



20V P-Channel MOSFETs

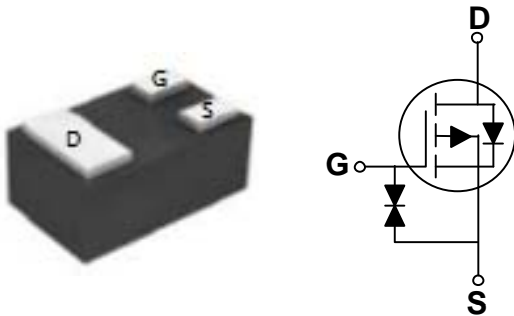
**General Description**

The TVMPB420 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltage as low as 2.5V.

This devices is suitable for use as a load switch.

$BV_{DSS}$	$R_{DS(ON)}$	$I_D$
-20 V	420 m $\Omega$	-0.7 A

SOT-883 Pin Configuration



**Features**

- $V_{DS} = -20V$ ,  $I_D = -0.7A$
- $R_{DS(ON)} < 600m\Omega @ V_{GS} = -2.5V$
- $R_{DS(ON)} < 420m\Omega @ V_{GS} = -4.5V$
- Lead free product is acquired
- Surface mount package

**Applications**

- Load Switch

**Absolute Maximum Ratings  $T_A=25^\circ C$  unless otherwise noted**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-20	V
$V_{GS}$	Gate-Source Voltage	$\pm 8$	V
$I_D$	Drain Current - Continuous ( $T_C=25^\circ C$ )	-0.7	A
	Drain Current - Continuous ( $T_C=70^\circ C$ )	-0.55	A
$I_{DM}$	Drain Current - Pulsed (NOTE 1)	-2	A
$P_D$	Maximum Power Dissipation	0.9	W
$T_J$	Operating Junction Temperature Range	-50 to 150	$^\circ C$
$T_{STG}$	Storage Temperature Range	-50 to 150	$^\circ C$

**Thermal Characteristics**

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (NOTE 2)	---	80	$^\circ C/W$

**Electrical Characteristics ( $T_A=25^\circ\text{C}$ , unless otherwise noted)****Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	---	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=-20V, V_{GS}=0V$	---	---	-1	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 8V, V_{DS}=0V$	---	---	$\pm 100$	nA

**On Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5V, I_D=-0.5A$	---	360	420	m $\Omega$
		$V_{GS}=-2.5V, I_D=-0.3A$	---	400	500	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.45	-0.6	-1.0	V

**Dynamic and switching Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$Q_g$	Total Gate Charge	$V_{DS}=-4V, V_{GS}=-4.5V, I_D=-0.5A$	---	0.8	---	nC
$Q_{gs}$	Gate-Source Charge		---	0.16	---	
$Q_{gd}$	Gate-Drain Charge		---	0.2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-4V, V_{GEN}=-4.5V, R_L=-1.2\Omega, I_D=-0.3A, R_g=1\Omega$	---	6	---	nS
$T_r$	Rise Time		---	5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	23	---	
$T_f$	Fall Time (NOTE 2、3)		---	8	---	
$C_{iss}$	Input Capacitance	$V_{DS}=-4V, V_{GS}=0V, F=1\text{MHz}$	---	52	---	pF
$C_{oss}$	Output Capacitance		---	12	---	
$C_{rss}$	Reverse Transfer Capacitance		---	8.2	---	

**Drain-Source Diode Characteristics and Ratings**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Diode Forward Current (NOTE 2)		---	---	-0.7	A
$V_{SD}$	Diode Forward Voltage (NOTE 3)	$V_{GS}=0V, I_S=-0.5A$	---	---	-1.2	V

## NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. Surface mounted on FR4 board,  $t \leq 10$  sec.
3. Pulse Test : Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject production.



Characteristics Curves

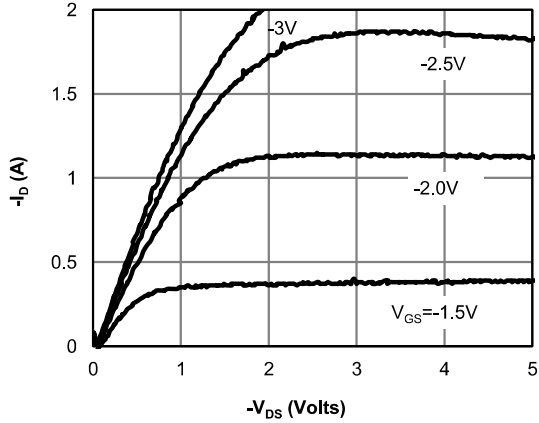


Fig 1: On-Region Characteristics

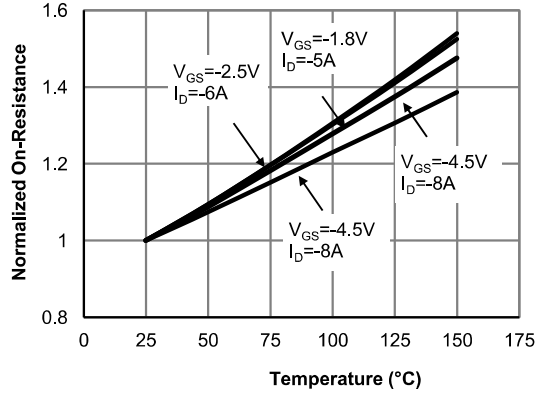


Figure 2: On-Resistance vs. Junction Temperature

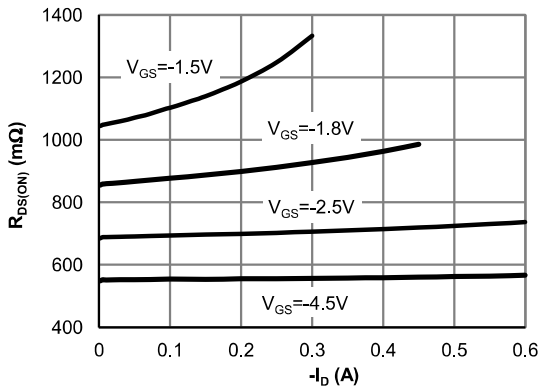


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

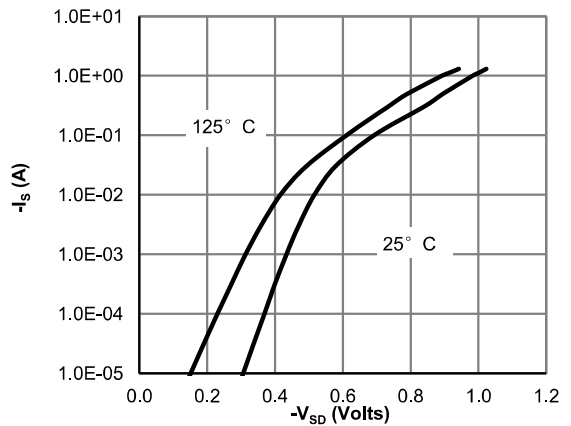


Figure 4: Body-Diode Characteristics

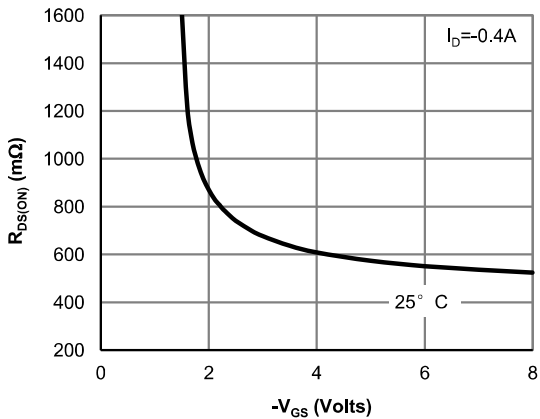


Figure 5: On-Resistance vs. Gate-Source Voltage

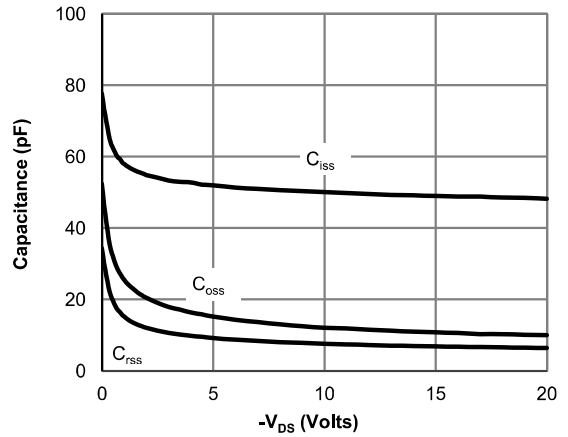


Figure 6: Capacitance Characteristics



Characteristics Curves

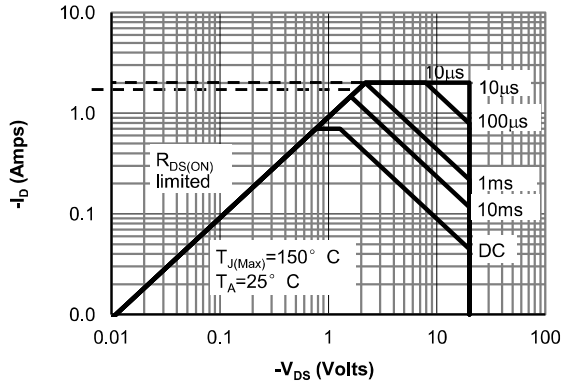


Figure 7: Maximum Forward Biased Safe Operating Area

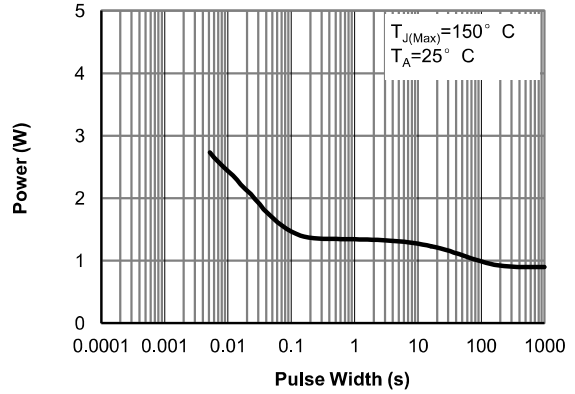


Figure 8: Single Pulse Power Rating Junction-to-Ambient

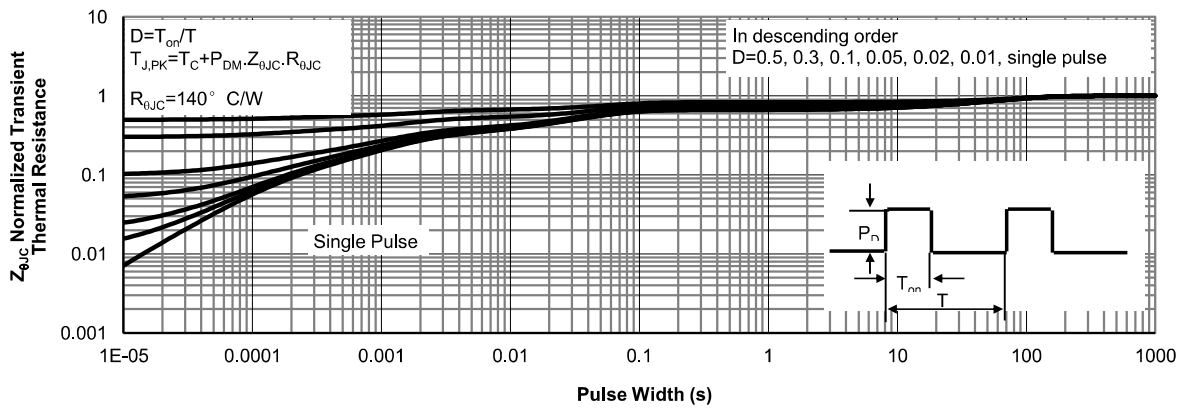


Figure 9: Normalized Maximum Transient Thermal Impedance



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