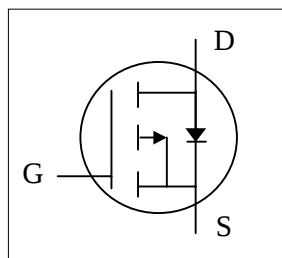
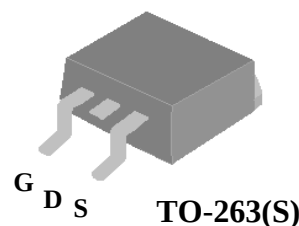


- ▼ 100% R_g & UIS Test
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ Halogen Free & RoHS Compliant Product



BV _{DSS}	-100V
R _{DS(ON)}	24mΩ
I _D	-68A



Description

XP9593 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-263 package is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for high current application due to the low connection resistance.

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

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-100	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Drain Current, V _{GS} @ 10V	-68	A
I _D @T _C =100°C	Drain Current, V _{GS} @ 10V	-43	A
I _{DM}	Pulsed Drain Current ¹	-280	A
P _D @T _C =25°C	Total Power Dissipation	208.3	W
P _D @T _A =25°C	Total Power Dissipation ³	3.12	W
E _{AS}	Single Pulse Avalanche Energy ⁵	125	mJ
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Value	Units
R _{thj-c}	Maximum Thermal Resistance, Junction-case	0.6	°C/W
R _{thj-a}	Maximum Thermal Resistance, Junction-ambient (PCB mount) ³	40	°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	-100	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-30A	-	-	24	mΩ
		V _{GS} =-4.5V, I _D =-20A	-	-	30	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-1	-	-3	V
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-30A	-	80	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-80V, V _{GS} =0V	-	-	-25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} = ±20V, V _{DS} =0V	-	-	±0.1	uA
Q _g	Total Gate Charge ⁴	I _D =-30A	-	191	305	nC
Q _{gs}	Gate-Source Charge ⁴	V _{DS} =-50V	-	37	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge ⁴	V _{GS} =-10V	-	34	-	nC
t _{d(on)}	Turn-on Delay Time ⁴	V _{DS} =-50V	-	20	-	ns
t _r	Rise Time ⁴	I _D =-30A	-	62	-	ns
t _{d(off)}	Turn-off Delay Time ⁴	R _G =3.3Ω	-	175	-	ns
t _f	Fall Time ⁴	V _{GS} =-10V	-	157	-	ns
C _{iss}	Input Capacitance ⁴	V _{GS} =0V	-	10150	16240	pF
C _{oss}	Output Capacitance ⁴	V _{DS} =-80V	-	415	-	pF
C _{rss}	Reverse Transfer Capacitance ⁴	f=1.0MHz	-	95	-	pF
R _g	Gate Resistance	f=1.0MHz	-	3	6	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =-30A, V _{GS} =0V	-	-	-1.3	V
t _{rr}	Reverse Recovery Time ⁴	I _S =-30A, V _{GS} =0V, dI/dt=-100A/μs	-	48	-	ns
Q _{rr}	Reverse Recovery Charge ⁴		-	95	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board
- 4.Guaranteed by design.
- 5.Starting T_j=25°C , V_{DD}=-50V , L=0.1mH , R_G=25Ω , V_{GS}=-10V
- 6.These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_{J(MAX)}=150°C.

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

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT, AUTOMOTIVE 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 DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

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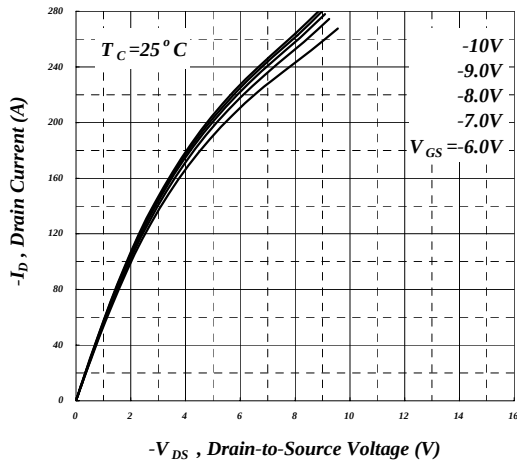


Fig 1. Typical Output Characteristics

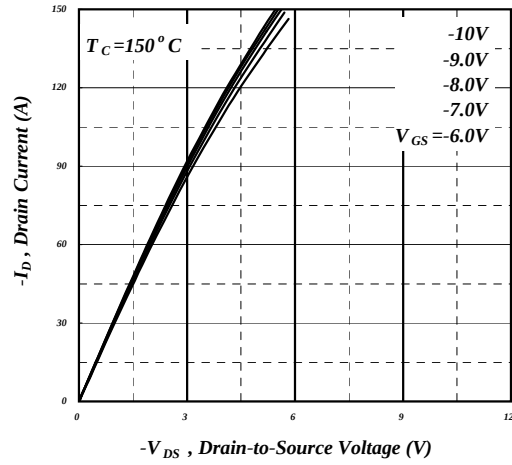


Fig 2. Typical Output Characteristics

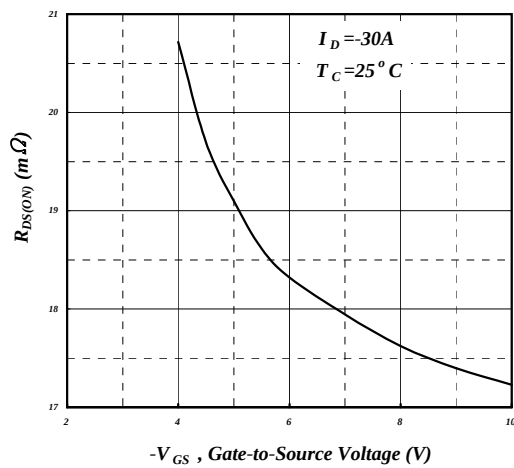
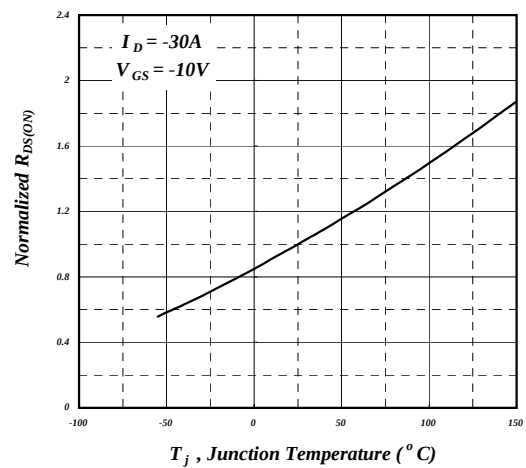
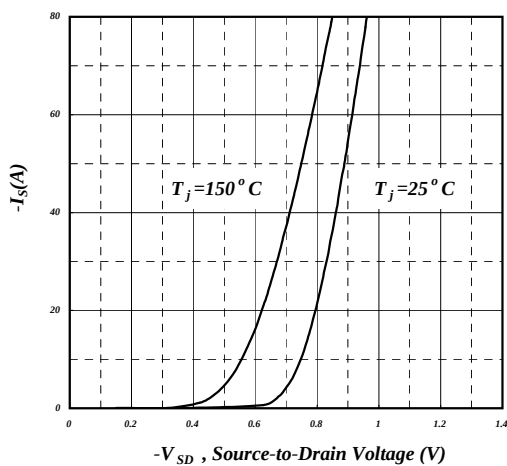


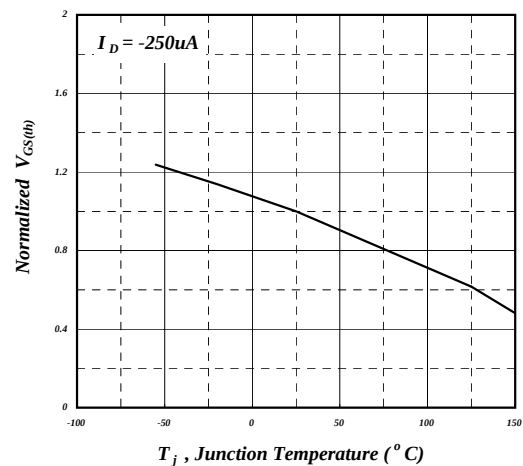
Fig 3. On-Resistance v.s. Gate Voltage



**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**

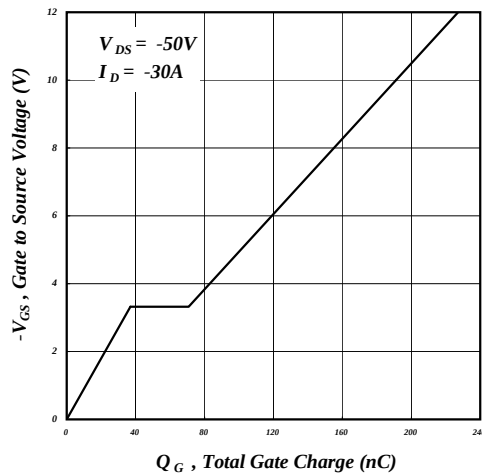


Fig 7. Gate Charge Characteristics

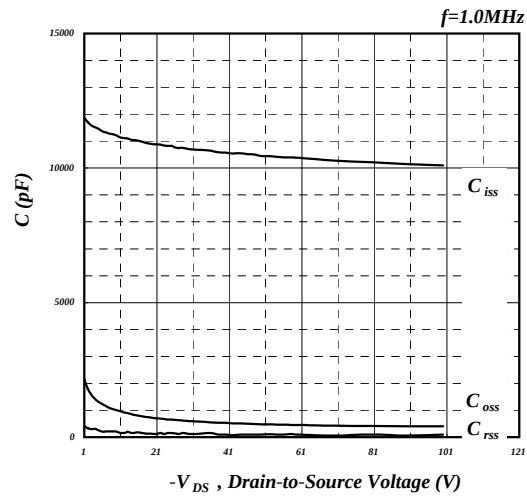


Fig 8. Typical Capacitance Characteristics

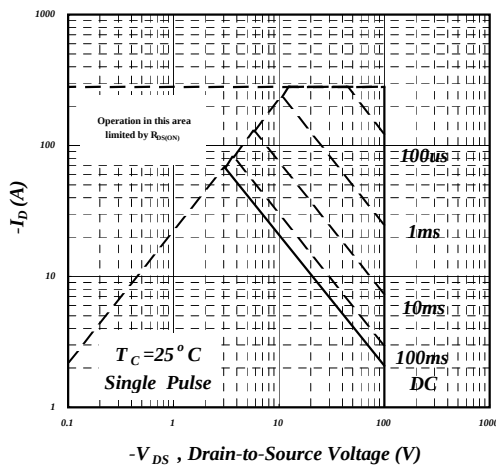


Fig 9. Maximum Safe Operating Area⁶

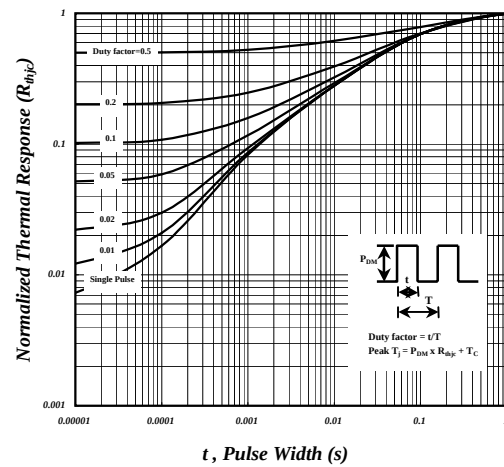


Fig 10. Effective Transient Thermal Impedance

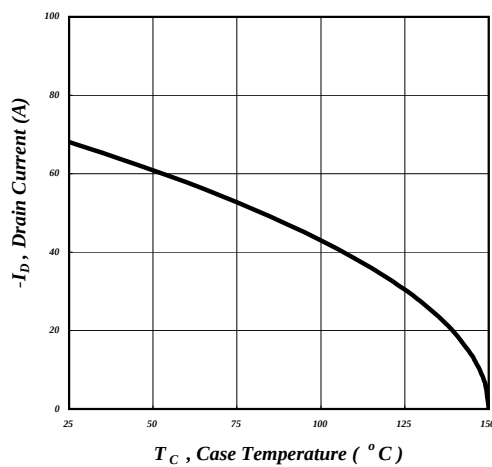


Fig 11. Drain Current v.s. Case Temperature

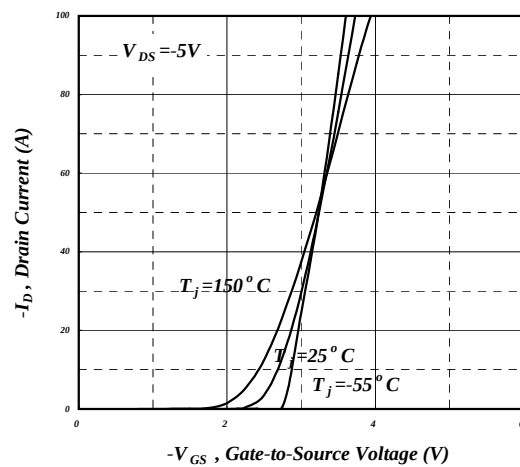
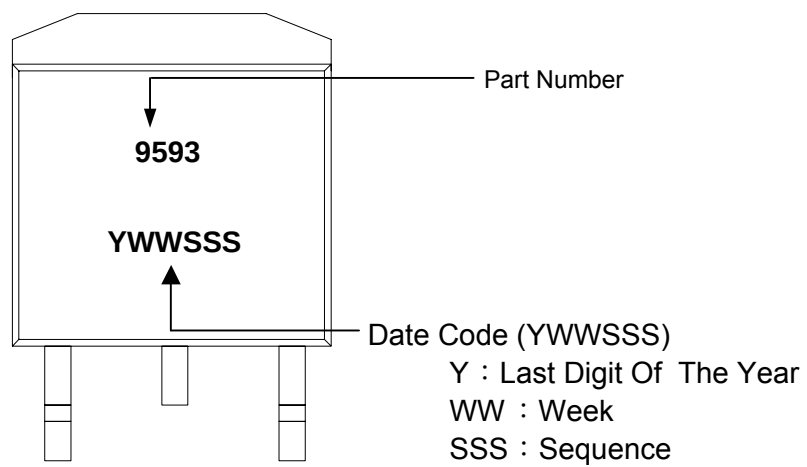
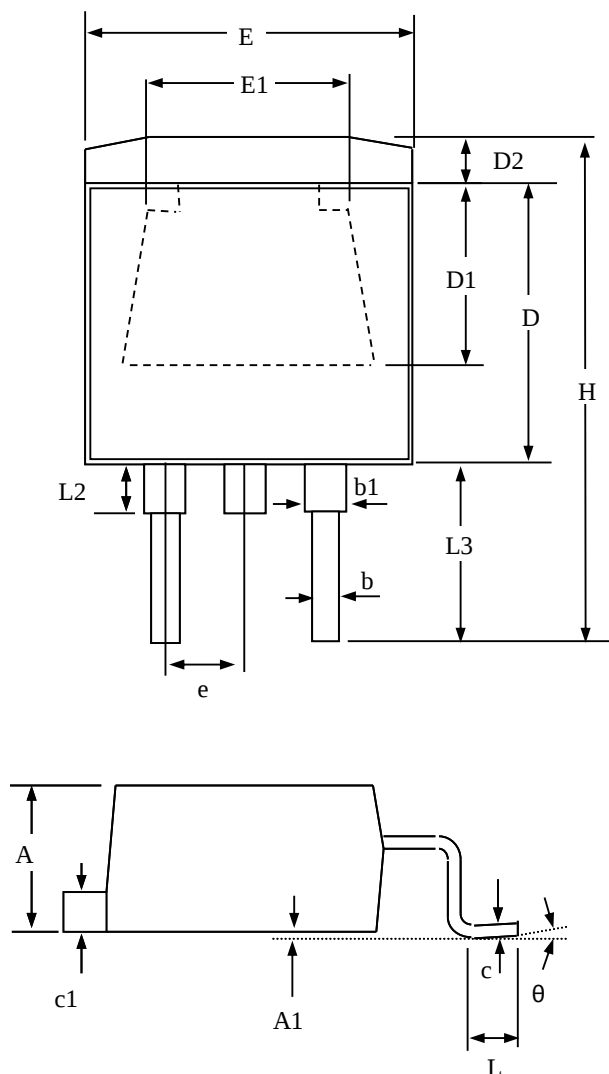


Fig 12. Transfer Characteristics

MARKING INFORMATION

Package Outline : TO-263



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.00	4.75	5.20
A1	0.00	0.15	0.30
b	0.50	0.90	1.10
b1	1.07	1.27	1.47
c	0.30	0.55	0.80
c1	1.10	1.40	1.70
D	8.30	9.05	9.80
D1	5.10(ref)		
D2	1.27(ref)		
E	9.50	10.10	10.70
E1	7.00~9.00(ref)		
e	2.04	2.54	3.04
L1	2.54(ref)		
L2	1.5 (ref)		
L3	3.50	4.50	5.50
θ	0°	-----	8°
H	13.07	15.27	16.57

- 1.All Dimensions Are in Millimeters.
- 2.Dimension Does Not Include Mold Protrusions.

TO-263 FOOTPRINT :