

- ★ Super Low Gate Charge
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Description

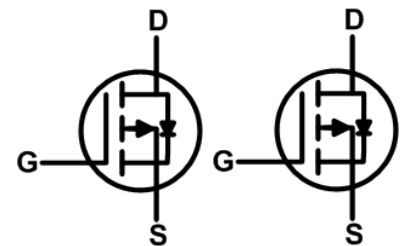
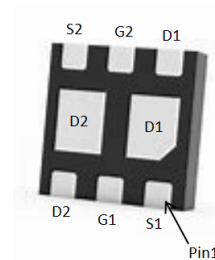
The XXW3P02M is the high cell density trenched P-ch MOSFETs, which provide excellent R_{DS(on)} and gate charge for most of the synchronous buck converter applications.

The XXW3P02M meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

Product Summary

BVDSS	R _{DS(on)}	ID
-20V	95mΩ	-3A

DFN2020-6L Pin Configurations



Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-20	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _A =25°C	Continuous Drain Current, V _{GS} @ -4.5V ¹	-3	A
I _D @T _A =70°C	Continuous Drain Current, V _{GS} @ -4.5V ¹	-1.4	A
I _{DM}	Pulsed Drain Current ²	-6	A
P _D @T _A =25°C	Total Power Dissipation ³	0.8	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-ambient ¹	---	156	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	---	°C/W

P-Channel Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D = -250\mu A$	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -20V, V_{GS} = 0V,$	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 12V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.7	-1.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note2</small>	$V_{GS} = -4.5V, I_D = -2A$	-	95	125	m Ω
		$V_{GS} = -2.5V, I_D = -1A$	-	135	190	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = -10V, V_{GS} = 0V,$ $f = 1.0MHz$	-	185	-	pF
C_{oss}	Output Capacitance		-	35	-	pF
C_{rss}	Reverse Transfer Capacitance		-	25	-	pF
Q_g	Total Gate Charge	$V_{DS} = -10V, I_D = -2A,$ $V_{GS} = -4.5V$	-	2.2	-	nC
Q_{gs}	Gate-Source Charge		-	0.5	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	0.5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -10V, R_L=5\Omega,$ $R_{GEN}=3\Omega, V_{GS}=-4.5V,$	-	10	-	ns
t_r	Turn-on Rise Time		-	30	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	63	-	ns
t_f	Turn-off Fall Time		-	50	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-2	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-8	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_S = -2A$	-	-	-1.2	V

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

 2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

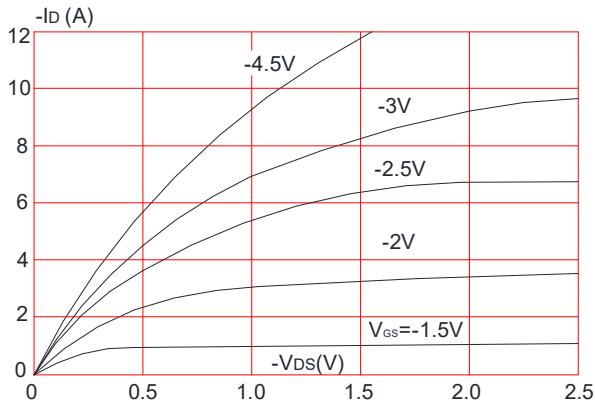


Figure 2: Typical Transfer Characteristics

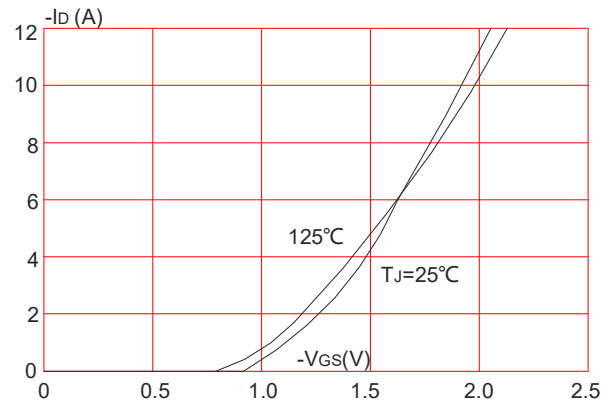


Figure 3: On-resistance vs. Drain Current

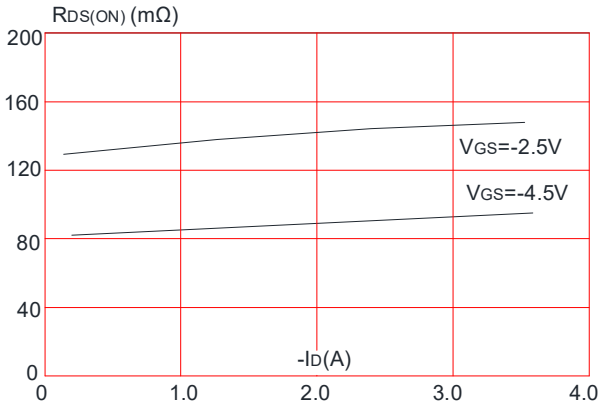


Figure 4: Body Diode Characteristics

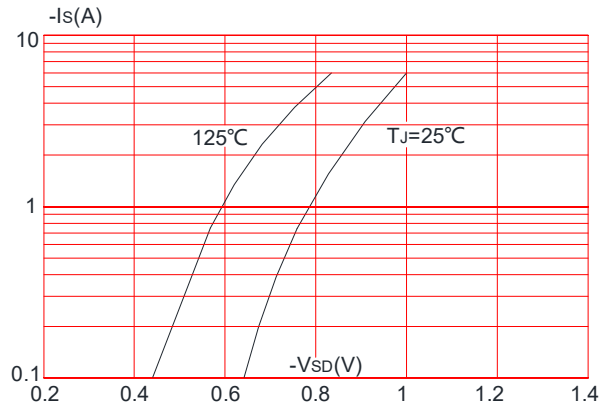


Figure 5: Gate Charge Characteristics

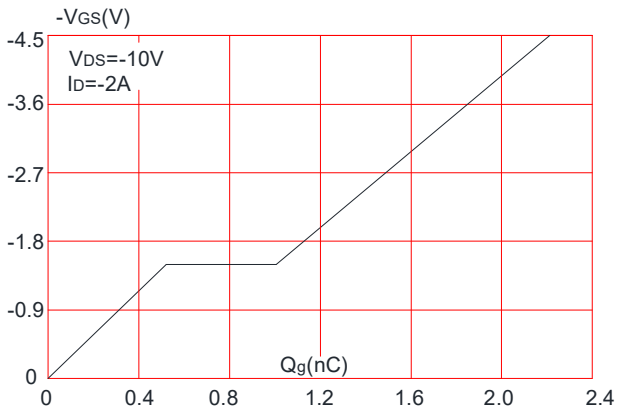
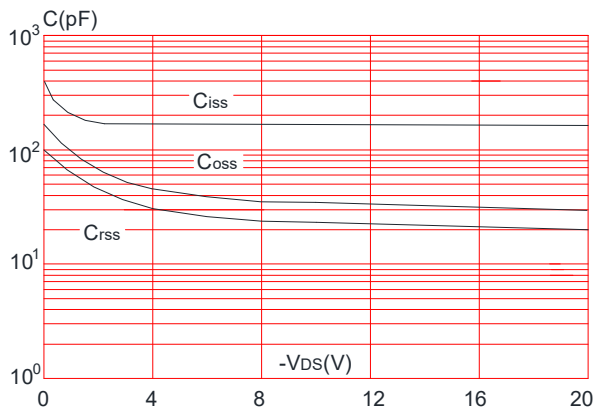
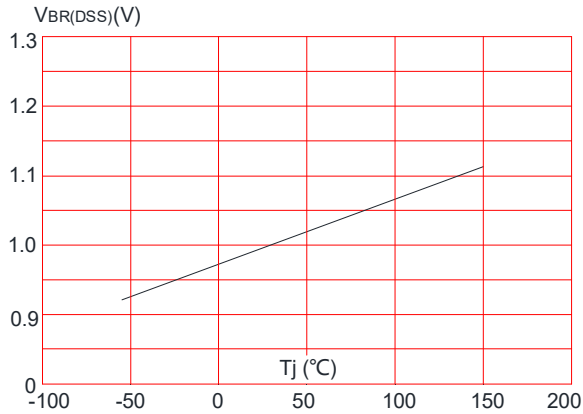
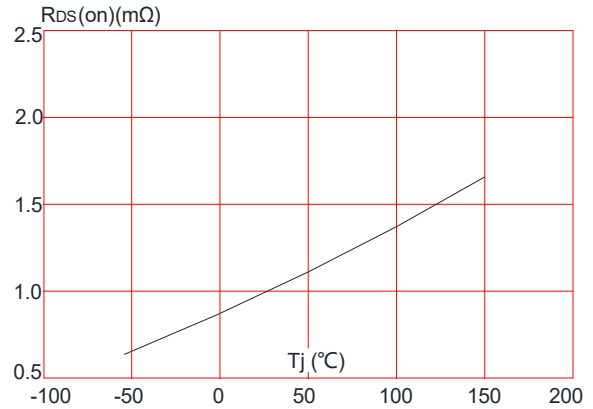
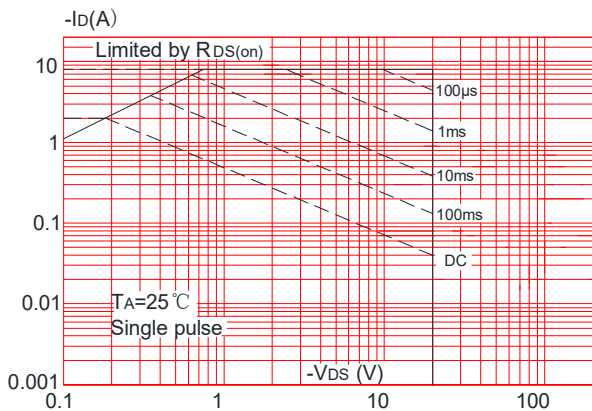
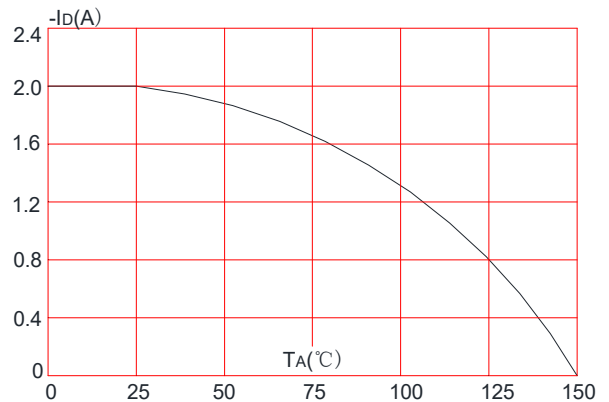
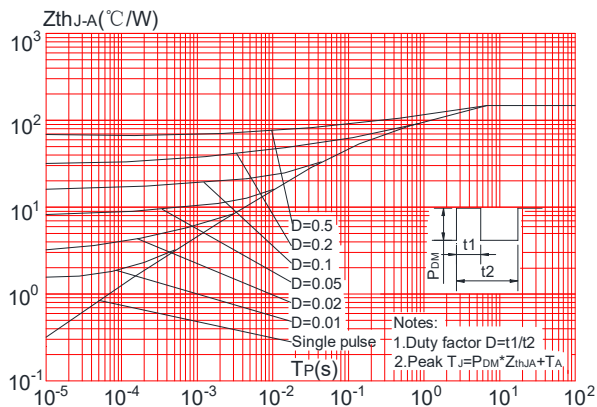
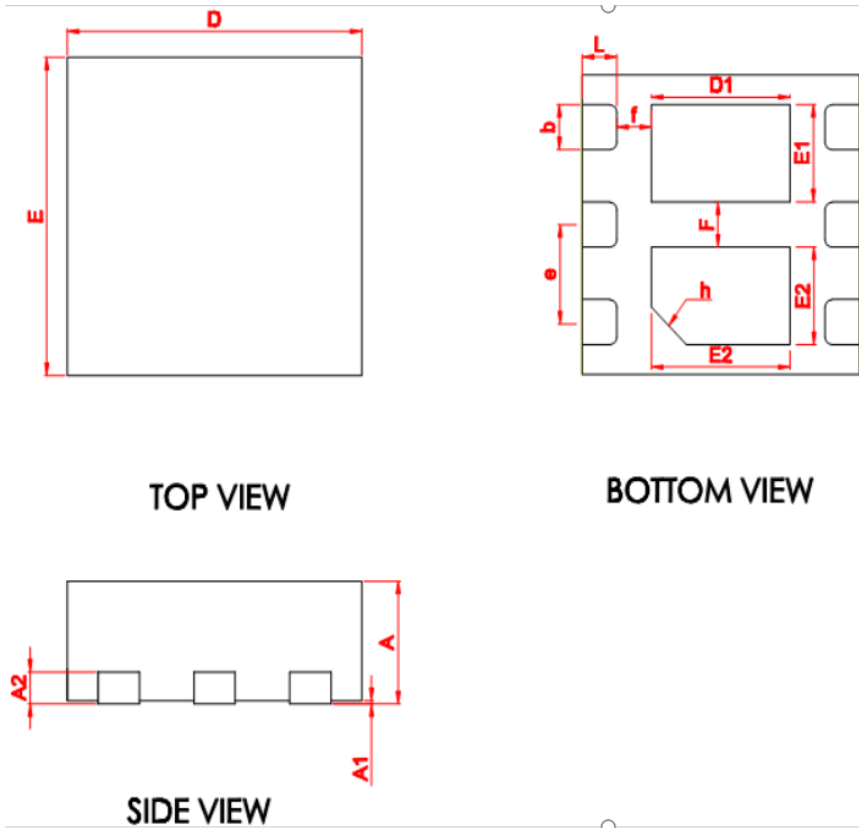


Figure 6: Capacitance Characteristics



Dual P-Ch 20V Fast Switching MOSFETs
Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

Figure 8: Normalized on Resistance vs. Junction Temperature

Figure 9: Maximum Safe Operating Area

Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient


DFN2020-6L Package Information


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.700	0.750	0.800
* A1	0.000	0.020	0.050
* b	0.275	0.300	0.325
* A2	0.190	0.210	0.230
* D	1.900	2.000	2.100
* E	1.900	2.000	2.100
* E1	0.570	0.620	0.670
* E2	0.570	0.620	0.670
* D1	0.950	1.000	1.050
* D2	0.950	1.000	1.050
* e	0.600	0.650	0.700
h	0.300	0.350	0.400
* L	0.200	0.250	0.300
* F	0.250	0.300	0.350
* f	0.200	0.250	0.300