

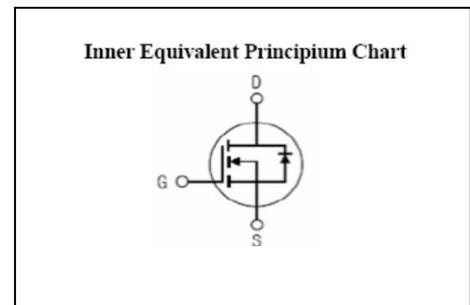
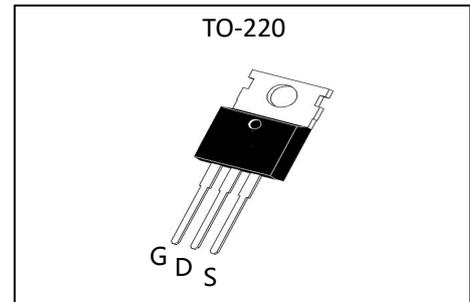
**Features**

- Fast Switching
- Low Gate Charge and  $R_{dson}$
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

**Applications**

- Power switch circuit of adaptor and charger

$V_{DSS}$	1000	V
$I_D$	4	A
$P_D (T_C=25^\circ C)$	40	W
$R_{DS(ON)type}$	4.5	$\Omega$



**Absolute** ( $T_c = 25^\circ C$  unless otherwise specified) :

Symbol	Parameter	Rating	Units
$V_{DSS}$	Drain-to-Source Voltage	1000	V
$I_D$	Continuous Drain Current	4	A
	Continuous Drain Current $T_C = 100^\circ C$	2.4	A
$I_{DM}^{a1}$	Pulsed Drain Current	16	A
$V_{GS}$	Gate-to-Source Voltage	$\pm 30$	V
$E_{AS}^{a2}$	Single Pulse Avalanche Energy	180	mJ
$E_{AR}^{a1}$	Avalanche Energy ,Repetitive	10	mJ
$I_{AR}^{a1}$	Avalanche Current	1.4	A
$dv/dt^{a3}$	Peak Diode Recovery $dv/dt$	5.0	V/ns
$P_D$	Power Dissipation	40	W
	Derating Factor above $25^\circ C$	0.32	W/ $^\circ C$
$T_J, T_{stg}$	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ C$
$T_L$	Maximum Temperature for Soldering	300	$^\circ C$

**Electrical Characteristics** (Tc= 25°C unless otherwise specified)

<b>OFF Characteristics</b>						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V <sub>DSS</sub>	Drain to Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	1000	--	--	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Bvdss Temperature Coefficient	I <sub>D</sub> =250uA, Reference 25°C	--	1.5	--	V/°C
I <sub>DSS</sub>	Drain to Source Leakage Current	V <sub>DS</sub> =1000V, V <sub>GS</sub> = 0V, T <sub>a</sub> =25°C	--	--	10	μA
		V <sub>DS</sub> =800V, V <sub>GS</sub> =0V, T <sub>a</sub> =125°C	--	--	250	
I <sub>GSS(F)</sub>	Gate to Source Forward Leakage	V <sub>GS</sub> = +30V	--	--	100	nA
I <sub>GSS(R)</sub>	Gate to Source Reverse Leakage	V <sub>GS</sub> =-30V	--	--	100	nA

<b>ON Characteristics</b>						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
R <sub>DS(ON)</sub>	Drain-to-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =2.0A	--	4.5	5.5	Ω
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0	3.0	4.0	V
Pulse width tp ≤ 380μs, δ ≤ 2%						

<b>Dynamic Characteristics</b>						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =15V, I <sub>D</sub> =2.0A	--	4.5	--	S
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V f=1.0MHz	--	850	--	pF
C <sub>oss</sub>	Output Capacitance		--	66	--	
C <sub>rss</sub>	Reverse Transfer Capacitance		--	23	--	

<b>Resistive Switching Characteristics</b>						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
t <sub>d(ON)</sub>	Turn-on Delay Time	I <sub>D</sub> =4.0A, V <sub>DD</sub> =500V V <sub>GS</sub> =10V, R <sub>G</sub> =12Ω	--	17	--	ns
t <sub>r</sub>	Rise Time		--	6	--	
t <sub>d(OFF)</sub>	Turn-Off Delay Time		--	23	--	
t <sub>f</sub>	Fall Time		--	11	--	
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =4.0A, V <sub>DD</sub> =500V V <sub>GS</sub> =10V	--	17	--	nC
Q <sub>gs</sub>	Gate to Source Charge		--	4.5	--	
Q <sub>gd</sub>	Gate to Drain ( "Miller" ) Charge		--	5.6	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$I_S$	Continuous Source Current (Body Diode)		--	--	4	A
$I_{SM}$	Maximum Pulsed Current (Body Diode)		--	--	16	A
$V_{SD}$	Diode Forward Voltage	$I_S=4.0A, V_{GS}=0V$	--	--	1.5	V
$t_{rr}$	Reverse Recovery Time	$I_S=4.0A, T_J=25^\circ C$	--	220	--	ns
$Q_{rr}$	Reverse Recovery Charge	$di_F/dt=100A/us, V_{GS}=0V$	--	0.95	--	$\mu C$
Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$						

**Thermal Characteristics**

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case	3.13	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient	62.5	$^\circ C/W$

<sup>a1</sup>: Repetitive rating; pulse width limited by maximum junction temperature

<sup>a2</sup>:  $L=10.0mH, I_D=6.0A, \text{Start } T_J=25^\circ C$

<sup>a3</sup>:  $I_{SD}=4.0A, di/dt \leq 100A/us, V_{DD} \leq BV_{DS}, \text{Start } T_J=25^\circ C$

**Test Circuits**

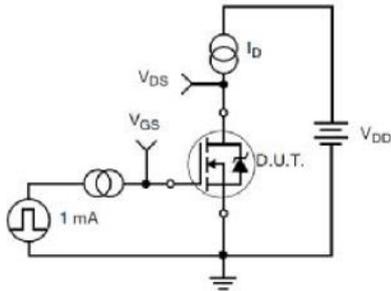


Figure 17. Gate Charge Test Circuit

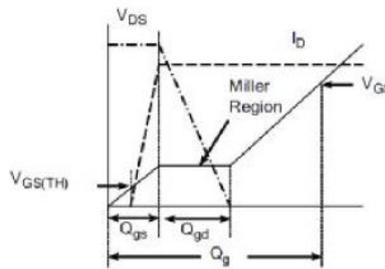


Figure 18. Gate Charge Waveform

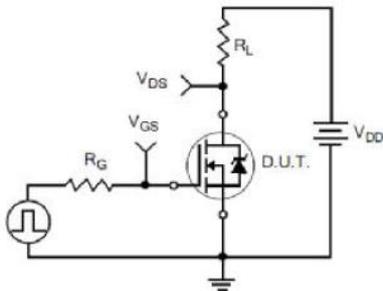


Figure 19. Resistive Switching Test Circuit

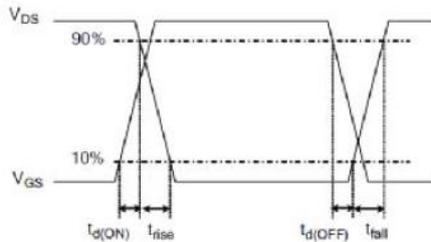


Figure 20. Resistive Switching Waveforms

Characteristics Curves

Fig. 1. Output Characteristics @ 25°C

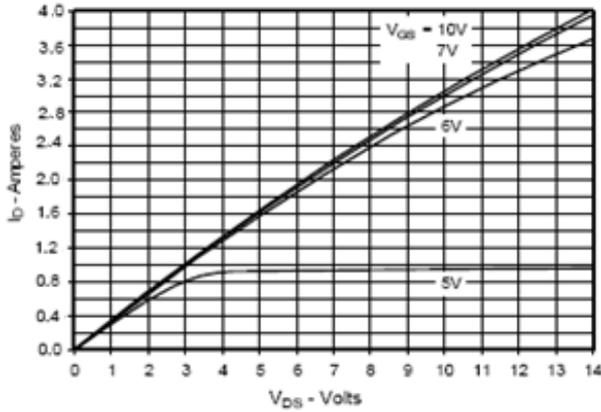


Fig. 2. Extended Output Characteristics @ 25°C

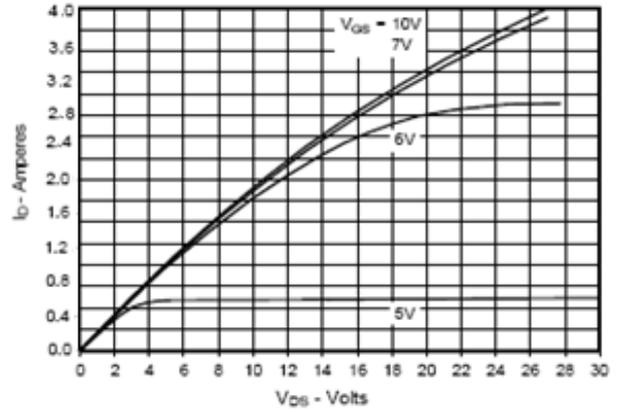


Fig. 3. Output Characteristics @ 125°C

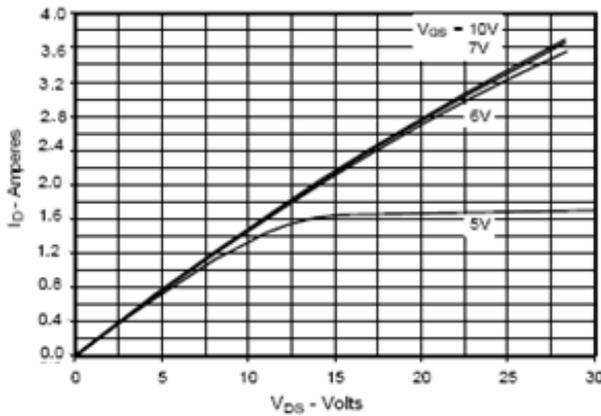


Fig. 4. RDS(on) Normalized to ID = 2A Value vs. Junction Temperature

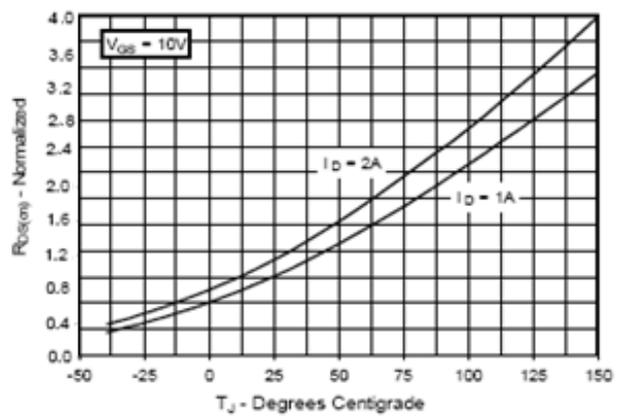


Fig. 5. RDS(on) Normalized to ID = 2A Value vs. Drain Current

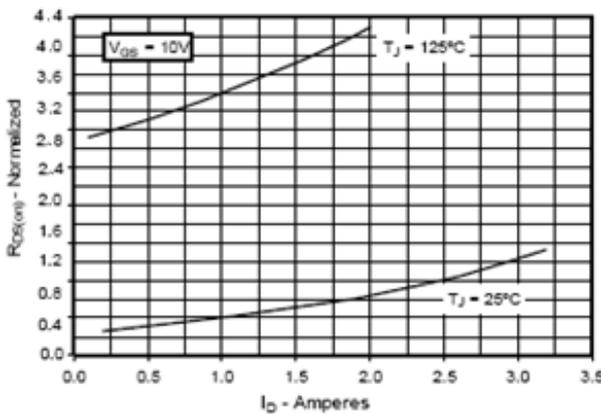


Fig. 6. Maximum Drain Current vs. Case Temperature

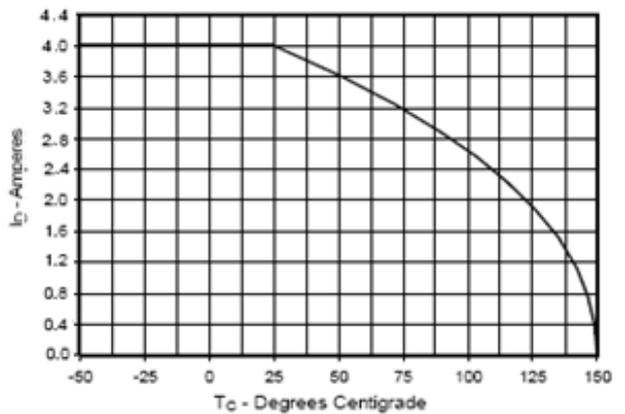


Fig. 7. Input Admittance

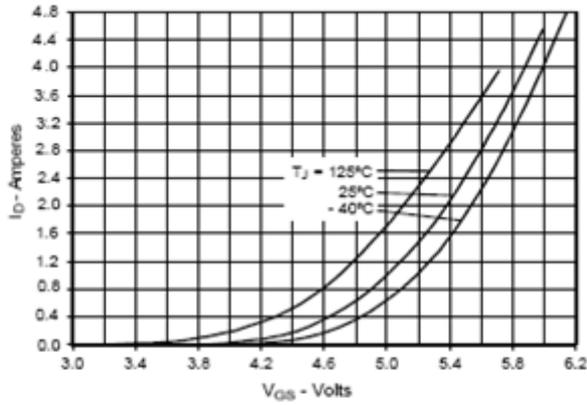


Fig. 8. Transconductance

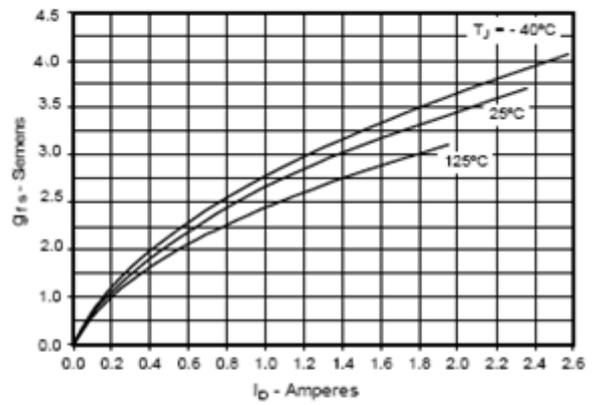


Fig. 9. Forward Voltage Drop of Intrinsic Diode

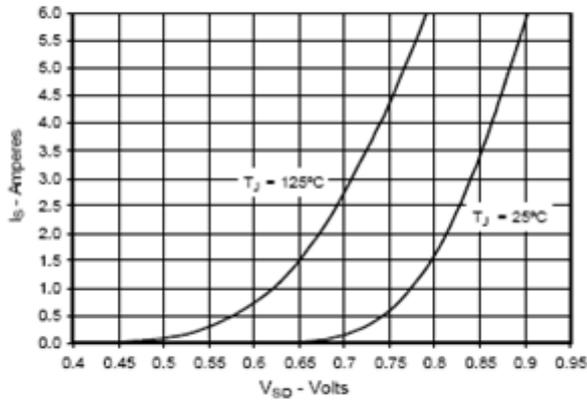


Fig. 10. Gate Charge

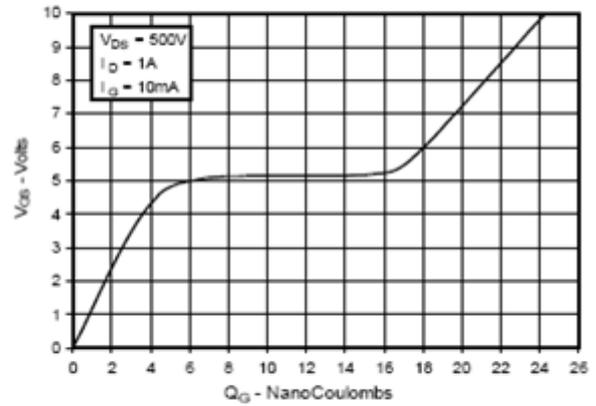


Fig. 11. Capacitance

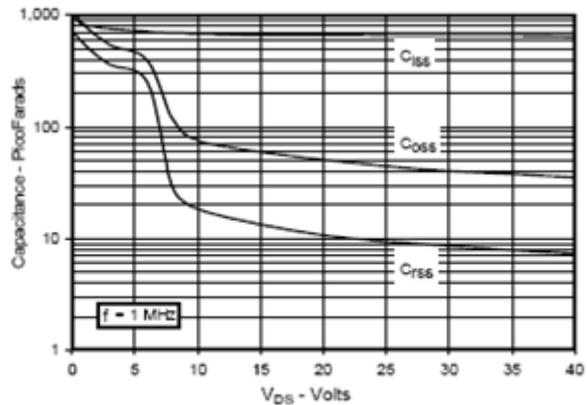
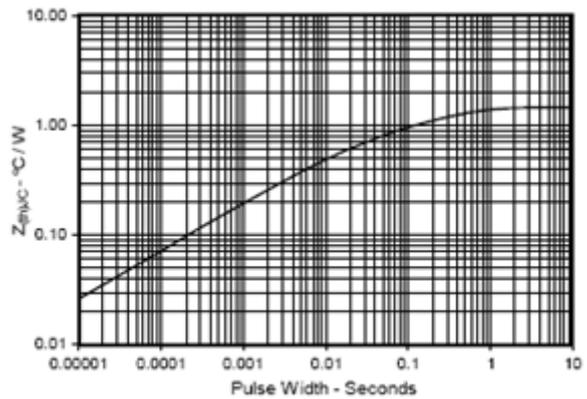


Fig. 12. Maximum Transient Thermal Impedance



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