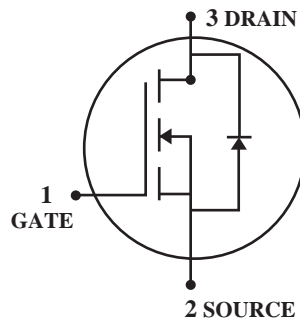


## N-Channel Enhancement Mode Power MOSFET

 Lead(Pb)-Free

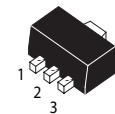


**DRAIN CURRENT**  
**5.0 AMPERES**

**DRAIN SOURCE VOLTAGE**  
**60 VOLTAGE**

### Features:

- \* Simple Drive Requirement.
- \* Super High Density Cell Design for Extremely Low  $R_{DS(ON)}$ .



1. GATE  
2. DRAIN  
3. SOURCE

**SOT-89**

## Maximum Ratings ( $T_A=25^\circ\text{C}$ Unless Otherwise Specified)

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	$T_A=25^\circ\text{C}$ 5.0 $T_A=70^\circ\text{C}$ 4.0	A
Pulsed Drain Current	$I_{DM}$	10	A
Total Power Dissipation ( $T_A=25^\circ\text{C}$ )	$P_D$	1.50	W
Maximum Junction-Ambient <sup>3</sup>	$R_{\theta JA}$	83.3	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	$T_J$	-55~+150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55~+150	$^\circ\text{C}$

Note 1. Pulse width limited by Max. junction temperature.

2. Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .

3. Surface mounted on FR4 board,  $t \leq 10\text{sec}$ .

## Device Marking

WTM2310A = 2310A

**Electrical Characteristics (T<sub>j</sub> = 25°C unless otherwise specified)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =250uA
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.5	-	1.5	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA
Forward Transconductance	g <sub>fs</sub>	-	12	-	S	V <sub>DS</sub> =15V, I <sub>D</sub> =4A
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±20V
Drain-Source Leakage Current(T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	1	uA	V <sub>DS</sub> =60V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> =55°C)		-	-	10	uA	V <sub>DS</sub> =60V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance	R <sub>Ds(ON)</sub>	-	-	115	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =5.0A
		-	-	125		V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.5A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	4.0	-	nC	I <sub>D</sub> =4A V <sub>DS</sub> =30V V <sub>GS</sub> =4.5V
Gate-Source Charge	Q <sub>gs</sub>	-	1.2	-		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	1.0	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	6	-	ns	V <sub>DD</sub> =30V I <sub>D</sub> =2.5A V <sub>GS</sub> =10V R <sub>G</sub> =6Ω R <sub>L</sub> =12Ω
Rise Time	T <sub>r</sub>	-	12	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	18	-		
Fall Time	T <sub>f</sub>	-	10	-		
Input Capacitance	C <sub>iss</sub>	-	320	-	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =30V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	42	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	20	-		

**Source-Drain Diode**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	1.2	V	I <sub>S</sub> =2.5A, V <sub>GS</sub> =0V

Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on FR4 board, t ≤ 10sec.

### Characteristics Curve

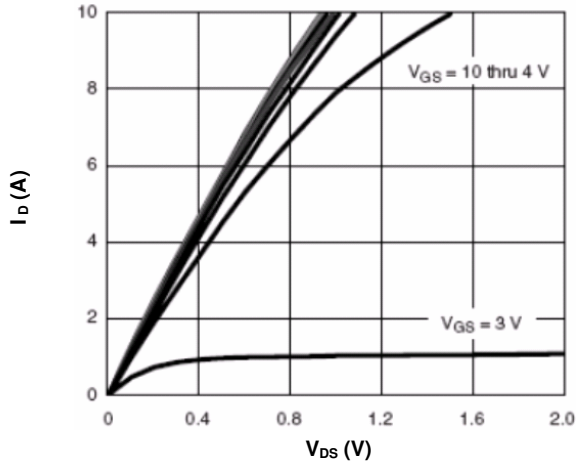


Fig 1. Typical Output Characteristics

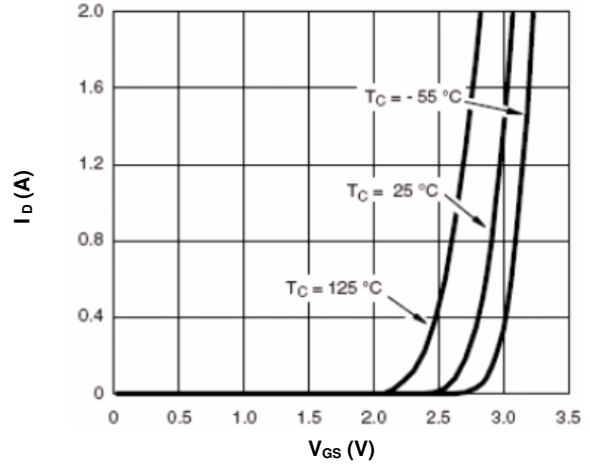


Fig 2. Transfer Characteristics

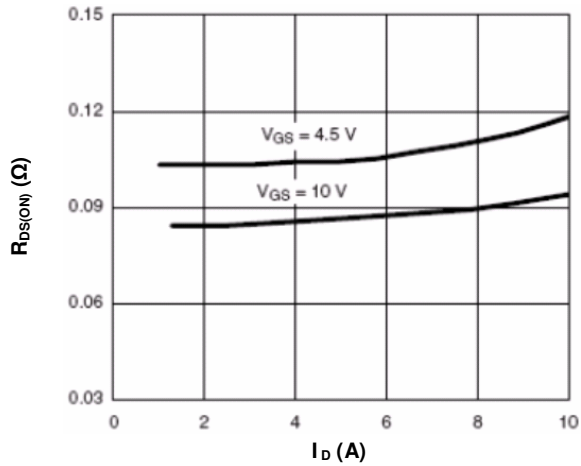


Fig 3. On-Resistance vs. Drain Current and Gate Voltage

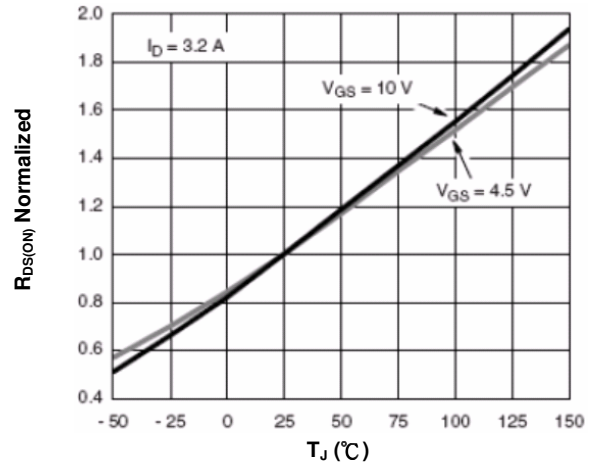


Fig 4. On-Resistance vs. Junction Temperature

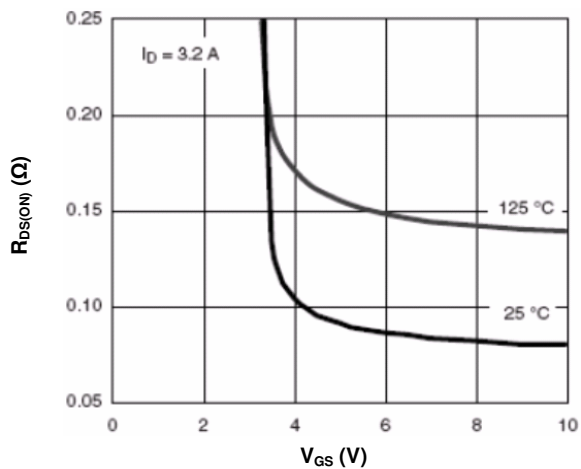


Fig 5. On-Resistance vs. Gate-Source Voltage

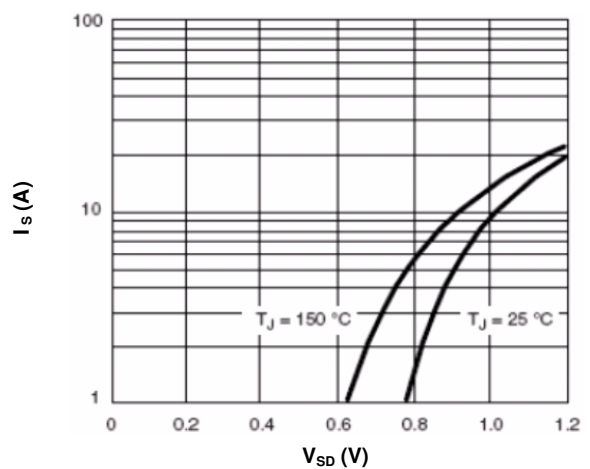
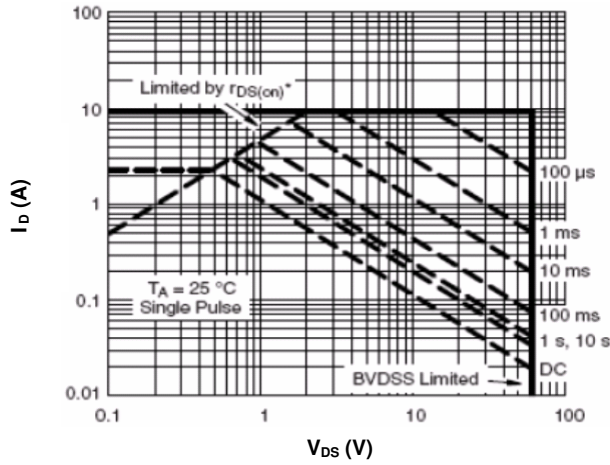
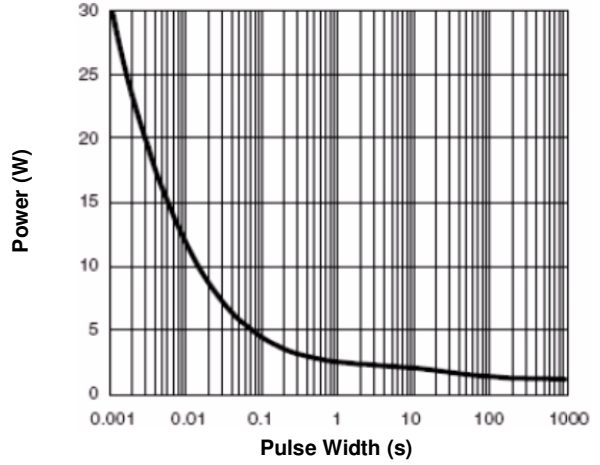


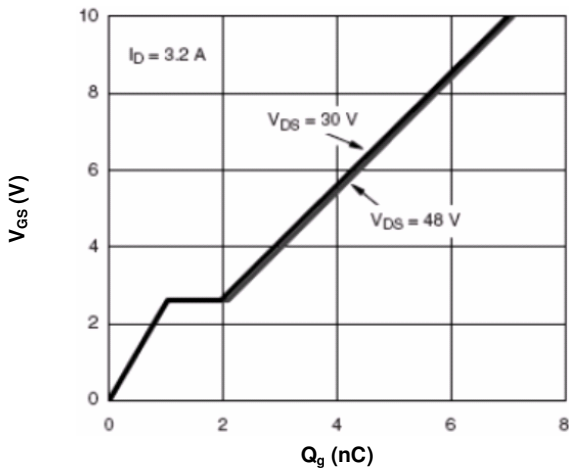
Fig 6. Body Diode Characteristics



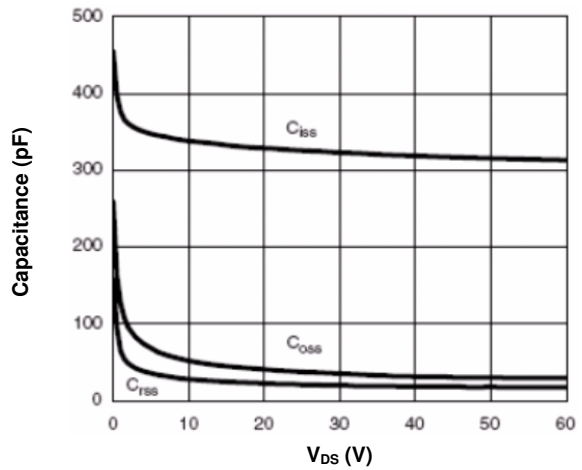
**Fig 7. Maximum Safe Operating Area**



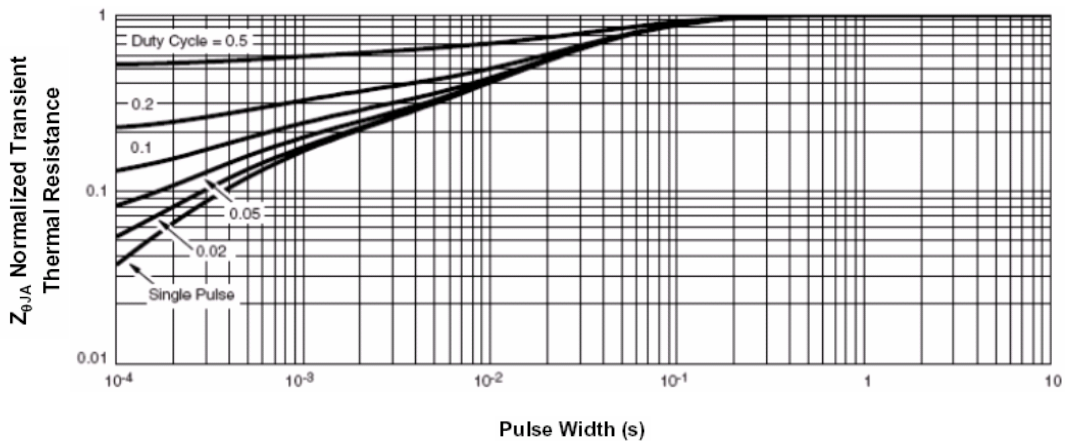
**Fig 8. Single Pulse Maximum Power Dissipation**



**Fig 9. Gate Charge Characteristics**



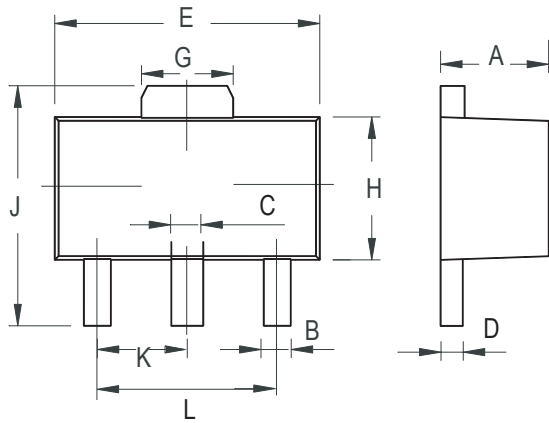
**Fig 10. Typical Capacitance Characteristics**



**Fig 11. Normalized Maximum Transient Thermal Impedance**

**SOT-89 Outline Dimensions**

unit:mm



<b>SOT-89</b>		
<b>Dim</b>	<b>Min</b>	<b>Max</b>
<b>A</b>	1.400	1.600
<b>B</b>	0.320	0.520
<b>C</b>	0.360	0.560
<b>D</b>	0.350	0.440
<b>E</b>	4.400	4.600
<b>G</b>	1.400	1.800
<b>H</b>	2.300	2.600
<b>J</b>	3.940	4.250
<b>K</b>	1.500TYP	
<b>L</b>	2.900	3.100