DESCRIPTION

The G1601 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

●

| V_{DSS}	$R_{DS(ON)}$ @-4.5V(Typ)	$R_{DS(ON)}$ @-2.5V(Typ)	I_D
-20V	55mΩ	70mΩ	-2.6A

● High Power and current handing capability
● Lead free product is acquired
● Surface Mount Package

Application

● PWM applications
● Load switch
● Power management
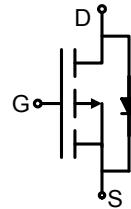
Schematic diagram

G1601
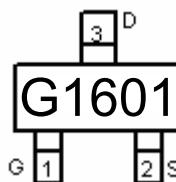
Marking and pin Assignment

SOT-23

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	-2.6	A
Drain Current -Pulsed (Note 1)	I_{DM}	-10	A
Maximum Power Dissipation	P_D	0.9	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{θJA}$	125	℃/W

Electrical Characteristics (TA=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250μA$	-18	-20	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-16V, V_{GS}=0V$	-	-	-1	μA

Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm12V, V_{DS}=0V$	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5	-0.7	-1	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-2.6A$	-	55	90	mΩ
		$V_{GS}=-2.5V, I_D=-2A$	-	70	110	mΩ
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-2.8A$	-	9.5	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	$V_{DS}=-10V, V_{GS}=0V,$ F=1.0MHz	-	405	-	PF
Output Capacitance	C_{oss}		-	75	-	PF
Reverse Transfer Capacitance	C_{rss}		-	55	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-1A$ $V_{GS}=-4.5V, R_{GEN}=10\Omega$	-	11	-	nS
Turn-on Rise Time	t_r		-	35	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	t_f		-	10	-	nS
Total Gate Charge	Q_g	$V_{DS}=-10V, I_D=-2.6A,$ $V_{GS}=-2.5V$	-	3.3	12	nC
Gate-Source Charge	Q_{gs}		-	0.7	-	nC
Gate-Drain Charge	Q_{gd}		-	1.3	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=1.3A$	-	-	-1.2	V
Diode Forward Current (Note 2)	I_S		-	-	-1.3	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
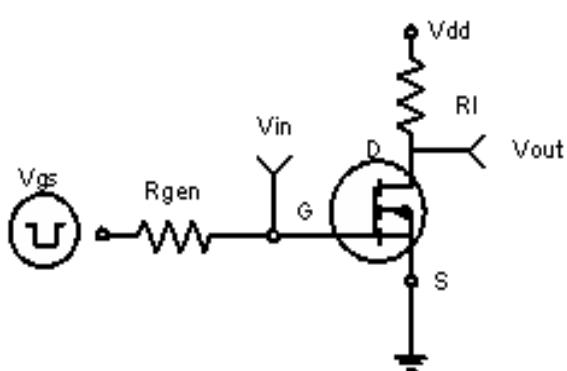

Figure 1:Switching Test Circuit
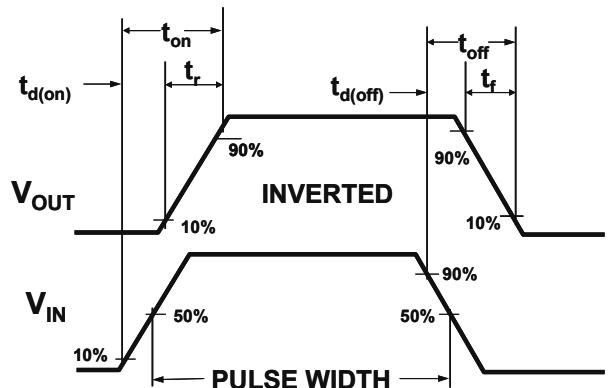

Figure 2:Switching Waveforms

T_J-Junction Temperature(℃)
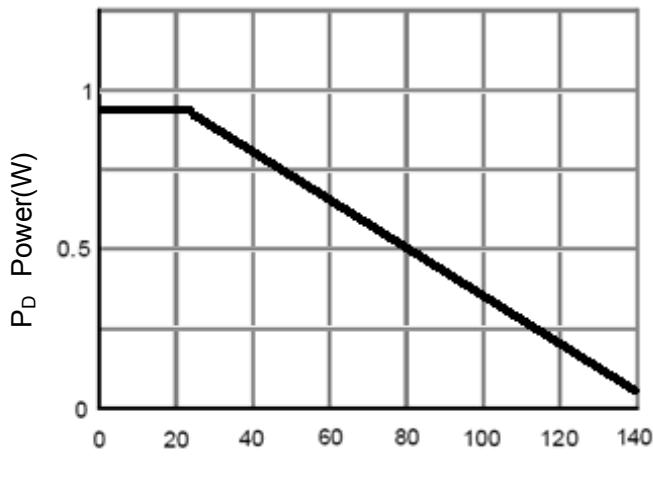
Figure 3 Power Dissipation

T_J-Junction Temperature(℃)

Figure 4 Drain Current

-Vds Drain-Source Voltage (V)
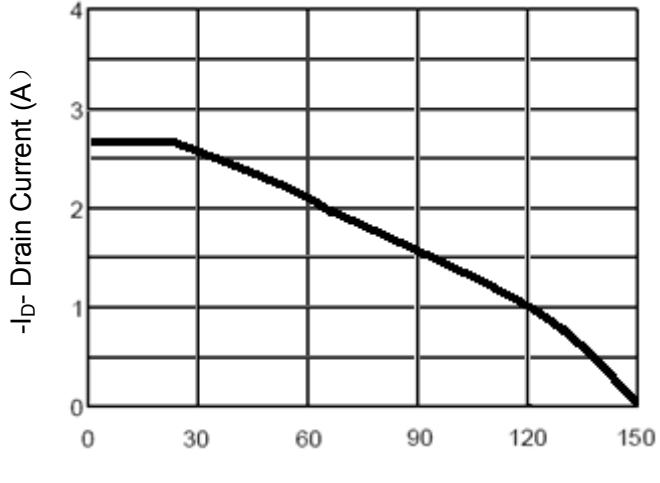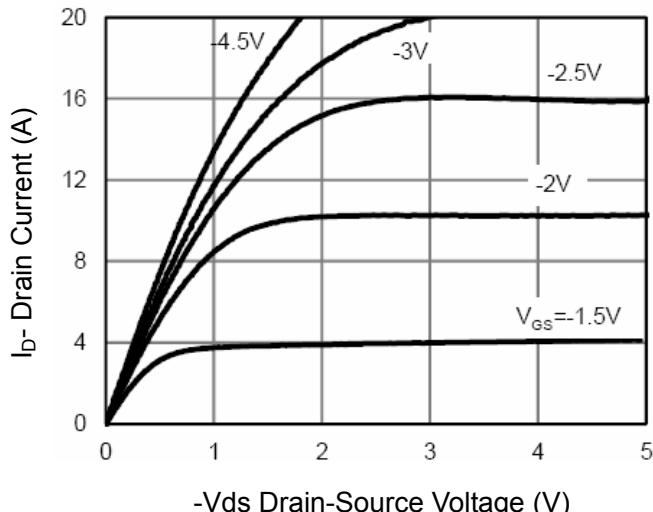
**Figure 5 Output Characteristics**

$-I_D$- Drain Current (A)
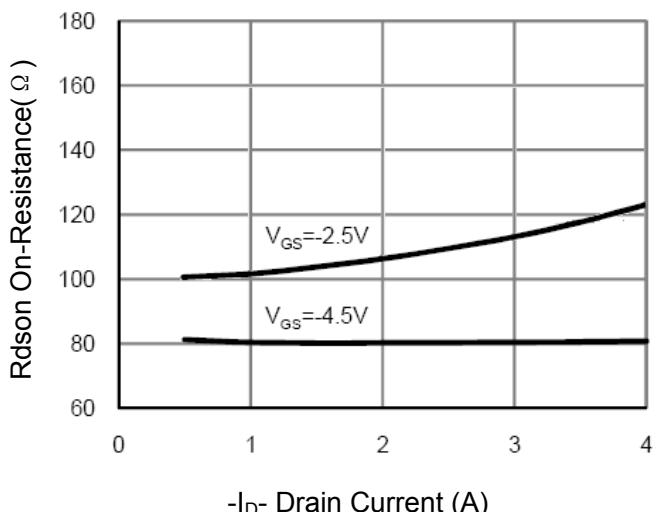
Figure 6 Drain-Source On-Resistance
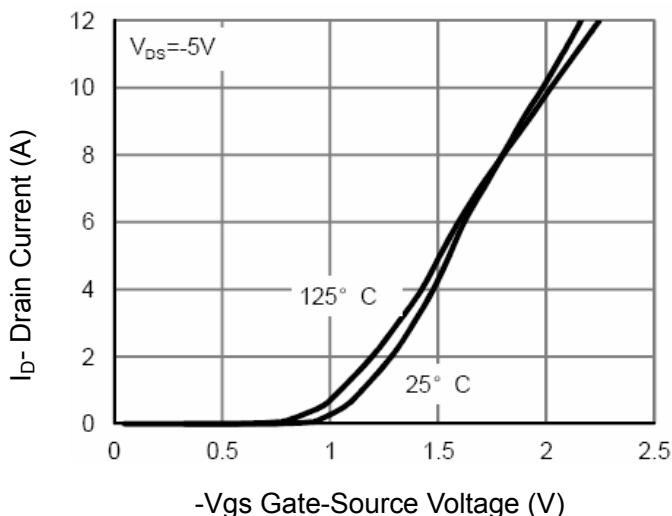
Figure 7 Transfer Characteristics
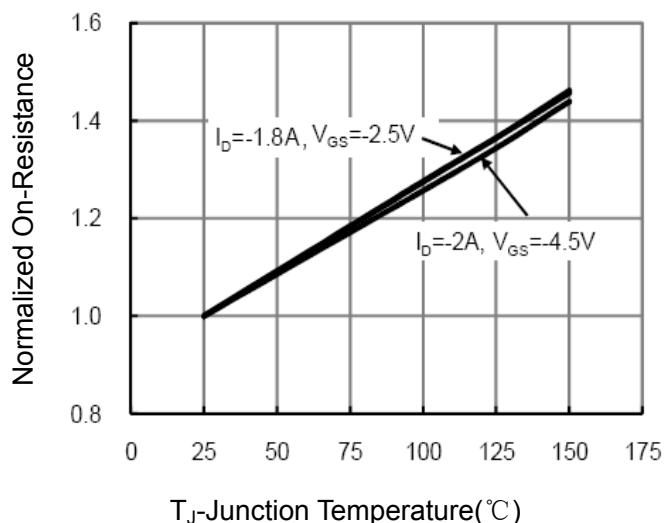
Figure 8 Drain-Source On-Resistance
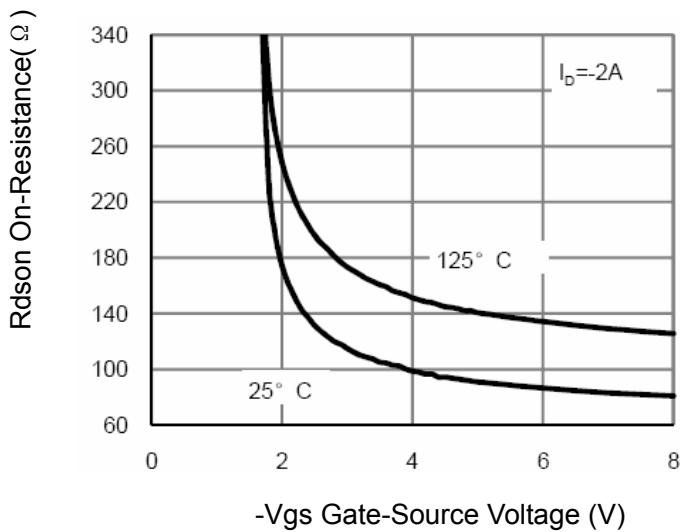
Figure 9 Rdson vs Vgs
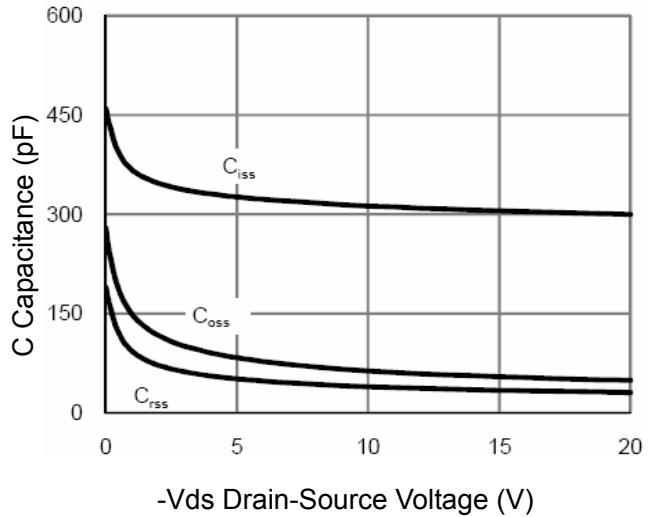
Figure 10 Capacitance vs Vds
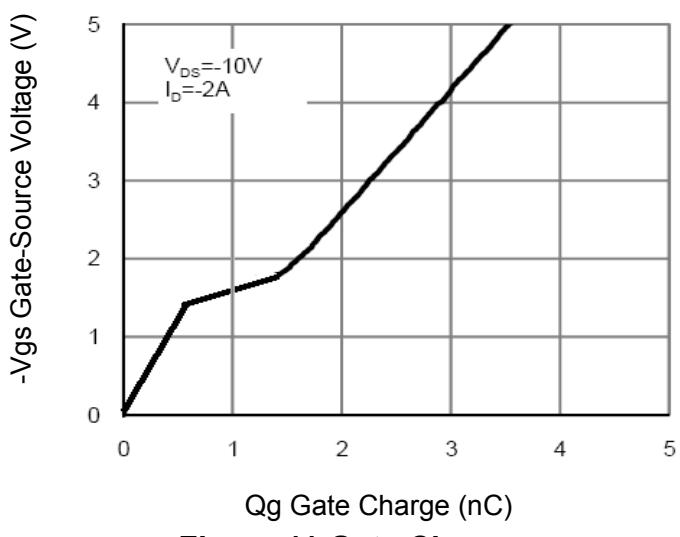
Figure 11 Gate Charge
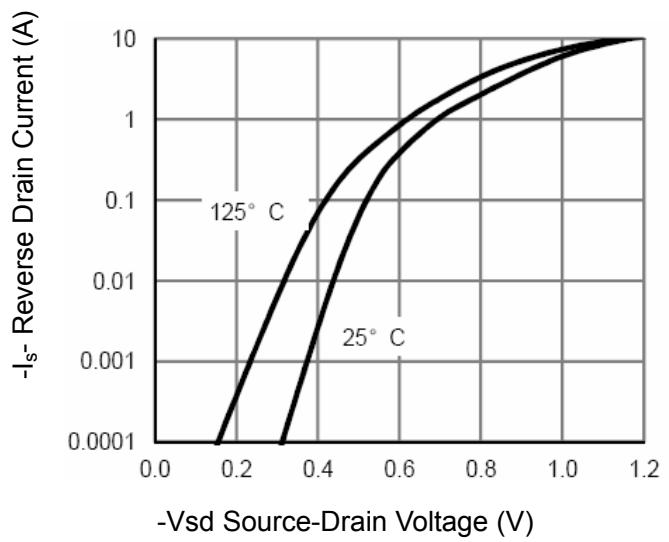
Figure 12 Source- Drain Diode Forward
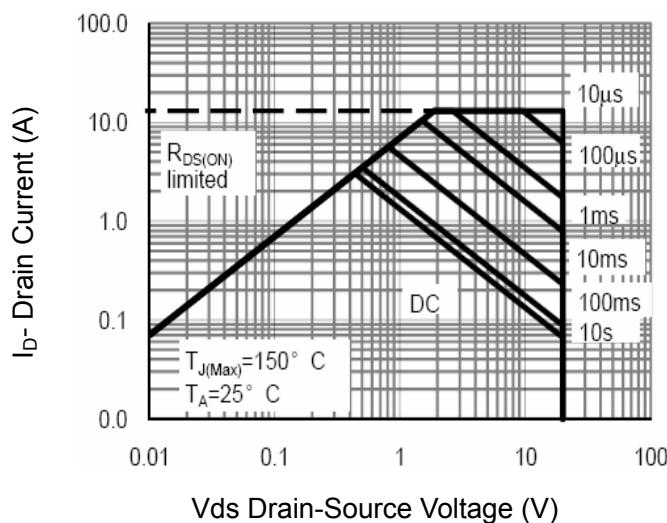
Figure 13 Safe Operation Area
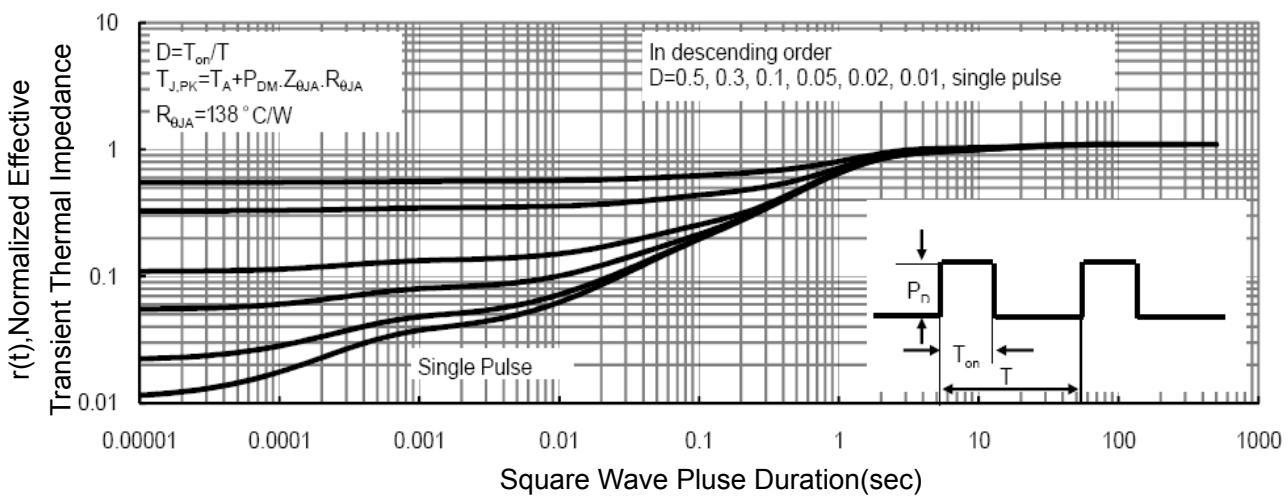

Figure 14 Normalized Maximum Transient Thermal Impedance