

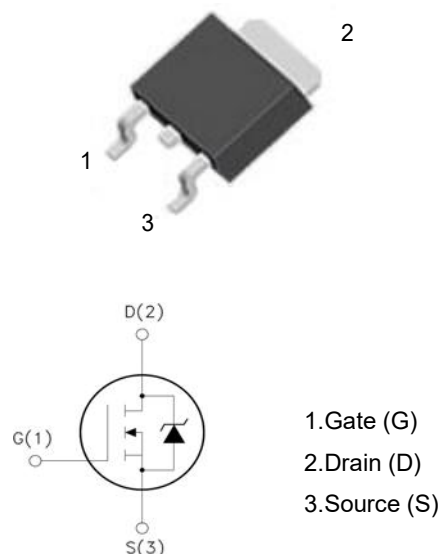
## XXW85P03

30V P-Channel MOSFET

### Features:

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge : $Q_g=88\text{nC}$  (Typ.).
- $V_{DSS}=-30\text{V}, I_D=-85\text{A}$
- $R_{DS(on)} : 4.3\text{m}\Omega$  (Typ.) @ $V_G=10\text{V}$
- 100% Avalanche Tested

TO-252



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DSS}$	Drain-Source Voltage	-30	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current (Chip), $V_{GS} @ 10\text{V}$	-85	A
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current <sup>3</sup> , $V_{GS} @ 10\text{V}$	-53	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current <sup>3</sup> , $V_{GS} @ 10\text{V}$	-21.2	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	-112	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	48	W
$P_D@T_A=100^\circ\text{C}$	Total Power Dissipation	5	W
$T_{STG}$	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	Unit
$R_{thj-c}$	Maximum Thermal Resistance, Junction-case	1.05	$^\circ\text{C}/\text{W}$
$R_{thj-a}$	Maximum Thermal Resistance, Junction-ambient <sup>3</sup>	62.5	$^\circ\text{C}/\text{W}$

**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	-30	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A	-	4.3	5.0	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-15A	-	5.7	7.5	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1	-1.45	-3	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-20A	-	66	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V	-	-	-10	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =-10A	-	94	130	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-15V	-	18	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =-4.5V	-	25	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =-15V	-	22	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =-1A	-	48	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω	-	197	-	ns
t <sub>f</sub>	Fall Time	V <sub>GS</sub> =-10V	-	90	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	6060	-	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =-15V	-	709	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	361	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	2.7	5.4	Ω

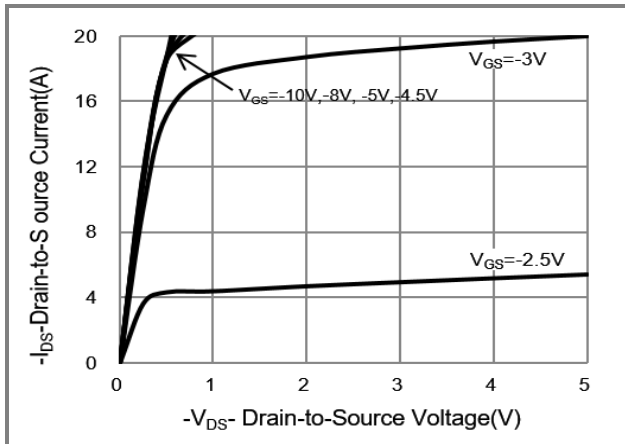
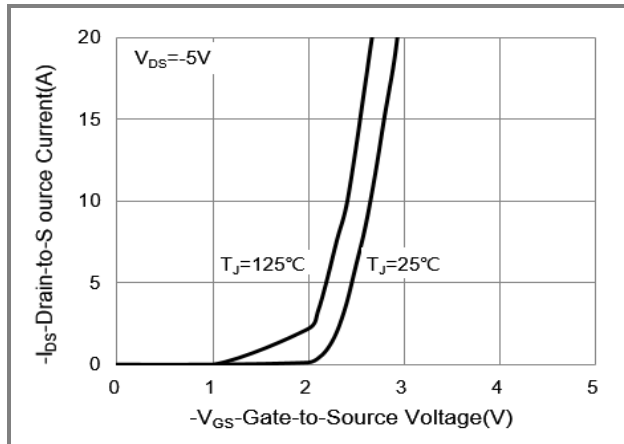
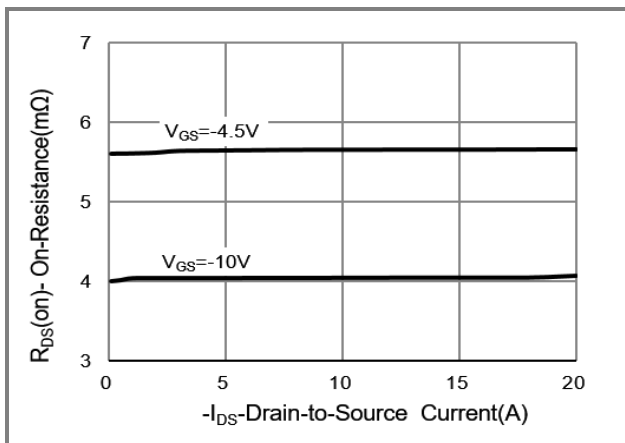
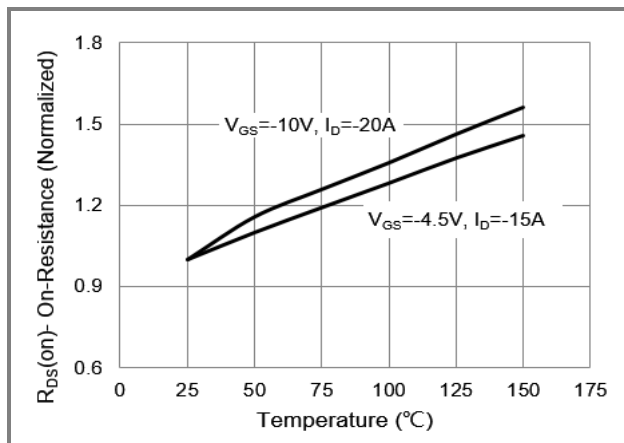
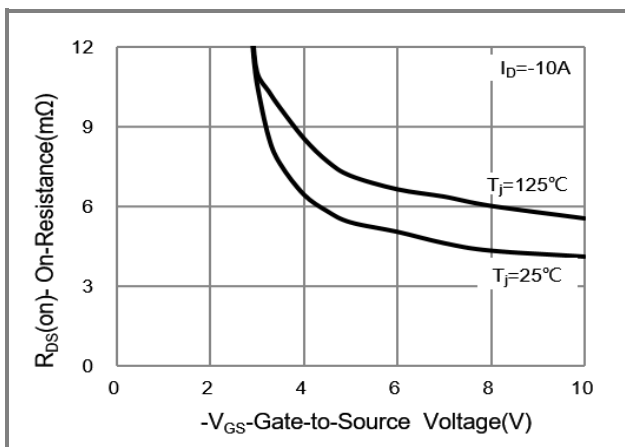
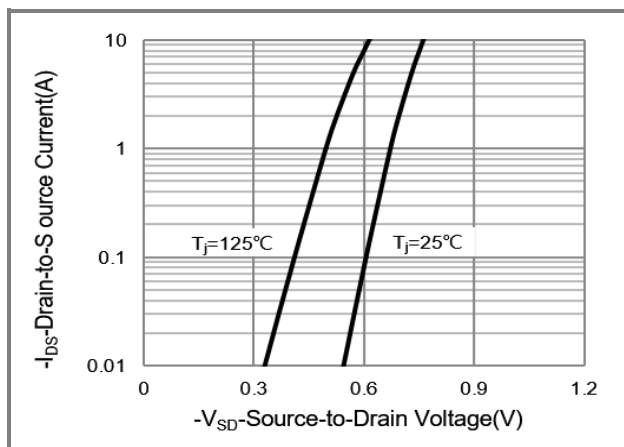
**Source-Drain Diode**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =-10A, V <sub>GS</sub> =0V	-	-	-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =-10A, V <sub>GS</sub> =0V,	-	45	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI/dt=100A/μs	-	45	-	nC

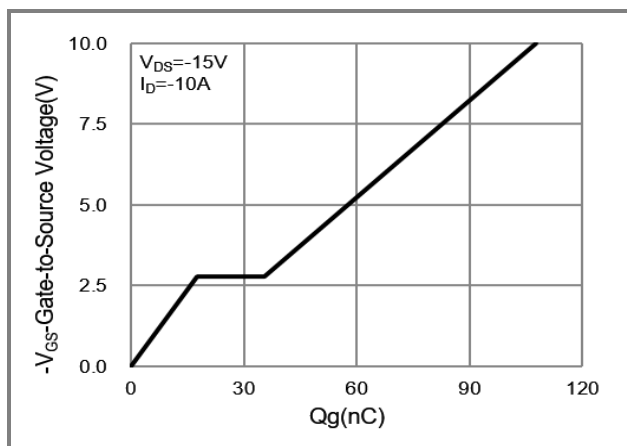
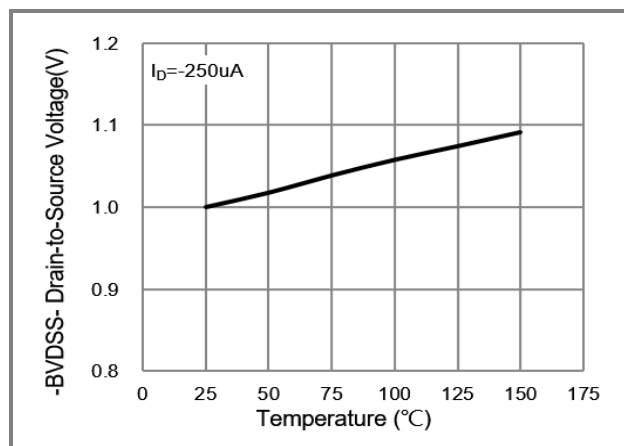
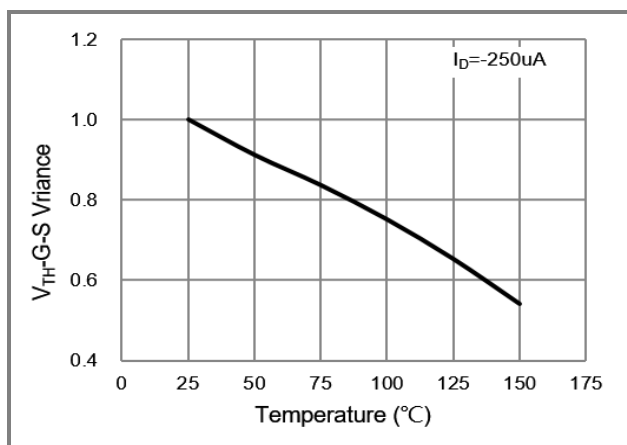
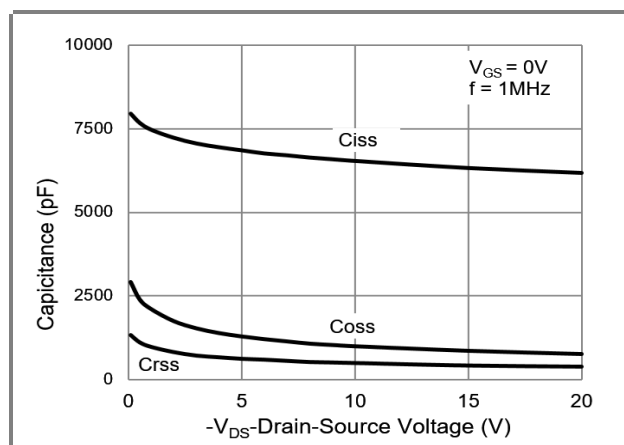
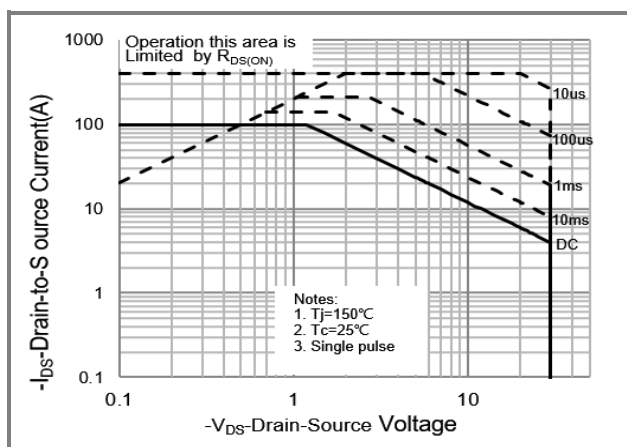
**Notes:**

1. Pulse width limited by Max. junction temperature.
2. Pulse test
3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board, t ≤ 10sec ; 60°C/W at steady state.

## Typical Characteristics

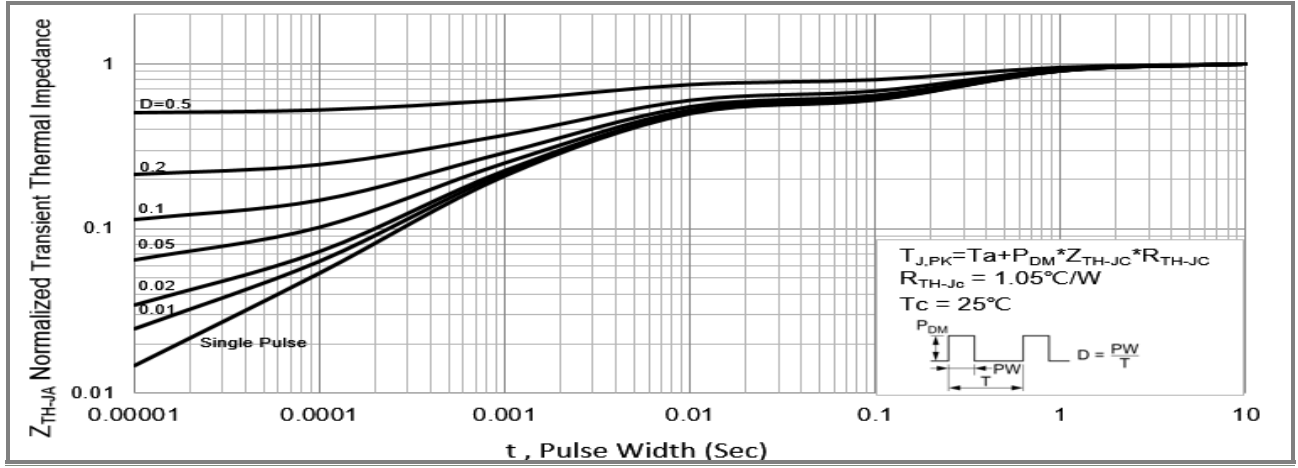
**Fig.1 Output Characteristics**

**Fig.2 Transfer Characteristics**

**Fig.3 On-Resistance vs. Drain Current**

**Fig.4 On-Resistance vs. Junction Temperature**

**Fig.5 On-Resistance Variation with V\_GS.**

**Fig.6 Body Diode Characteristics**


## Typical Characteristics

**Fig.7 Gate Charge**

**Fig.8 Breakdown Voltage Variation vs. Temperature**

**Fig.9 Threshold Voltage Variation with Temperature**

**Fig.10 Capacitance vs. Drain Source Voltage**

**Fig.11 Maximum Safe Operating Area**


Typical Characteristics

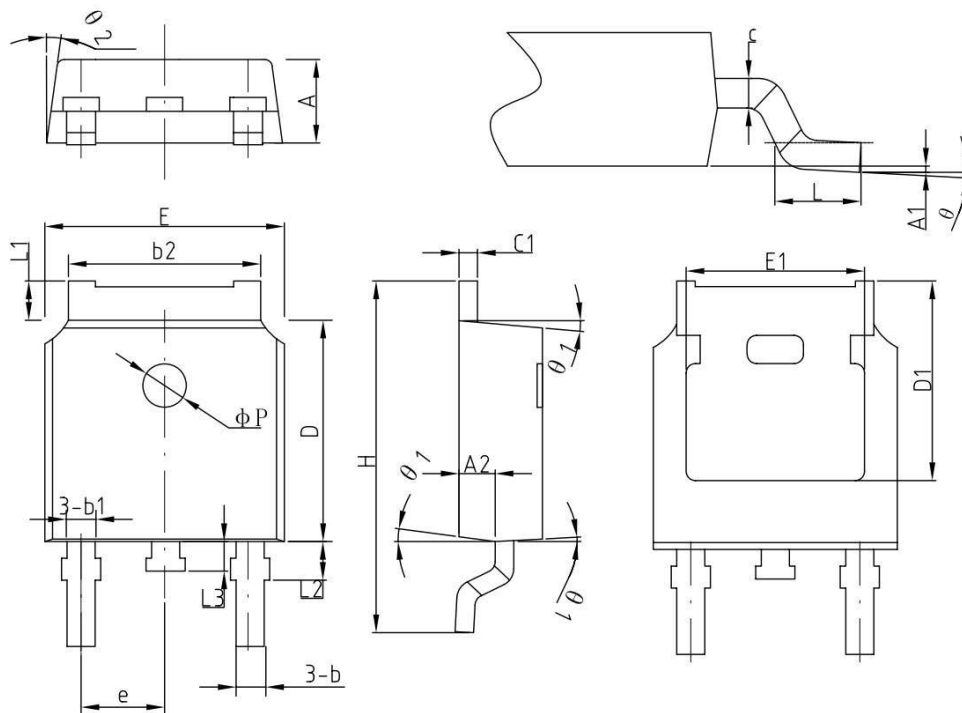
Fig.12 Normalized Transient Thermal Impedance vs. Pulse Width



## Package Dimension

### TO-252

Units: mm



COMMON DIMENSIONS  
 (UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	2.2	2.30	2.38
A1	0	—	0.10
A2	0.90	1.01	1.10
b	0.71	0.76	0.86
b1		0.76	
b2	5.13	5.33	5.46
c	0.47	0.50	0.60
c1	0.47	0.50	0.60
D	6.0	6.10	6.20
D1	—	5.30	—
E	6.50	6.60	6.70
E1	—	4.80	—
e	2.286BSC		
H	9.70	10.10	10.40
L	1.40	1.50	1.70
L1	0.90	—	1.25
L2		1.05	
L3		0.8	
φP		1.2	
θ	0°	—	8°
θ 1	5°	7°	9°
θ 2	5°	7°	9°