

General Description

The XXW15P04 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as -4.5V. This device is suitable for use as a wide variety of applications.

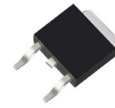
Features

$V_{DS} = -40V, I_D = -15A$
 $R_{DS(ON)} < 36m\Omega @ V_{GS} = -10V$
 $R_{DS(ON)} < 52m\Omega @ V_{GS} = -4.5V$

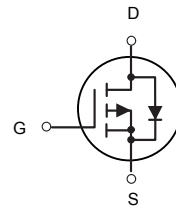
High Power and current handing capability
 Lead free product is acquired
 Surface Mount Package

Application

PWM applications
 Load switch
 Power management



TO252-2L



P-Channel MOSFET

Absolute Maximum Ratings ($T_A=25^\circ C$)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	-40	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	V
I_D	Drain Current-Continuous($T_c=25^\circ C$)	-15	A
	Drain Current-Continuous($T_c=100^\circ C$)	-10	A
$I_{DM (pluse)}$	(Note 1) Drain Current-Continuous@ Current-Pulsed	-80	A
P_D	Maximum Power Dissipation($T_c=25^\circ C$)	37.5	W
	Maximum Power Dissipation($T_c=100^\circ C$)	19	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	$^\circ C$

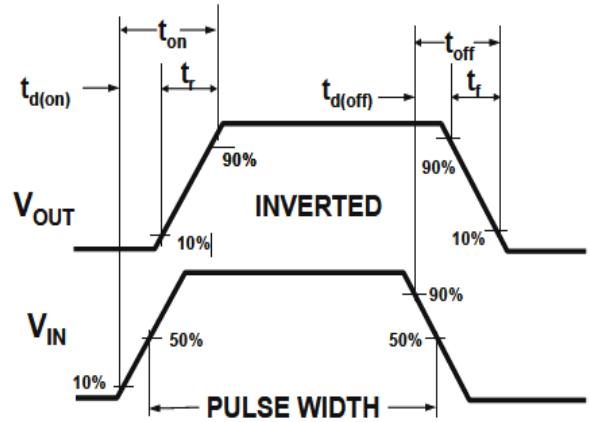
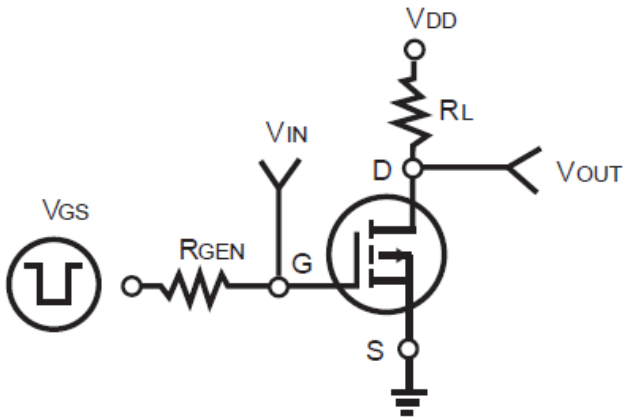
R_{JC}	Thermal Resistance, Junction-to-Case	4	$^{\circ}\text{C}/\text{W}$
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Electrical Characteristics (TA=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-40			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-32V, V_{GS}=0V$			-1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-2	-3	V
g_{FS}	Forward Transconductance	$V_{DS}=-5V, I_D=-10A$		25		S
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=-10V, I_D=-20A$		25	36	m Ω
		$V_{GS}=-4.5V, I_D=-10A$		42	52	m Ω
C_{iss}	Input Capacitance	$V_{DS}=-25V, V_{GS}=0V,$ $f=1.0\text{MHz}$		840		pF
C_{oss}	Output Capacitance			92		pF
C_{riss}	Reverse Transfer Capacitance			60		pF
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=-10V, V_{DS}=-20V,$ $R_L=1.6, R_{GEN}=3$		5		nS
t_r	Turn-on Rise Time			12		nS
$t_{d(off)}$	Turn-Off Delay Time			20		nS
t_f	Turn-Off Fall Time			4.5		nS
Q_g	Total Gate Charge	$V_{GS}=-10V, V_{DS}=-20V, I_D=-15A$		20		nC
Q_{gs}	Gate-Source Charge			2.5		nC
Q_{gd}	Gate-Drain Charge			4.5		nC
I_{SD}	Source-Drain Current (Body Diode)				-20	A
V_{SD}	Forward on Voltage	$V_{GS}=0V, I_S=-20A$			-1.2	V

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature

Switch Time Test Circuit and Switching Waveforms:



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Power Dissipation

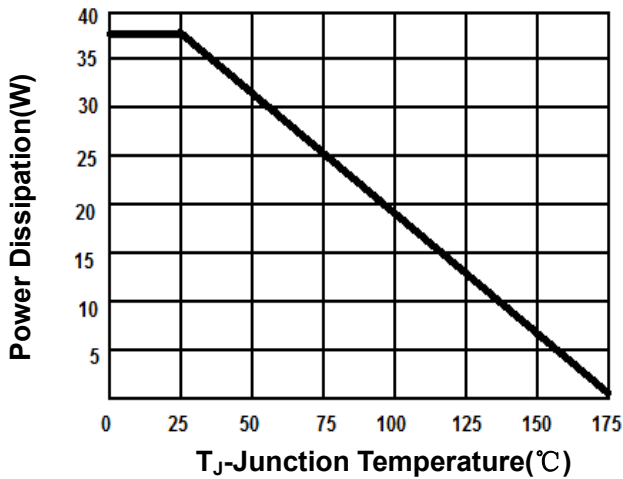


Figure2. Drain Current

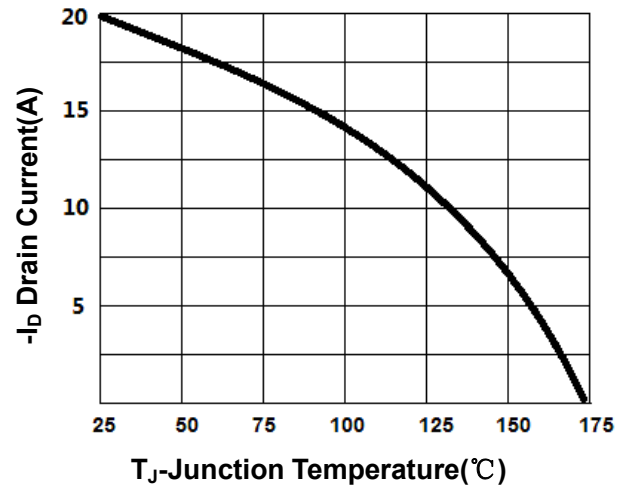


Figure3. Output Characteristics

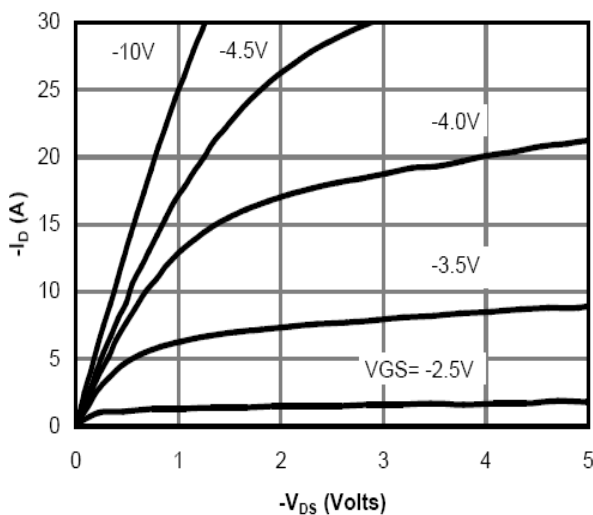


Figure4. Transfer Characteristics

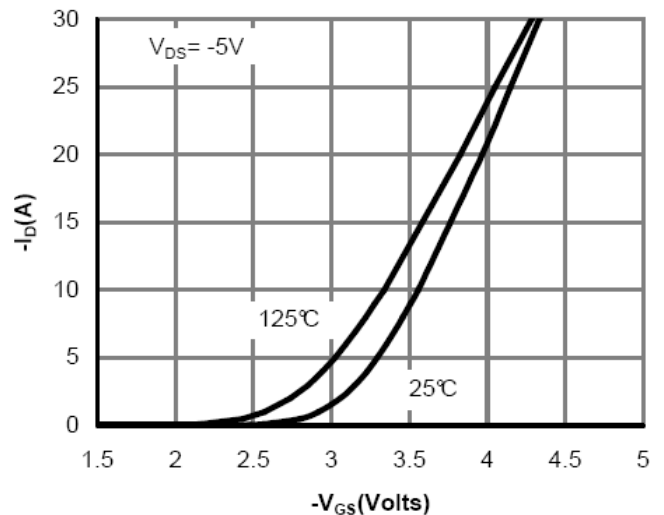
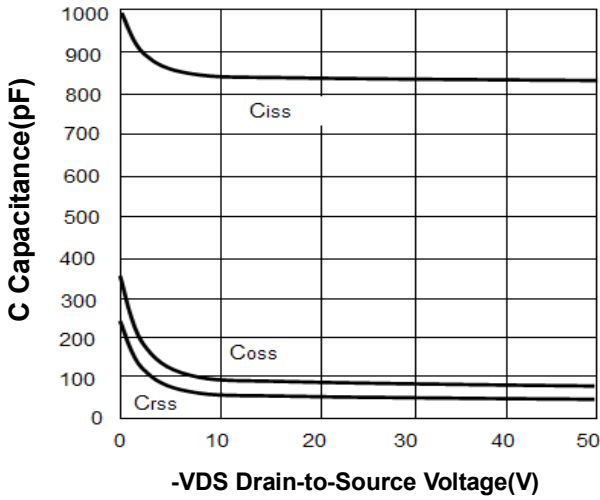
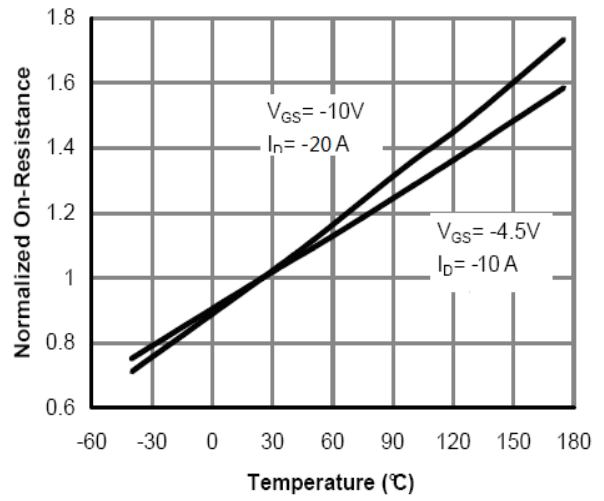
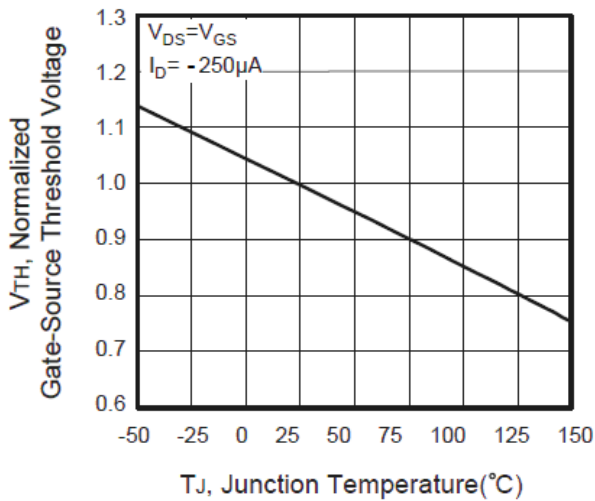
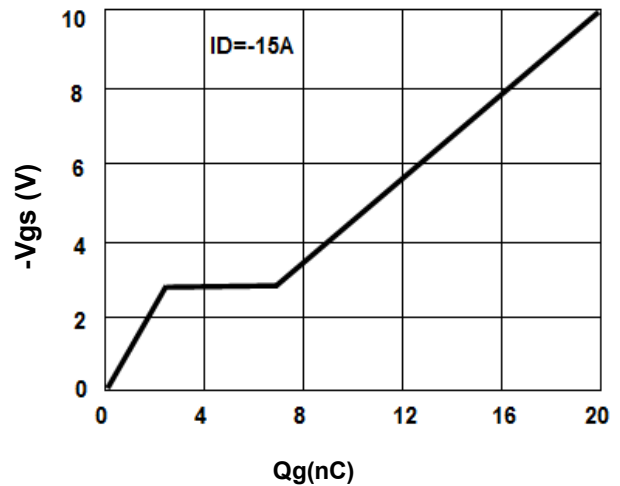
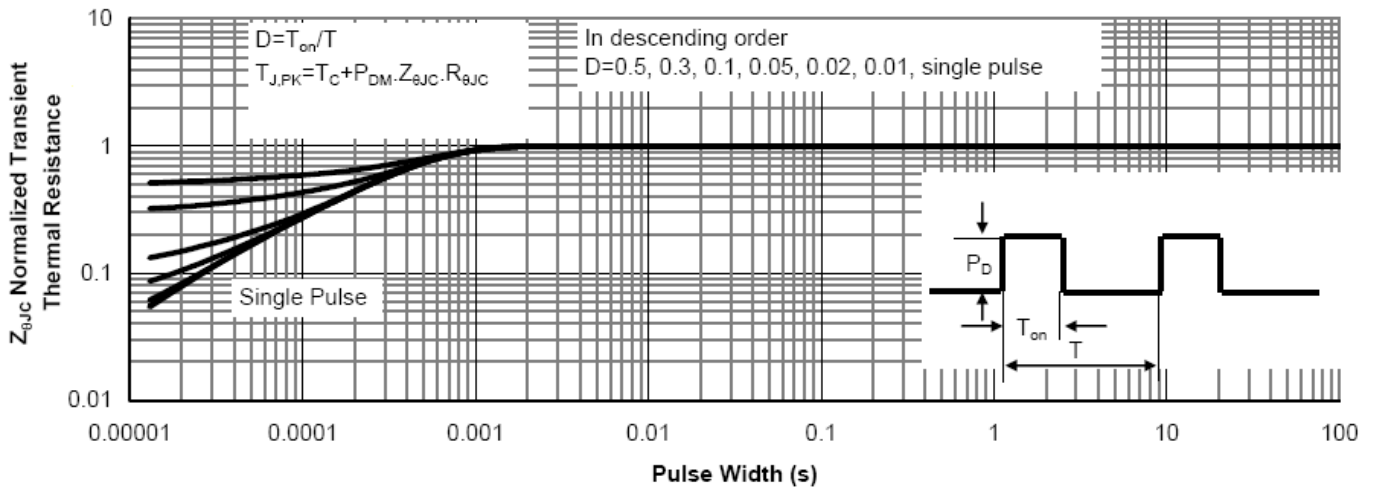
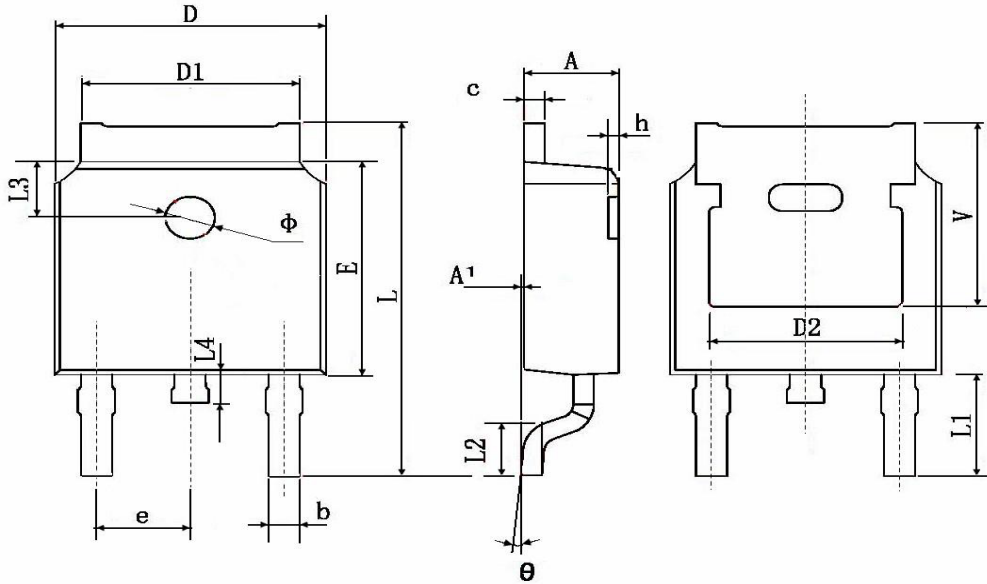


Figure5. Capacitance

Figure6. $R_{DS(ON)}$ vs Junction Temperature

Figure7. $V_{GS(th)}$ vs Junction Temperature

Figure8. Gate Charge Waveforms

Figure9. Normalized Maximum Transient Thermal Impedance


TO252-2L Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	