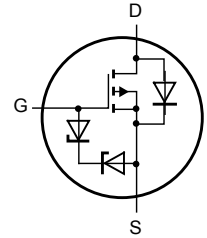
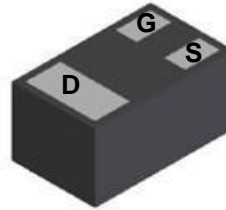
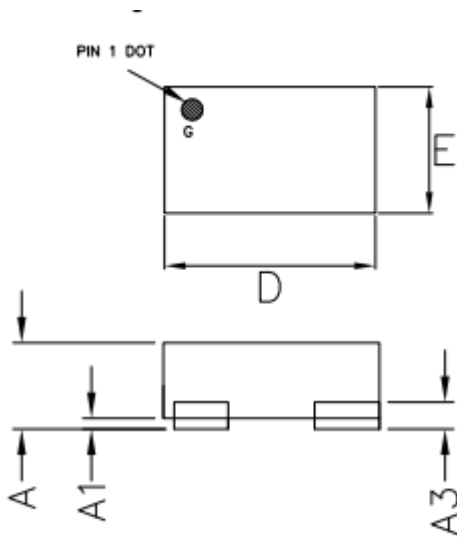


P-Channel Enhancement Mode Power MOSFET
● Features

$V_{DS} = -20V$
 $I_D = -0.5A$
 $R_{DS(ON)} \leq 345m\Omega (V_{GS} = -4.5V)$

● General Description

The TPM04K20BX is P-Channel enhancement MOSFET Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$, with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit.

● Pin Configurations

● Package Information


COMMON DIMENSIONS(MM)			
PKG.	X1: EXTREME THIN		
REF.	MIN.	NOM.	MAX
A	>0.40	-	0.50
A1	0.00	-	0.05
A3	0.125 REF.		
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b1	0.10	0.15	0.20
b2	0.20	0.25	0.30
L1	0.20	0.30	0.40
L2	0.40	0.50	0.60
e1	0.35 BSC		
e2	0.675 BSC		

P-Channel Enhancement Mode Power MOSFET
● Absolute Maximum Ratings (@TA=25°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate Source Voltage	V_{GSS}	±8	V
Drain Current (Continuous) *AC	I_D	$T_A=25^\circ\text{C}$	-0.5
		$T_A=100^\circ\text{C}$	-0.4
Drain Current (Pulse) *B	I_{DM}	-1.2	A
Power Dissipation	P_D	0.3	W
Operating Temperature/ Storage Temperature	T_J/T_{STG}	-55~155	°C

● Thermal Characteristics

Parameter	Symbol	Ratings	Unit
Thermal Resistance ,Junction-to-Ambient	$R_{\theta JA}$	416	°C/W

● Electrical Characteristics (@TA=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$	--	--	-1	uA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-0.4	--	-1.2	V
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0V$	--	--	±10	uA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-0.3A$	--	--	345	mΩ
		$V_{GS}=-2.5V, I_D=-0.3A$	--	--	555	mΩ
Total Gate Charge	Q_g	$V_{GS}=-4.5V, V_{DS}=-10V, I_D=-0.45A$	--	0.9	--	nC
Gate- Source Charge	Q_{gs}		--	0.16	--	nC
Gate- Drain Charge	Q_{gd}		--	0.27	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=-4.5V, V_{DS}=-10V, R_{GEN}=6\Omega, I_D=-0.45A$	--	45	--	ns
Turn-on Rise Time	t_r		--	140	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	1500	--	ns
Turn-off Fall Time	t_f		--	2100	--	ns
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=-10V, f=1\text{MHZ}$	--	74.5	--	pF
Output Capacitance	C_{oss}		--	10.8	--	pF
Reverse Transfer Capacitance	C_{rss}		--	10.2	--	pF

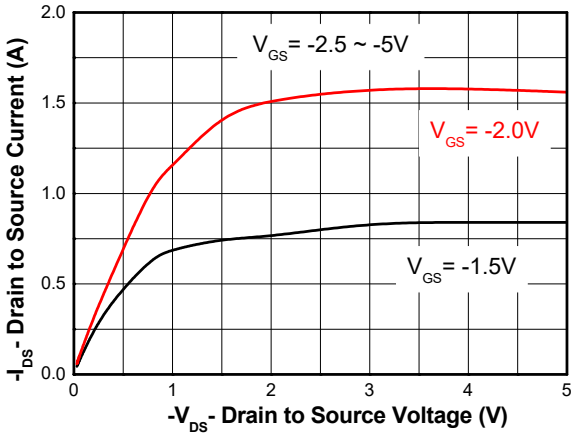
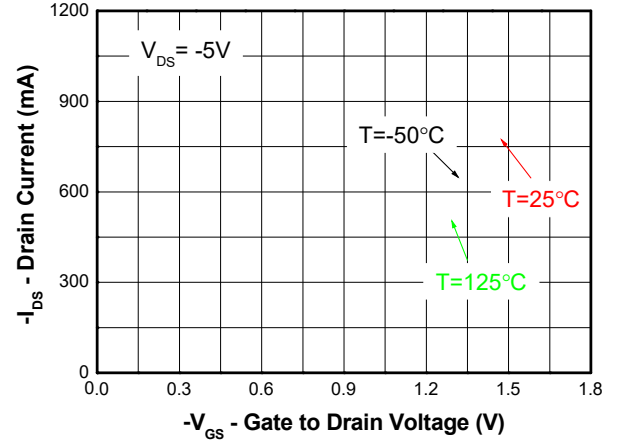
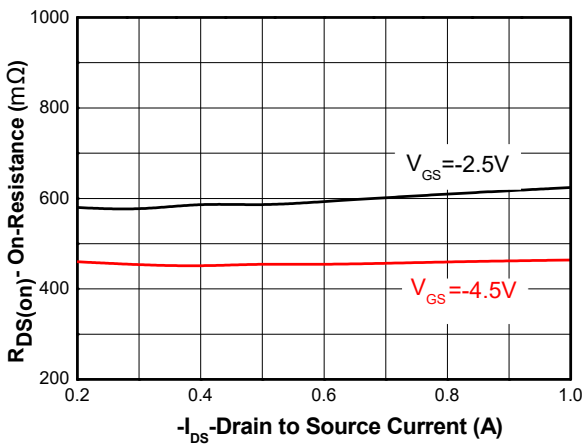
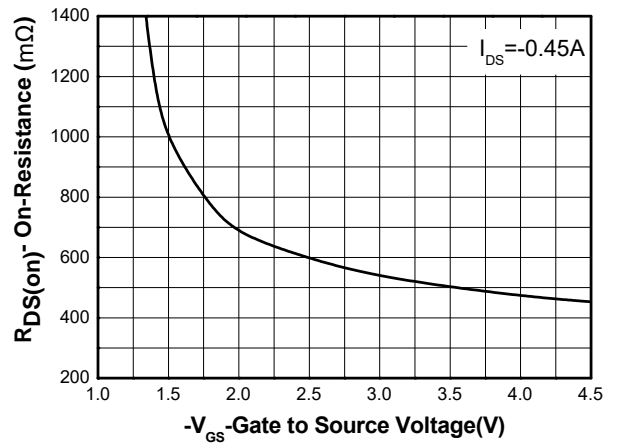
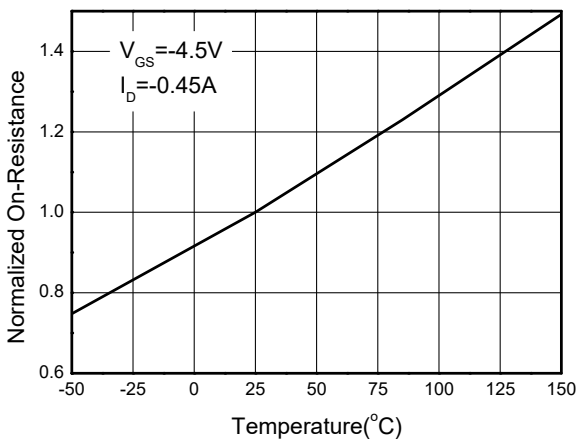
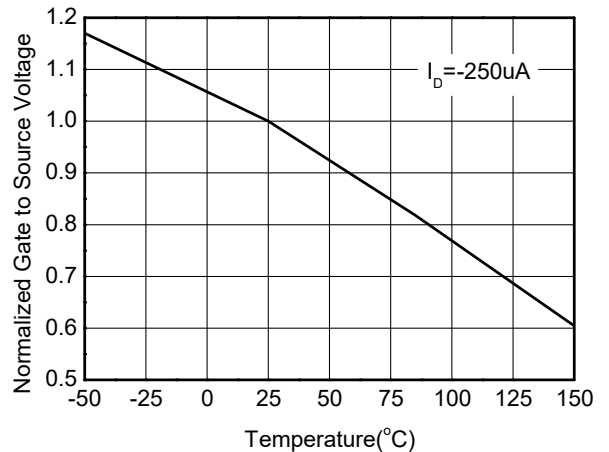
P-Channel Enhancement Mode Power MOSFET
● Reverse Diode Characteristics (@TA=25°C unless otherwise noted)

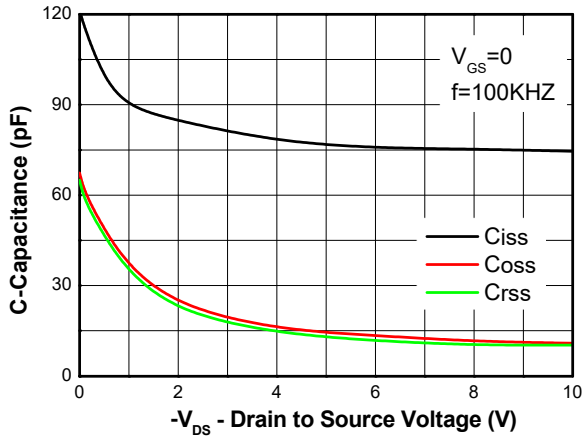
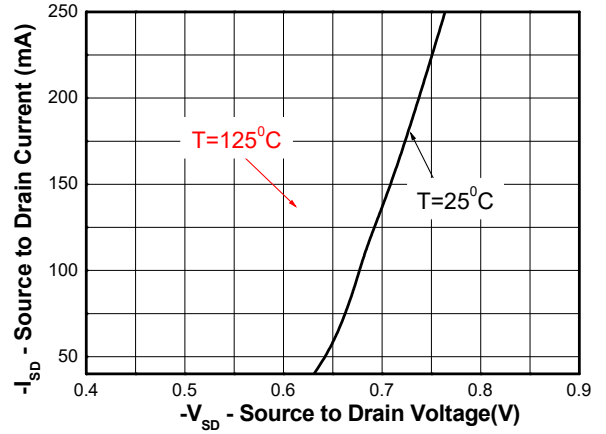
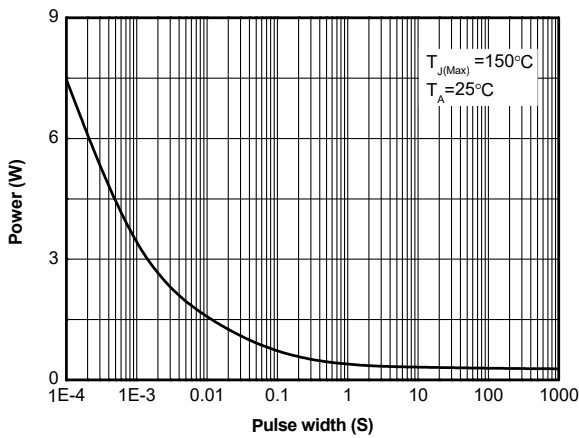
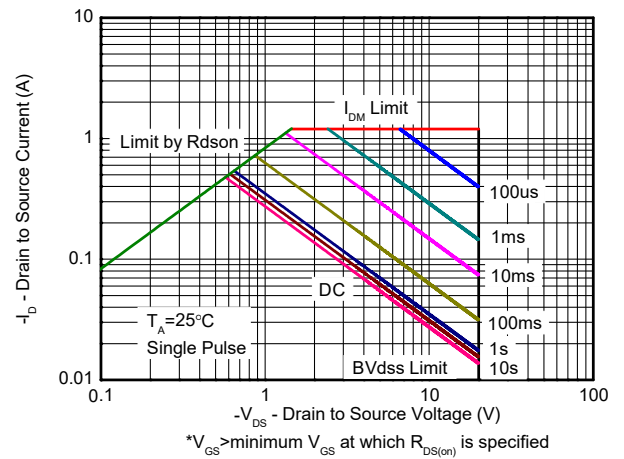
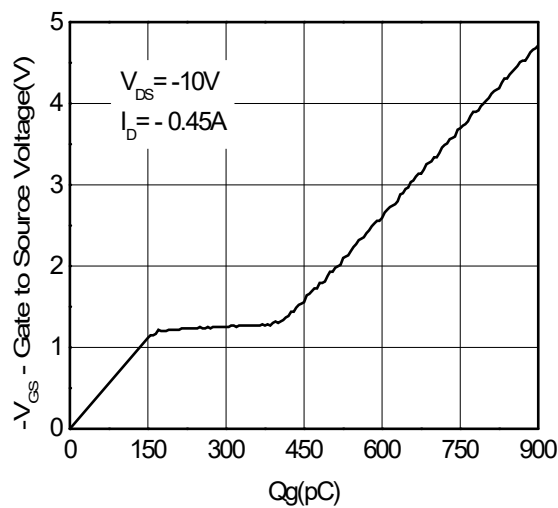
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Diode Forward Current	I_{SD}	$V_G=V_D=0V$, Force Current	--	--	-0.5	A
Diode Forward Voltage	V_{SD}	$I_{SD}=-0.5A$, $V_{GS}=0V$	--	--	-1.2	V

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25C$. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature .

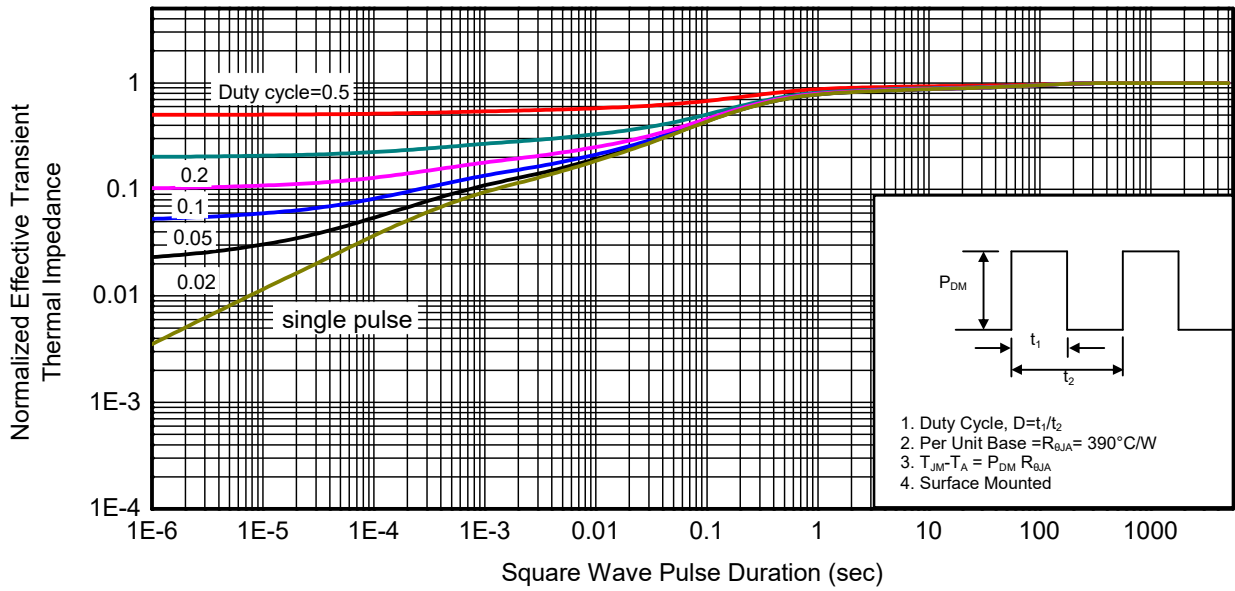
C: The current rating is based on the $t < 10s$ junction to ambient thermal resistance rating.

P-Channel Enhancement Mode Power MOSFET
● TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Output characteristics

Transfer characteristics

On-Resistance vs. Drain current

On-Resistance vs. Gate-to-Source voltage

On-Resistance vs. Junction temperature

Threshold voltage vs. Temperature

P-Channel Enhancement Mode Power MOSFET

Capacitance

Body diode forward voltage

Single pulse power

Safe operating power




P-Channel Enhancement Mode Power MOSFET



Transient thermal response (Junction-to-Ambient)