2.Pulse test
- 3.Starting T<sub>j</sub>=25°C , V<sub>DD</sub>=90V , L=100mH , R<sub>G</sub>=25Ω , V<sub>GS</sub>=10V
- 4.I<sub>SD</sub> ≤ I<sub>D</sub>, V<sub>DD</sub> ≤ BV<sub>DSS</sub>, starting T<sub>J</sub> = 25°C
- 5.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board
- 6.Limited by max. junction temperature. Maximum duty cycle D=0.75

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

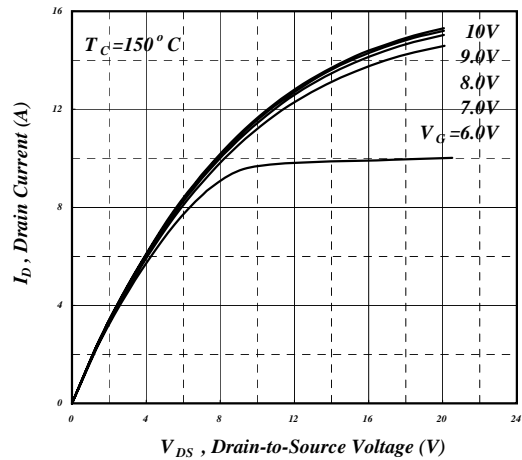
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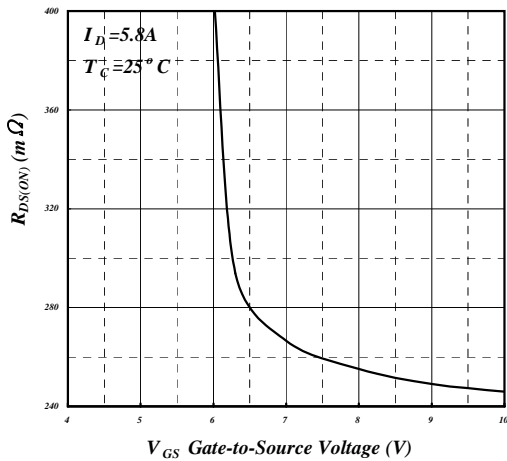
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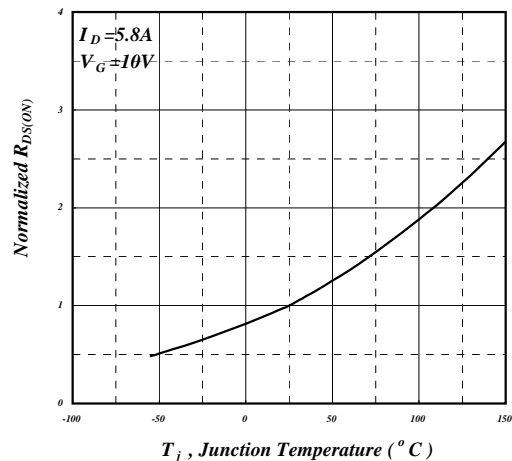
**Fig 1. Typical Output Characteristics**



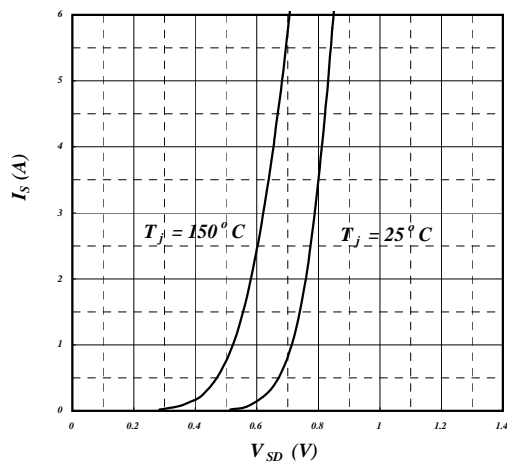
**Fig 2. Typical Output Characteristics**



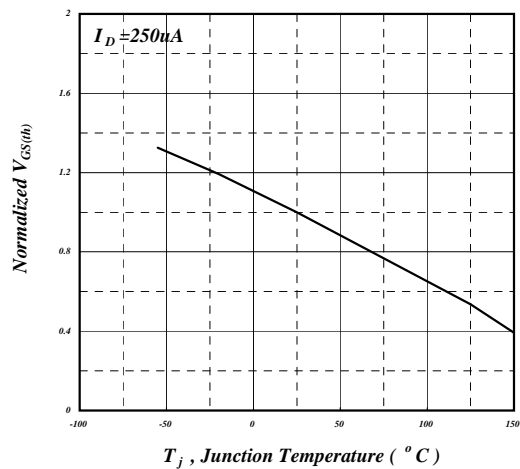
**Fig 3. On-Resistance v.s. Gate Voltage**



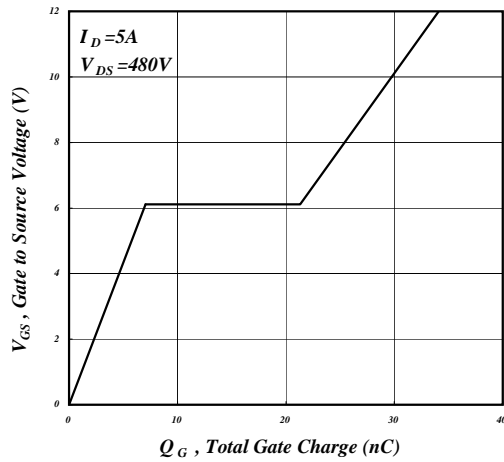
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



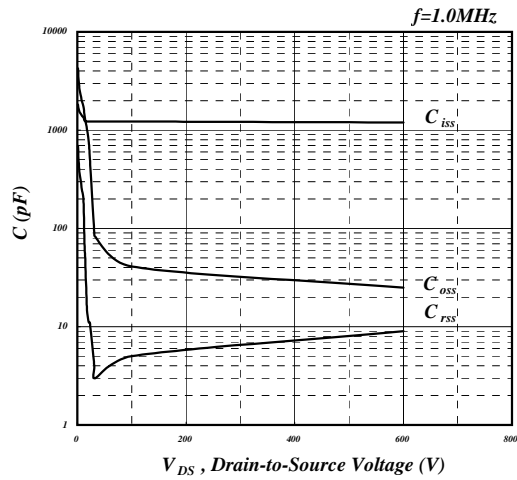
**Fig 5. Forward Characteristic of Reverse Diode**



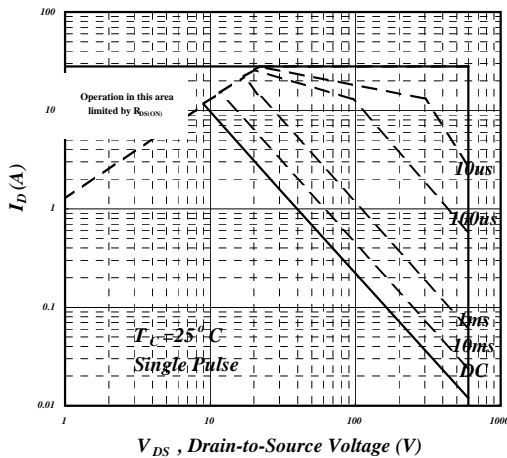
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



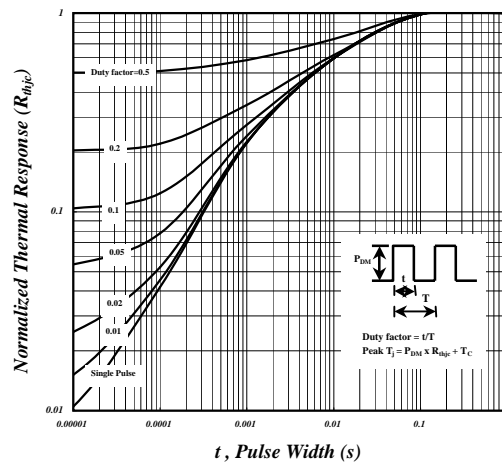
**Fig 7. Gate Charge Characteristics**



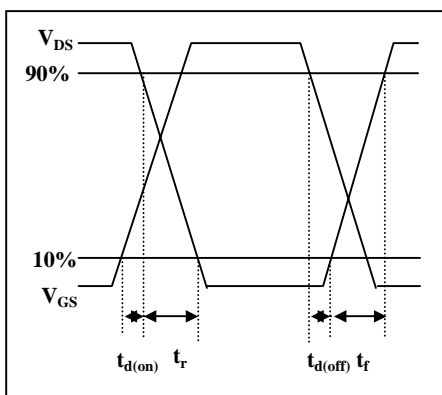
**Fig 8. Typical Capacitance Characteristics**



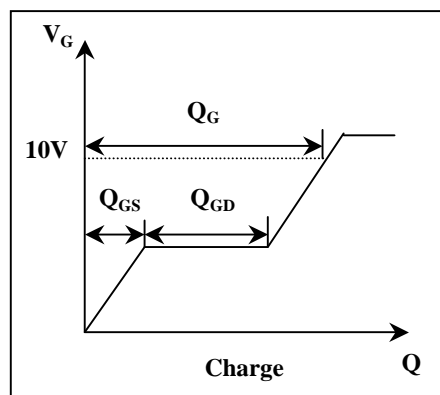
**Fig 9. Maximum Safe Operating Area**



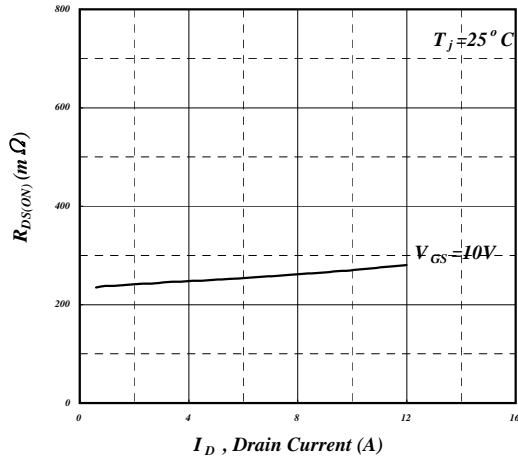
**Fig 10. Effective Transient Thermal Impedance**



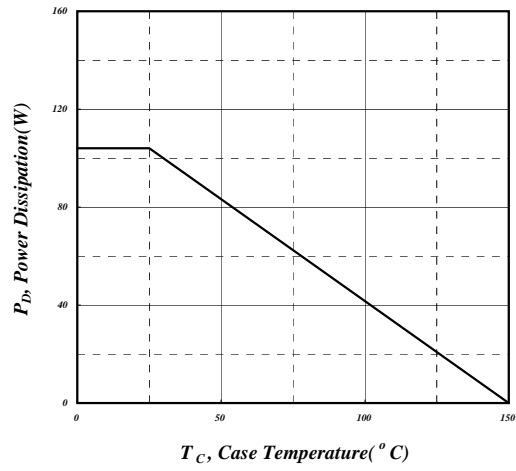
**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**



**Fig 13. Typ. Drain-Source on State Resistance**



**Fig 14. Total Power Dissipation**

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**MARKING INFORMATION**

