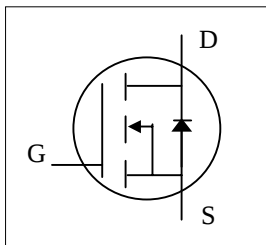


- ▼ 100% R_g & UIS Test
- ▼ Fast Switching Characteristic
- ▼ Simple Drive Requirement
- ▼ RoHS Compliant & Halogen-Free

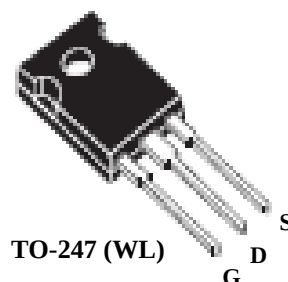


BV_{DSS}	650V
$R_{DS(ON)}$	99m Ω
I_D^3	38A

Description

XP65SL099D 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-247 package is widely preferred for commercial-industrial applications. The device is suited for switch mode power supplies, DC-AC converters and high current high speed switching circuits.



Absolute Maximum Ratings@ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	+20	V
V_{GS}	Gate-Source Voltage, AC ($f > 1\text{Hz}$)	+30	V
$I_D@T_C=25^\circ\text{C}$	Drain Current, $V_{GS} @ 10V^3$	38	A
$I_D@T_C=100^\circ\text{C}$	Drain Current, $V_{GS} @ 10V^3$	23.5	A
I_{DM}	Pulsed Drain Current ¹	94	A
dv/dt	MOSFET dv/dt Ruggedness ($V_{DS} = 0 \dots 480V$)	20	V/ns
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	277.8	W
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	3.12	W
E_{AS}	Single Pulse Avalanche Energy ⁴	768	mJ
dv/dt	Peak Diode Recovery dv/dt ⁵	10	V/ns
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	0.45	$^\circ\text{C}/\text{W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	40	$^\circ\text{C}/\text{W}$

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	650	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =12.8A	-	-	99	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	5	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =12.8A	-	22	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =520V, V _{GS} =0V	-	-	100	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =+20V, V _{DS} =0V	-	-	+1	uA
Q _g	Total Gate Charge	I _D =12.8A	-	113	181	nC
Q _{gs}	Gate-Source Charge	V _{DS} =480V	-	24	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	48	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =300V	-	24	-	ns
t _r	Rise Time	I _D =12.8A	-	39	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω	-	115	-	ns
t _f	Fall Time	V _{GS} =10V	-	35	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	4200	6720	pF
C _{oss}	Output Capacitance	V _{DS} =100V	-	120	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	25	-	pF
R _g	Gate Resistance	f=1.0MHz	-	4.4	8.8	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =12.8A, V _{GS} =0V	-	0.85	-	V
t _{rr}	Reverse Recovery Time	I _S =19.2A, V _{GS} =0V	-	185	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	1.8	-	μC

Notes:

- 1.Pulse width limited by max. junction temperature.
- 2.Pulse test
- 3.Limited by max. junction temperature. Maximum duty cycle D=0.75
- 4.Starting T_j=25°C, V_{DD}=50V, L=150mH, R_G=25Ω
- 5.I_{SD} ≤ I_D, V_{DD} ≤ BV_{DSS}, starting T_J = 25°C

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.

YAGEO 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.

YAGEO XSEMI RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

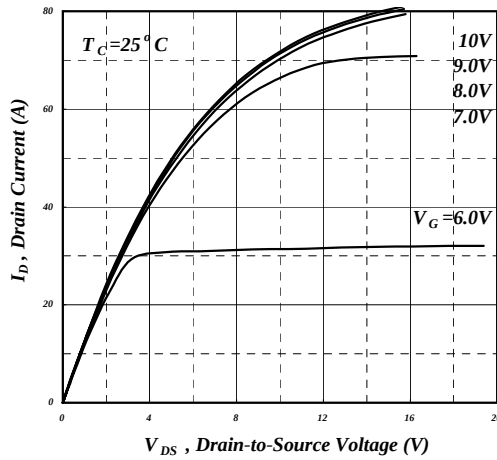


Fig 1. Typical Output Characteristics

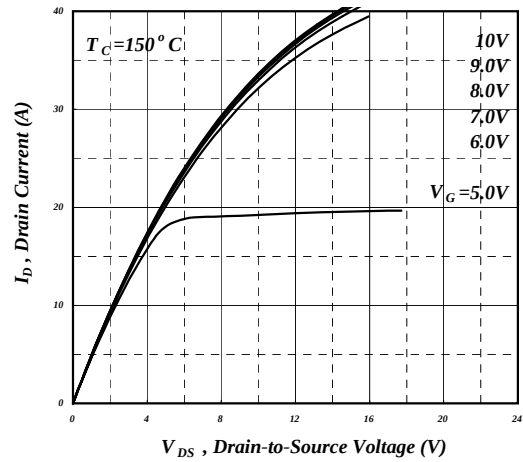


Fig 2. Typical Output Characteristics

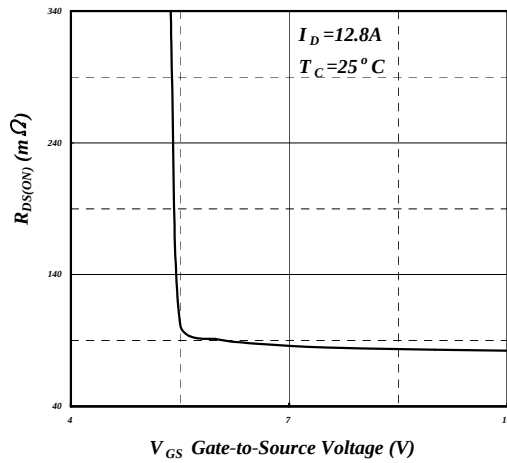


Fig 3. On-Resistance v.s. Gate Voltage

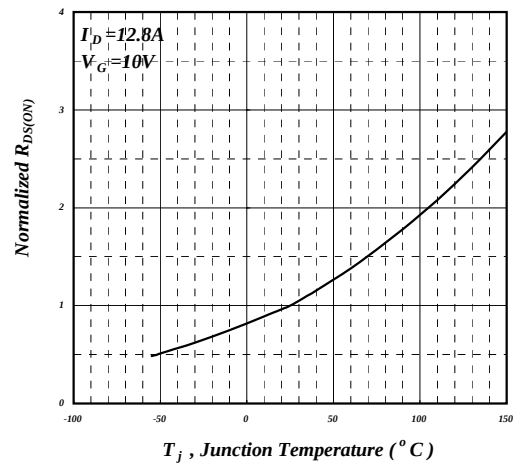


Fig 4. Normalized On-Resistance v.s. Junction Temperature

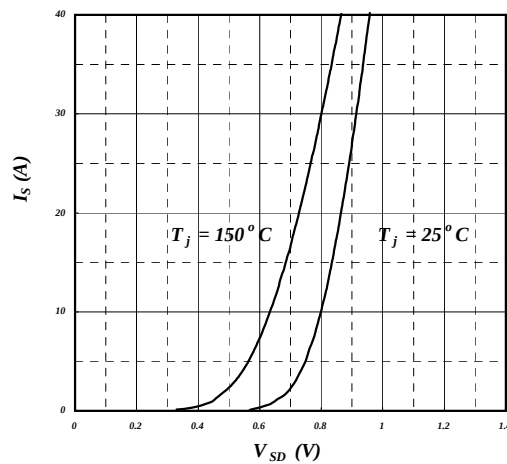


Fig 5. Forward Characteristic of Reverse Diode

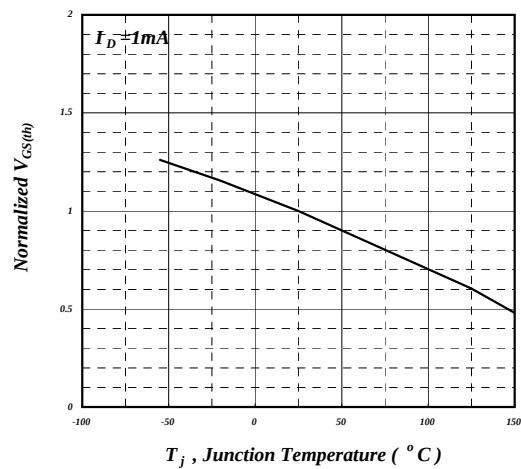


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

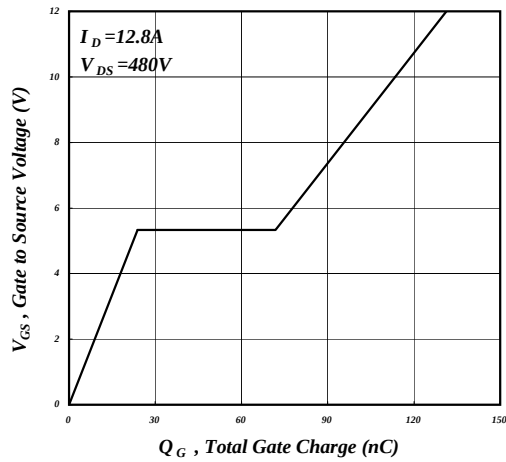


Fig 7. Gate Charge Characteristics

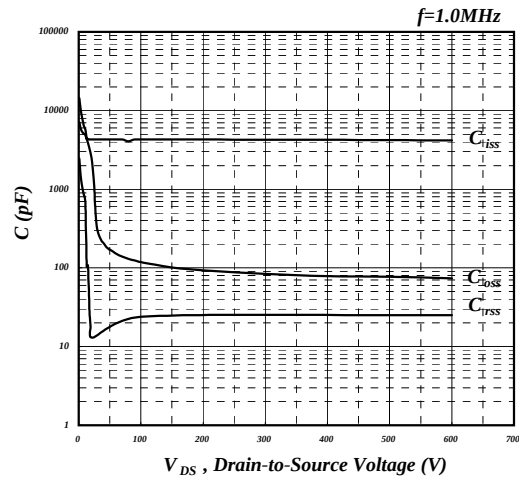


Fig 8. Typical Capacitance Characteristics

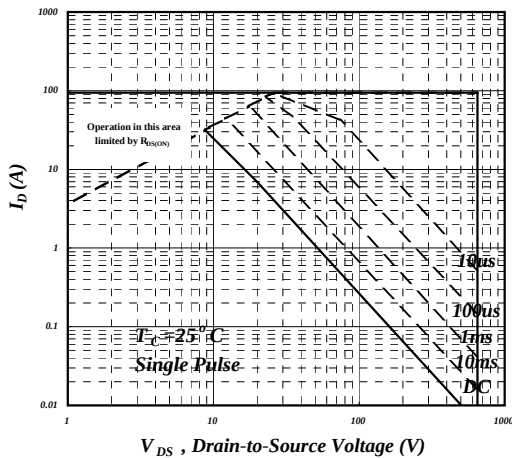


Fig 9. Maximum Safe Operating Area

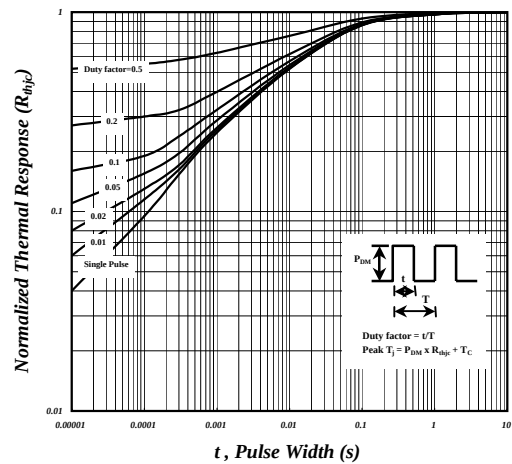


Fig10. Effective Transient Thermal Impedance

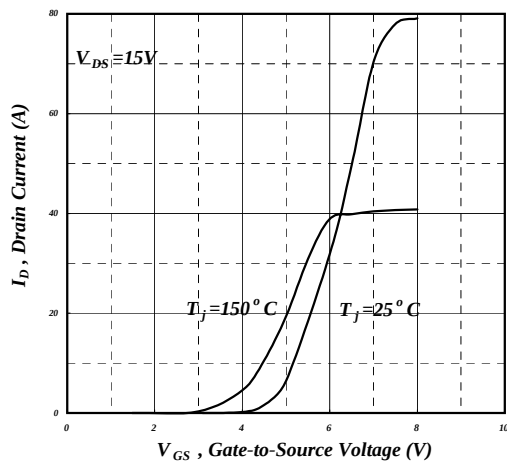


Fig 11. Transfer Characteristics

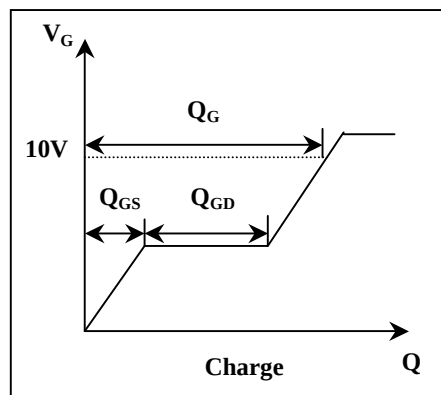


Fig 12. Gate Charge Waveform

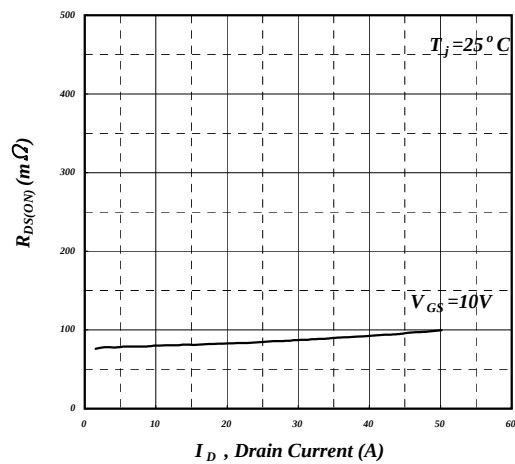


Fig 13. Typ. Drain-Source on State Resistance

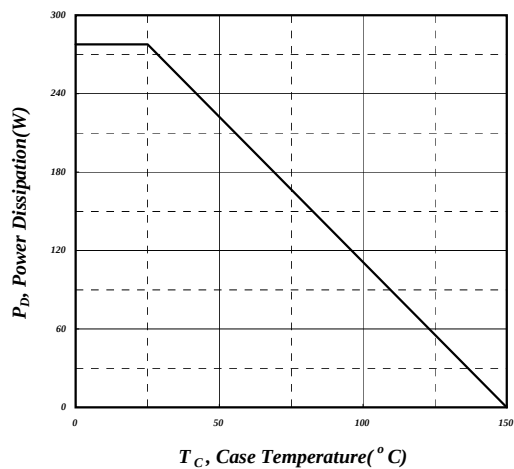
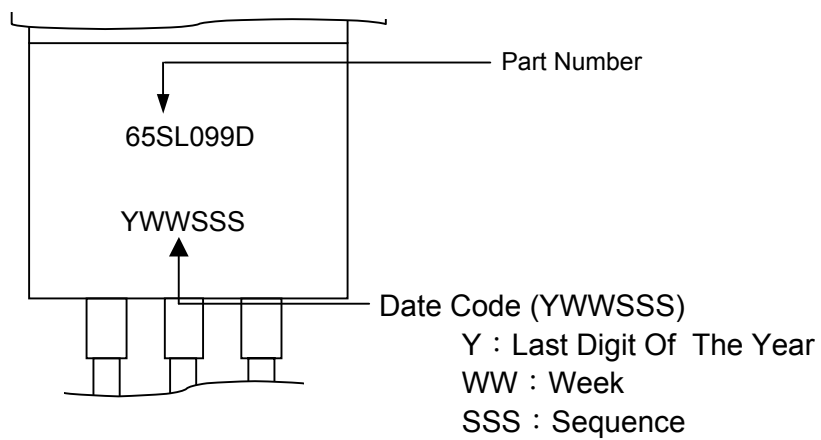
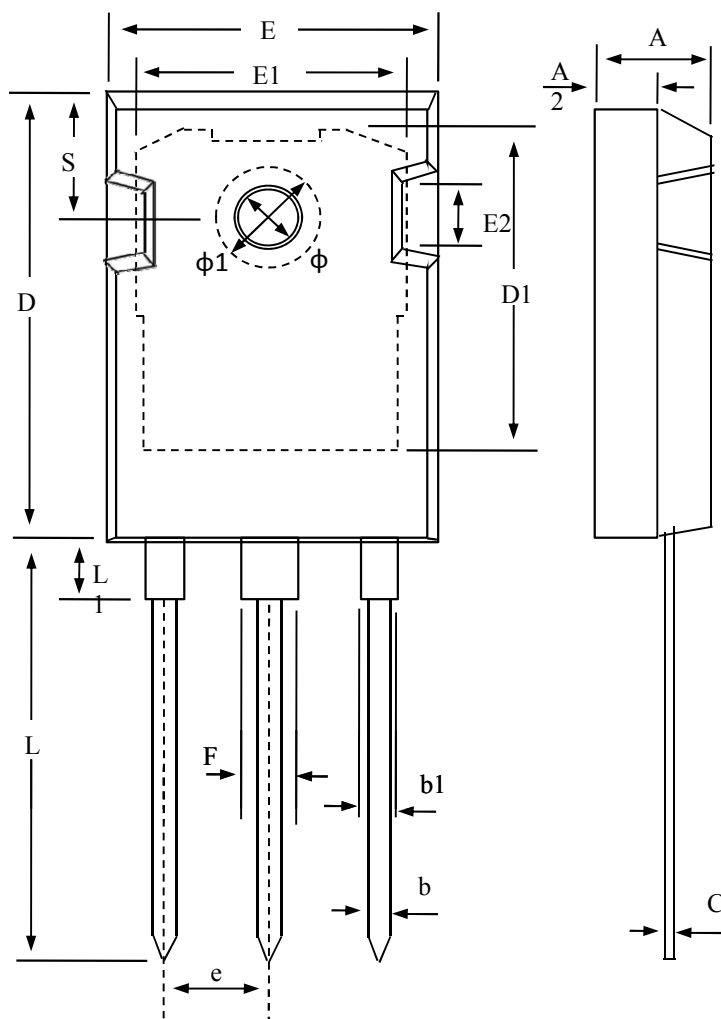


Fig 14. Total Power Dissipation

MARKING INFORMATION



Package Outline : TO-247



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.80	5.03	5.25
A2	1.90	2.05	2.20
E	15.75	15.95	16.15
E1	13.00	13.60	14.20
E2	3.60	4.35	5.10
D	20.80	20.95	21.10
D1	16.20	16.95	17.70
C	0.50	0.60	0.70
L	19.80	20.10	20.40
L1	4.10	4.25	4.40
F	2.80	3.10	3.40
b	1.05	1.20	1.35
b1	1.90	2.18	2.45
e	5.44 ref.		
ϕ	3.50	3.58	3.65
$\phi1$	7.18 ref.		
S	6.00	6.15	6.30

1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.

TO-247 FOOTPRINT :

