

# PT2302A

## 20V N-Channel Enhancement Mode MOSFET

VDS= 20V

RDS(ON), Vgs@ 4.5V, Ids@ 3A <45mΩ

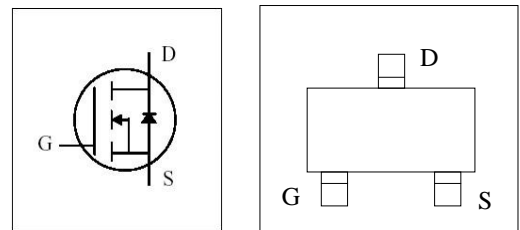
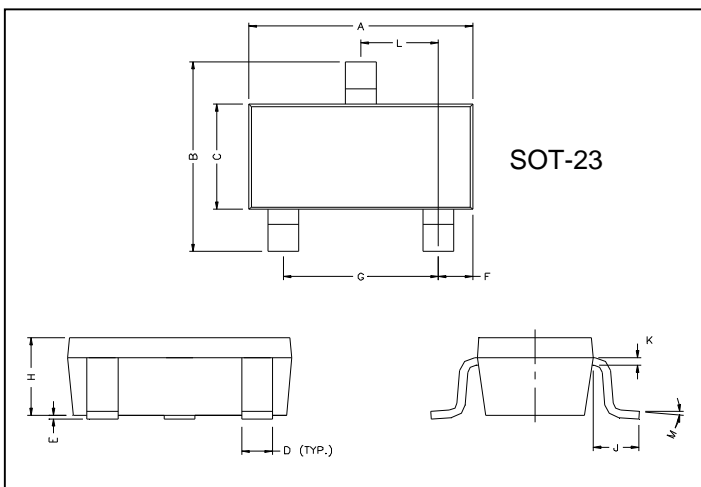
RDS(ON), Vgs@ 2.5V, Ids@ 2.5A < 59mΩ

### Features

Advanced trench process technology

High Density Cell Design For Ultra Low On-Resistance

### Package Dimensions



REF.	Millimeter		REF.	Millimete	
	Min.	Max.		Min.	Max.
A	2.80	3.00	G	1.80	2.00
B	2.30	2.50	H	0.90	1.1
C	1.20	1.40	K	0.10	0.20
D	0.30	0.50	J	0.35	0.70
E	0	0.10	L	0.92	0.98
F	0.45	0.55	M	0°	10°

### Maximum Ratings and Thermal Characteristics (TA = 25oC unless otherwise noted)

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V <sub>DS</sub>	20	V	
Gate-Source Voltage	V <sub>GS</sub>	±10		
Continuous Drain Current	I <sub>D</sub>	3	A	
Pulsed Drain Current <sup>1)</sup>	I <sub>DM</sub>	12		
Maximum Power Dissipation <sup>2)</sup>	P <sub>D</sub>	TA = 25°	1.25	W
		TA = 75°C	0.8	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150	°C	
Junction-to-Ambient Thermal Resistance (PCB mounted) <sup>2)</sup>	R <sub>thJA</sub>	100	°C/W	
Junction-to-Ambient Thermal Resistance (PCB mounted) <sup>3)</sup>		166		

#### Notes

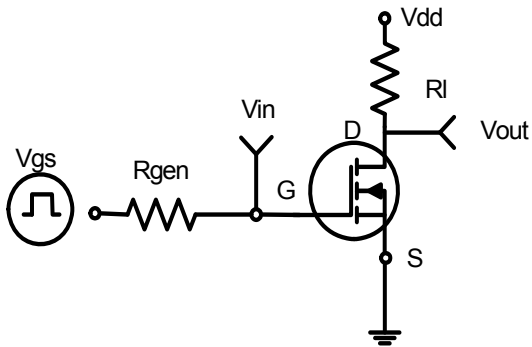
- <sup>1)</sup> Pulse width limited by maximum junction temperature.
- <sup>2)</sup> Surface Mounted on FR4 Board, t ≤ 5 sec.
- <sup>3)</sup> Surface Mounted on FR4 Board.

## ELECTRICAL CHARACTERISTICS

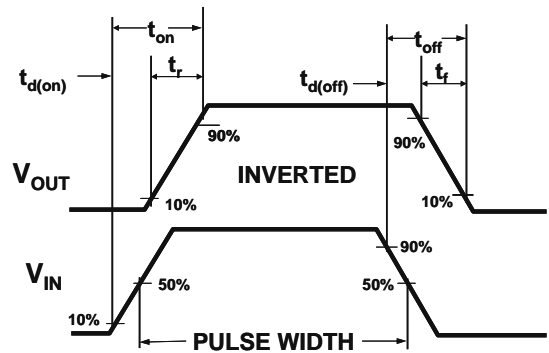
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Drain-Source On-State Resistance <sup>1)</sup>	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 3A$		30	45	m $\Omega$
		$V_{GS} = 2.5V, I_D = 2.5A$		37	59	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.45		1.5	V
Zero Gate Voltage Drain Current 0	$I_{DSS}$	$V_{DS} = 16V, V_{GS} = 0V$			1	$\mu A$
Gate Body Leakage	$I_{GSS}$	$V_{GS} = \pm 10V, V_{DS} = 0V$			$\pm 100$	nA
Forward Transconductance <sup>1)</sup>	$g_{fs}$	$V_{DS} = 5V, I_D = 3A$		10	—	S
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 10V, I_D = 3A$ $V_{GS} = 4.5V$		2.9		nC
Gate-Source Charge	$Q_{gs}$			0.4		
Gate-Drain Charge	$Q_{gd}$			0.6		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10V, R_L = 3.3\Omega$ $V_{GEN} = 4.5V$ $R_G = 6\Omega$		2.5		ns
Turn-On Rise Time	$t_r$			3.2		
Turn-Off Delay Time	$t_{d(off)}$			21		
Turn-Off Fall Time	$t_f$			3		
Input Capacitance	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V$ $f = 1.0\text{ MHz}$		260		pF
Output Capacitance	$C_{oss}$			48		
Reverse Transfer Capacitance	$C_{rss}$			27		
<b>Source-Drain Diode</b>						
Max. Diode Forward Current	$I_S$				1.6	A
Diode Forward Voltage	$V_{SD}$	$I_S = 1.0A, V_{GS} = 0V$			1.2	V

<sup>1)</sup> Pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$

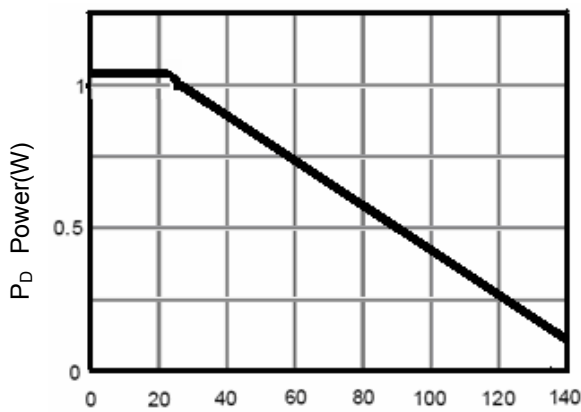
**Typical Electrical and Thermal Characteristics**



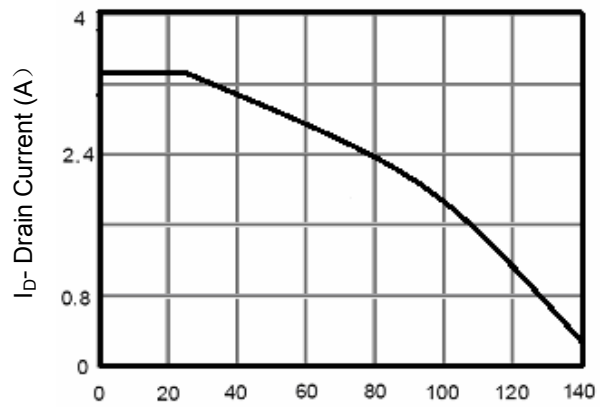
**Figure 1: Switching Test Circuit**



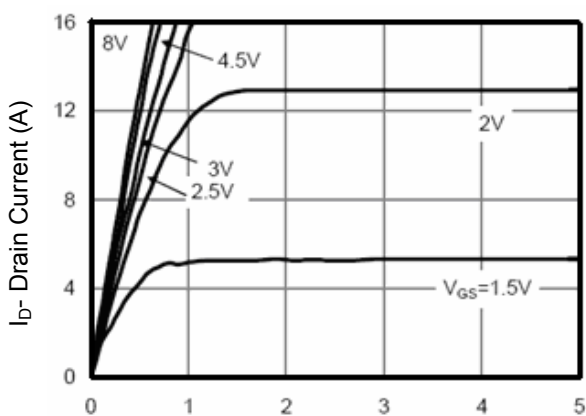
**Figure 2: Switching Waveforms**



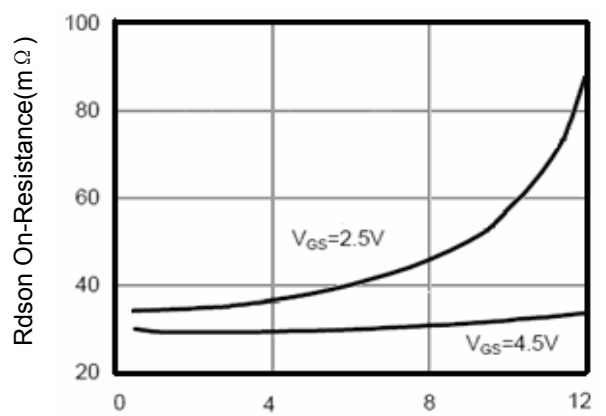
**Figure 3 Power Dissipation**



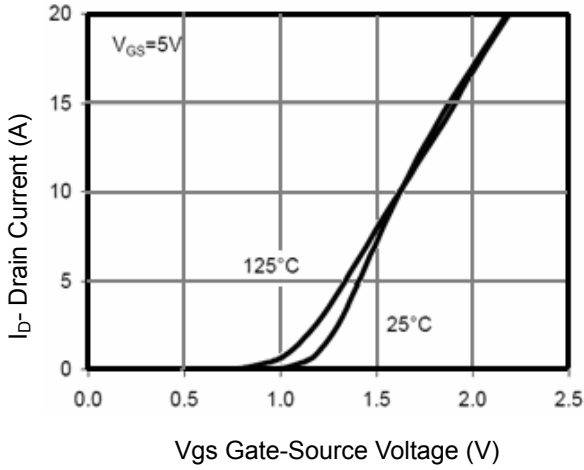
**Figure 4 Drain Current**



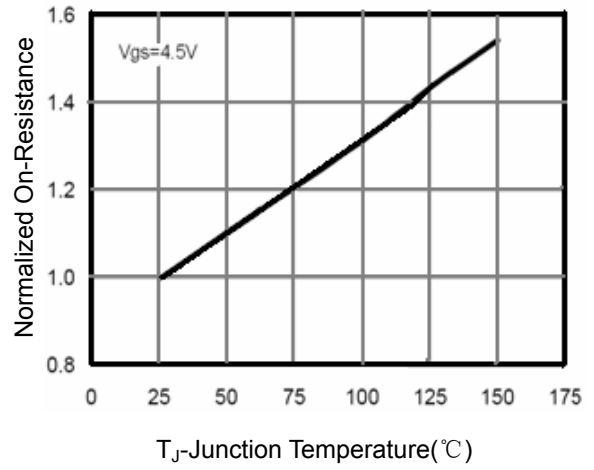
**Figure 5 Output Characteristics**



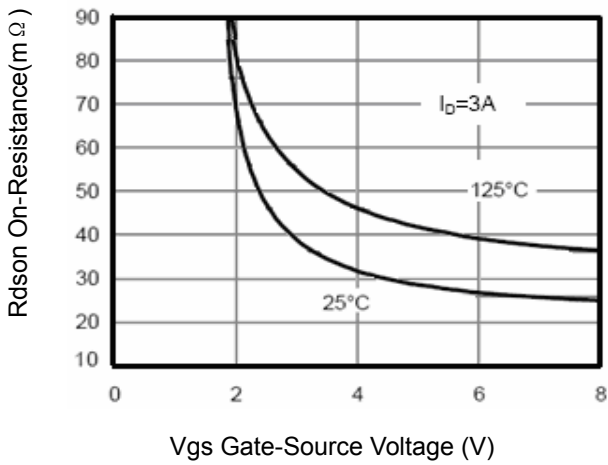
**Figure 6 Drain-Source On-Resistance**



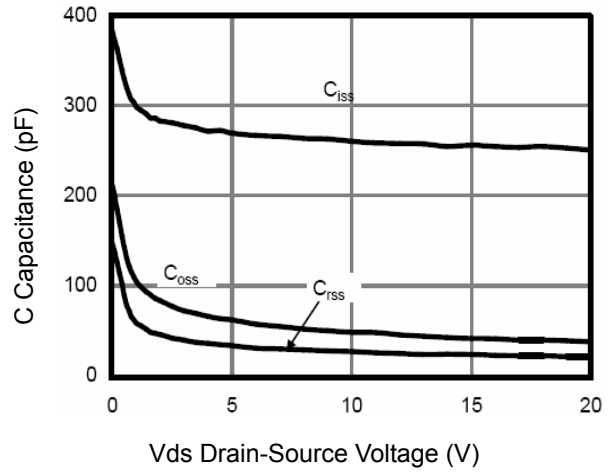
**Figure 7 Transfer Characteristics**



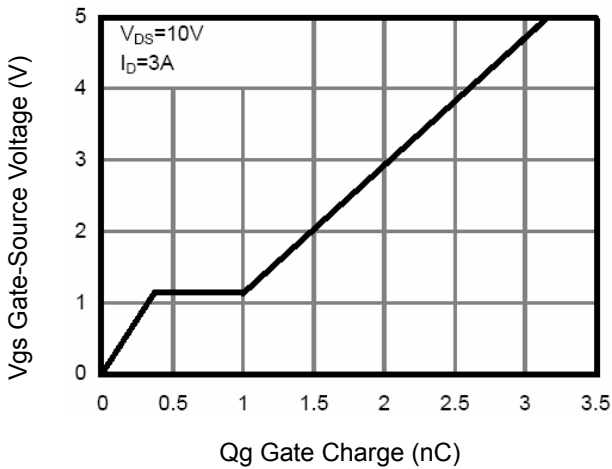
**Figure 8 Drain-Source On-Resistance**



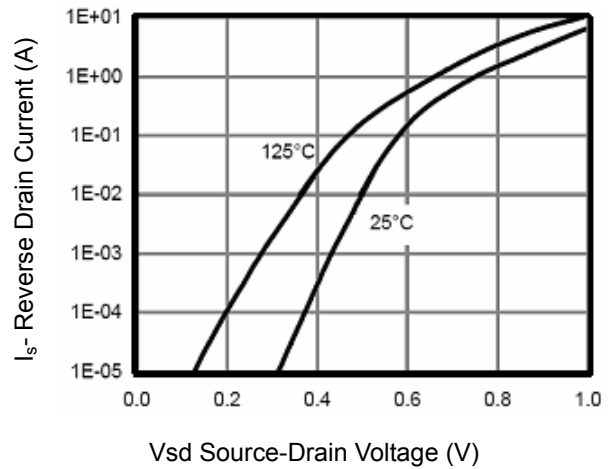
**Figure 9 Rdson vs Vgs**



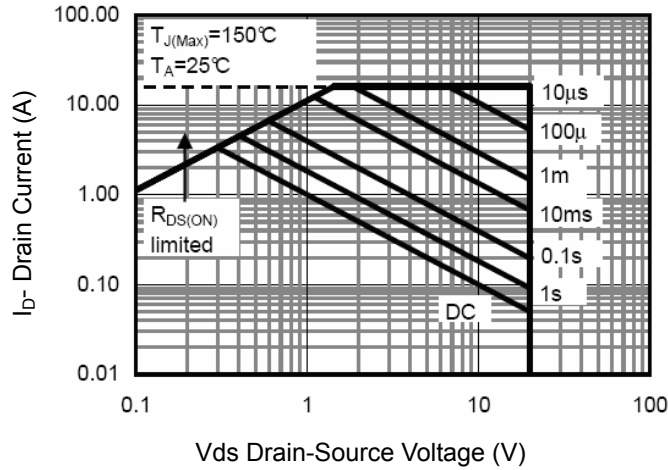
**Figure 10 Capacitance vs Vds**



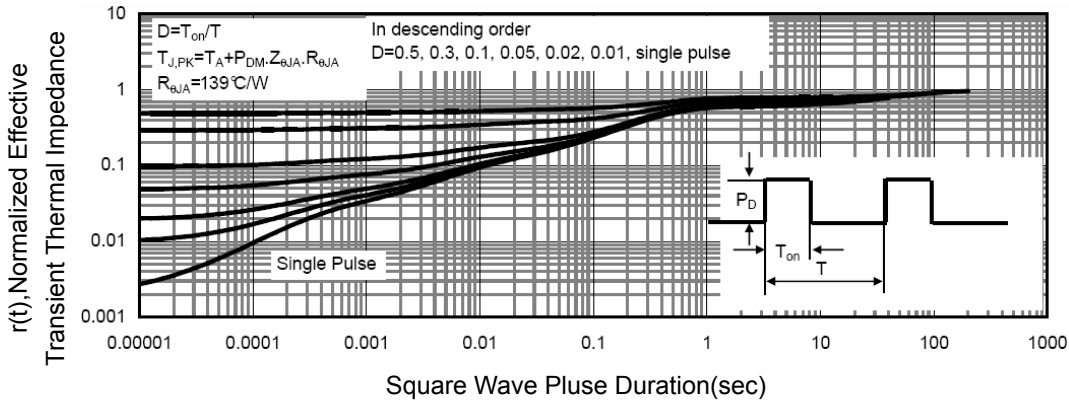
**Figure 11 Gate Charge**



**Figure 12 Source- Drain Diode Forward**



**Figure 13 Safe Operation Area**



**Figure 14 Normalized Maximum Transient Thermal Impedance**

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [MOSFET](#) category:*

*Click to view products by [PUOLOP](#) manufacturer:*

Other Similar products are found below :

[614233C](#) [648584F](#) [IRFD120](#) [IRFF430](#) [JANTX2N5237](#) [2N7000](#) [FCA20N60\\_F109](#) [FDZ595PZ](#) [AOD464](#) [2SK2267\(Q\)](#) [2SK2545\(Q,T\)](#)  
[405094E](#) [423220D](#) [MIC4420CM-TR](#) [VN1206L](#) [614234A](#) [715780A](#) [SSM6J414TU,LF\(T](#) [751625C](#) [PSMN4R2-30MLD](#)  
[TK31J60W5,S1VQ\(O](#) [2SK2614\(TE16L1,Q\)](#) [DMN1017UCP3-7](#) [EFC2J004NUZTDG](#) [FCAB21350L1](#) [P85W28HP2F-7071](#) [DMN1053UCP4-7](#)  
[NTE2384](#) [NTE2969](#) [NTE6400A](#) [DMN2080UCB4-7](#) [DMN61D9UWQ-13](#) [US6M2GTR](#) [DMN31D5UDJ-7](#) [SSM6P54TU,LF](#) [DMP22D4UFO-](#)  
[7B](#) [IPS60R3K4CEAKMA1](#) [DMN1006UCA6-7](#) [DMN16M9UCA6-7](#) [STF5N65M6](#) [STU5N65M6](#) [C3M0021120D](#) [DMN13M9UCA6-7](#)  
[BSS340NWH6327XTSA1](#) [MCM3400A-TP](#) [DMTH10H4M6SPS-13](#) [IRF40SC240ARMA1](#) [IPS60R1K0PFD7SAKMA1](#)  
[IPS60R360PFD7SAKMA1](#) [IPS60R600PFD7SAKMA1](#)