WG3415

20V P-Channel MOSFET

SOT-23

RoHS COMPLIANT

Features:

☐ Low Intrinsic Capacitances.

☐ Excellent Switching Characteristics.

☐ Extended Safe Operating Area.

☐ Unrivalled Gate Charge :Qg= 12nC (Typ.).

☐ BVDSS=-20V,I_D=-4A

☐ R_{DS}(on) : 45mΩ (Max) @V$_G$=-4.5V

☐ 100% Avalanche Tested

Marking:AF9

Top View

Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±10	V
Drain Current-Continuous	I_D	-4	A
Drain Current-Pulsed (Note 1)	I_{DM}	-30	A
Maximum Power Dissipation	P_D	1.4	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Parameter	Symbol	Limit	Unit
Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	89.3	℃/W

Electrical Characteristics (TA=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{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	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm10V,V_{DS}=0V$	-	-	±10	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS},I_D=-250\mu A$	-0.35	-0.55	-0.9	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V$, $I_D=-4A$	-	34	45	mΩ
		$V_{GS}=-2.5V$, $I_D=-4A$	-	44	60	mΩ
Forward Transconductance	g_{FS}	$V_{DS}=-5V,I_D=-4A$	8	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	$V_{DS}=-10V,V_{GS}=0V$, F=1.0MHz	-	950	-	PF
Output Capacitance	C_{oss}		-	165	-	PF
Reverse Transfer Capacitance	C_{rss}		-	120	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-10V,R_L=2. 5\Omega$ $V_{GS}=-4.5V,R_{GEN}=3\Omega$	-	12		nS
Turn-on Rise Time	t_r		-	10		nS
Turn-Off Delay Time	$t_{d(off)}$		-	19		nS
Turn-Off Fall Time	t_f		-	25		nS
Total Gate Charge	Q_g	$V_{DS}=-10V,I_D=-4A$, $V_{GS}=-4.5V$	-	12		nC
Gate-Source Charge	Q_{gs}		-	1.4	-	nC
Gate-Drain Charge	Q_{gd}		-	3.6	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V,I_S=-4A$	-	-	-1.2	V
Diode Forward Current (Note 2)	I_S		-	-	-4	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, t ≤ 10 sec.

3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

4. Guaranteed by design, not subject to production

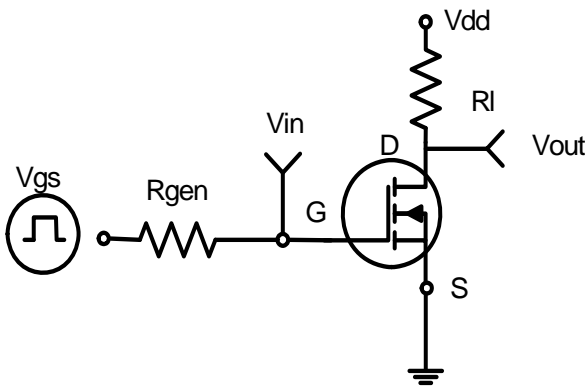**Typical Electrical and Thermal Characteristics** 20V P-Channel MOSFET
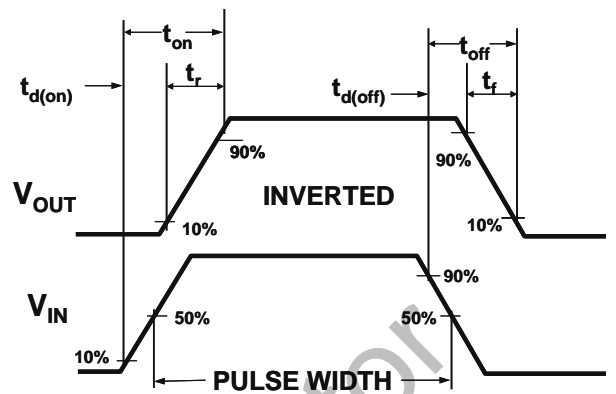
Figure 1:Switching Test Circuit
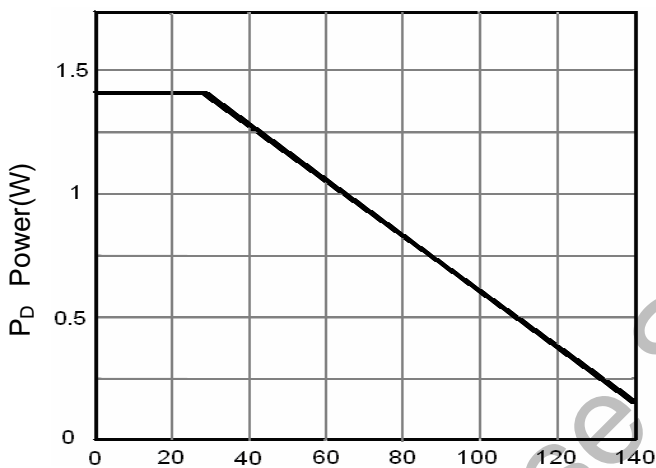
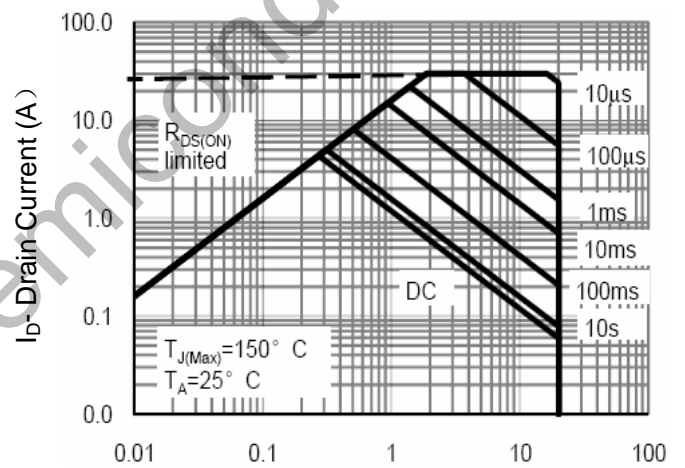**Figure 2:Switching Waveforms**

Figure 3 Power Dissipation

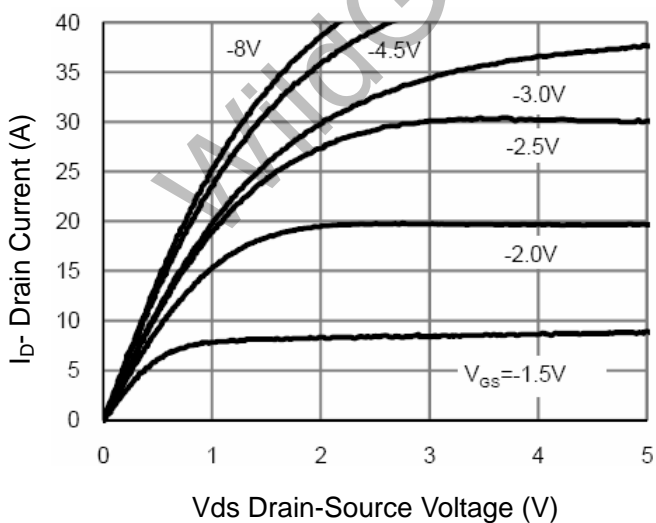**Figure 4 Safe Operation Area**

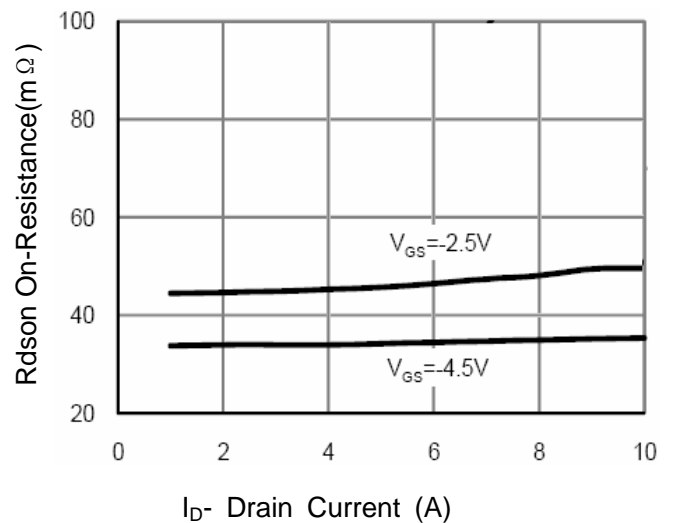**Figure 5 Output Characteristics**
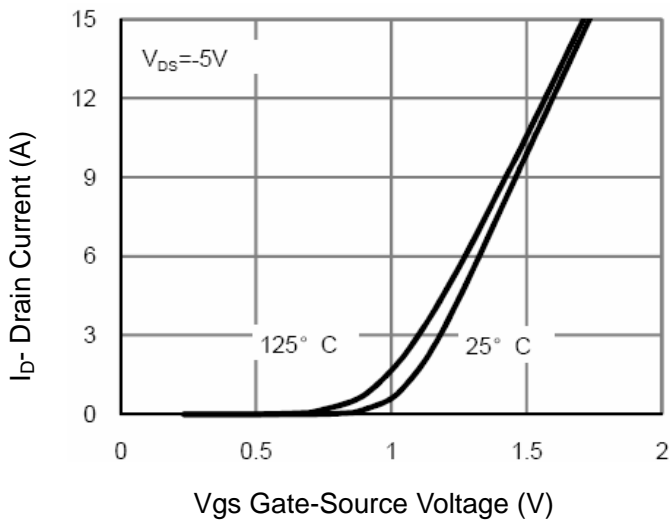
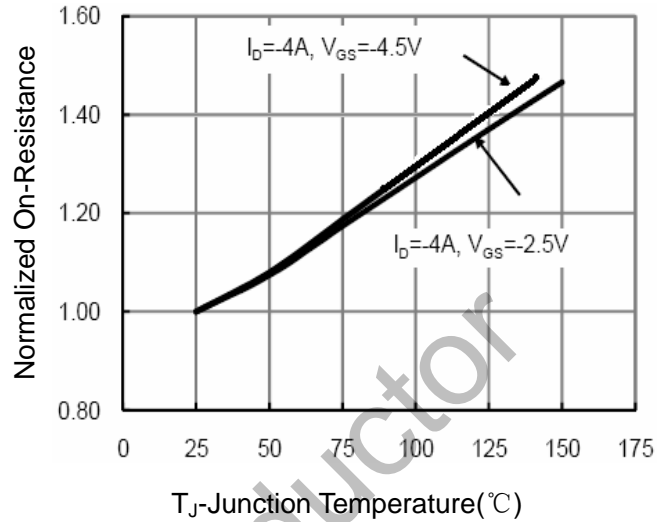**Figure 6 Drain-Source On-Resistance**

Figure 7 Transfer Characteristics
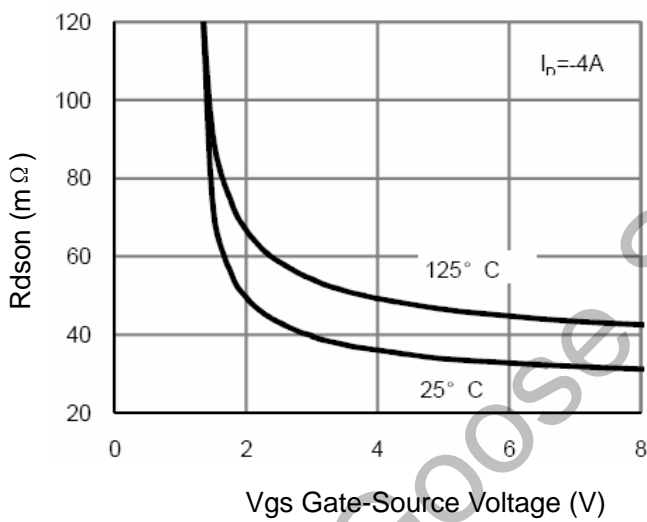

Figure 8 Drain-Source On-Resistance
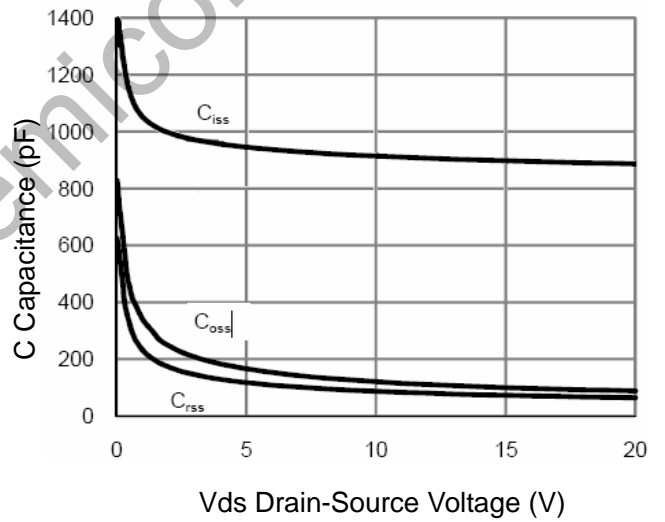

Figure 9 Rdson vs Vgs

Figure 10 Capacitance vs Vds

Figure 11 Gate Charge

Figure 12 Source- Drain Diode Forward

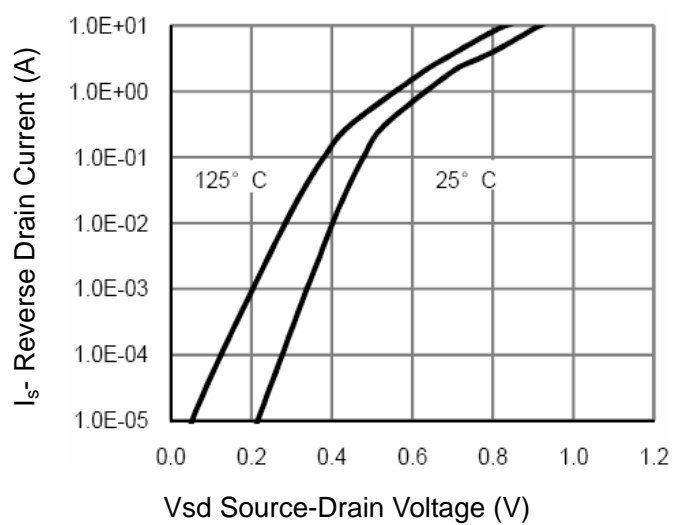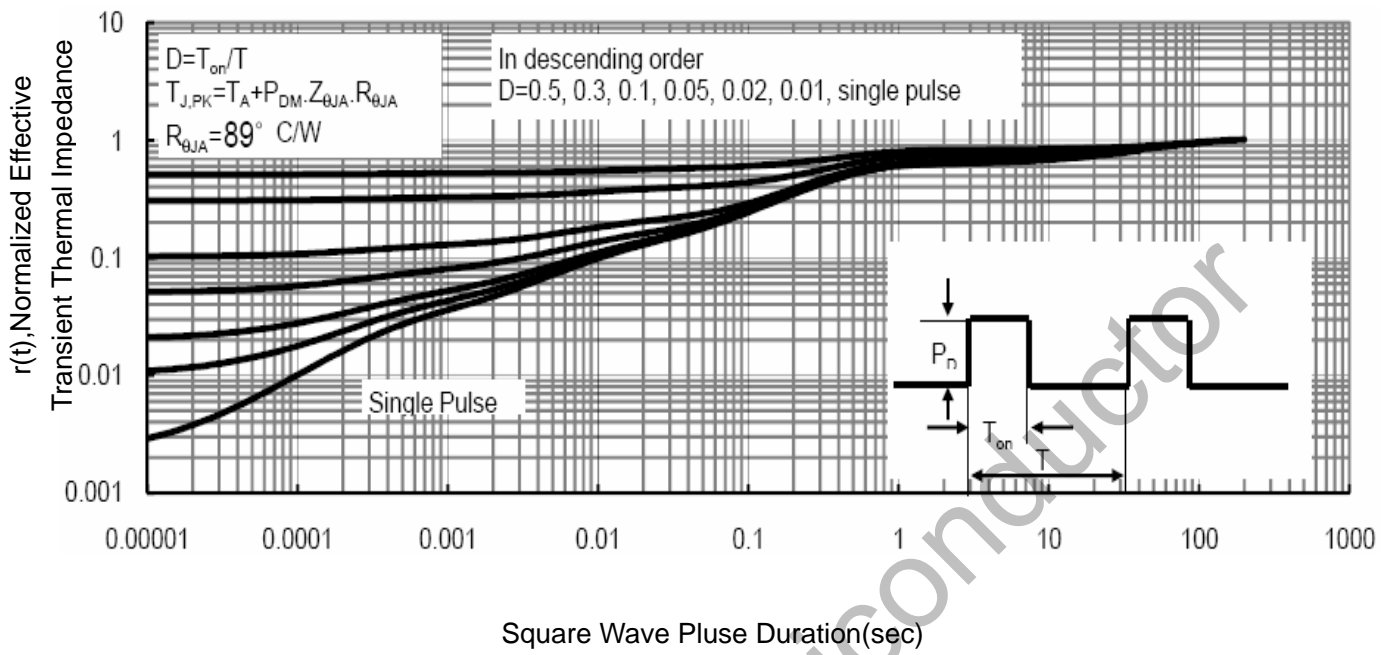Square Wave Pluse Duration(sec)

Figure 13 Normalized Maximum Transient Thermal Impedance

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