

TS0110

N-Channel Enhancement Mode Power Mosfet

DRAWING

Features

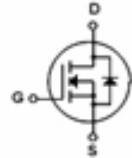
- ◆ 10A, 100V, $R_{DS(on)}=105m\Omega@V_{GS}=10V$
- ◆ High density cell design for ultra low R_{dson}
- ◆ Fully characterized Avalanche voltage and current
- ◆ Good stability and uniformity with high EAS
- ◆ Excellent package for good heat dissipation
- ◆ Special process technology for high ESD capability

General Description

- ◆ Package: TO-252A
- ◆ The 0110 uses advanced trench technology and design to Provide excellent R_{dson} with low gate charge. It can be used In a wide variety of applications.



G D S



Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DSS}	100	V
Drain Current -Continuous($T_c=25^{\circ}C$)	I_D	10	A
-Continuous($T_c=100^{\circ}C$)		6.5	A
Drain Current -Pulsed	I_{DM}	58	A
Gate-Source Voltage	V_{GSS}	± 20	V
Single pulse Avalanche Energy	E_{AS}	100	mJ
Power Dissipation ($TC=25^{\circ}C$)	P_D	25	W
Derating factor		0.24	W/ $^{\circ}C$
Operating and Storage Temperature Range	T_j T_{stg}	-55 to +150	$^{\circ}C$

Thermal Characteristics

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.17	$^{\circ}C/W$

Electrical Characteristics($T_c=25^{\circ}C$ unless otherwise noted)

Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	110	—	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$	—	—	1	μA
I_{GSS}	Gate-Body Leakage	$V_{GS}=\pm 20V, V_{DS}=0V$	—	—	± 100	nA

On Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{GTH}	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.5	1.9	2.4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=6A$	—	105	135	m Ω
		$V_{GS}=4.5V, I_D=3A$		110	140	
G_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=6A$	—	10		S

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	—	690	—	pF
C_{oss}	Output Capacitance		—	120	—	
C_{rss}	Reverse Transfer Capacitance		—	90	—	

Switching Characteristics

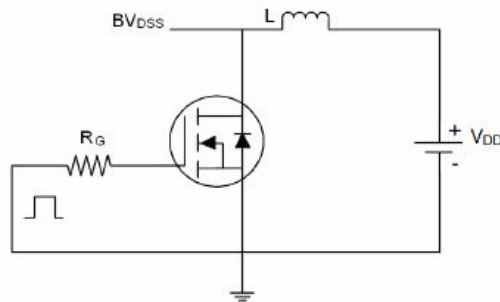
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
t_{don}	Turn-On Delay Time	$V_{DD}=30V, I_D=2A, R_L=15\Omega$ $V_{GS}=10V, R_G=2.5\Omega$	—	11	—	ns
t_r	Turn-On Rise Time		—	7.4	—	ns
t_{doff}	Turn-Off Delay Time		—	35	—	ns
t_f	Turn-Off Fall Time		—	9.1	—	ns
Q_g	Total Gate Charge	$V_{DS}=30V$	—	15.5	—	nc
Q_{gs}	Gate-Source Charge	$I_D=3A$	—	3.2	—	nc
Q_{gd}	Gate-Drain Charge	$V_{GS}=10V$	—	4.7	—	nc

Drain-Source Diode Characteristics and Maximum Ratings

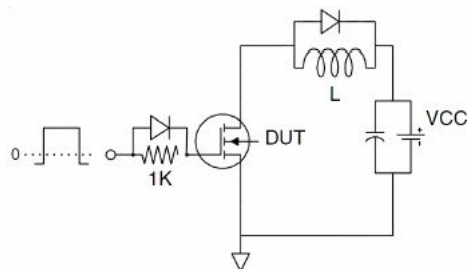
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
I_S	Maximum Continuous Drain-source diode forward current		—	—	10	A
V_{sd}	Drain-source diode forward Voltage	$V_{GS}=0V, I_S=9.0A$	—	—	1.2	V
T_{rr}	Reverse Recovery Time	$T_J=25^\circ C, I_F=6.0A$	—	21	—	ns
Q_{rr}	Reverse Recovery charge	$di/dt=100A/\mu s$	—	97	—	nc
t_{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible(Turn-on is dominated by LS+LD)				

Test circuits

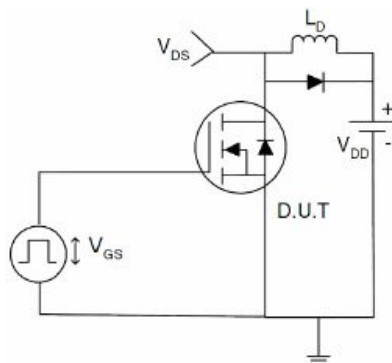
1)EAS Test Circuits



2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Typical Electrical And Thermal Characteristics(Curves)

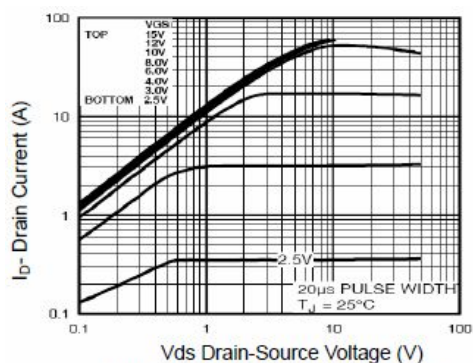


Figure 1 Output Characteristics

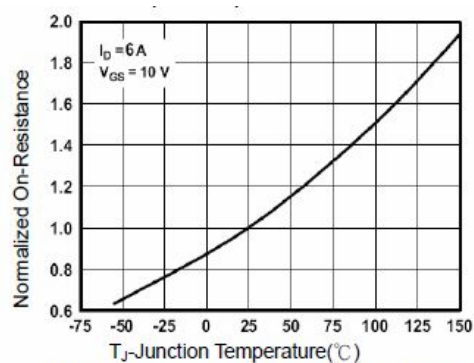


Figure 4 Rdson-Junction Temperature

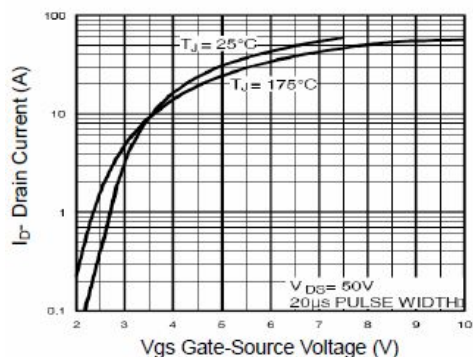


Figure 2 Transfer Characteristics

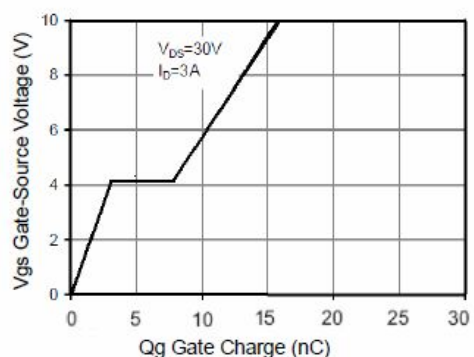


Figure 5 Gate Charge

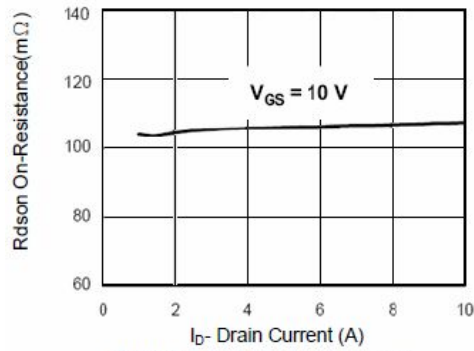


Figure 3 Rdson- Drain Current

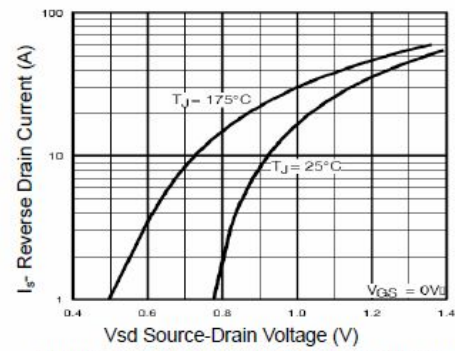


Figure 6 Source- Drain Diode Forward

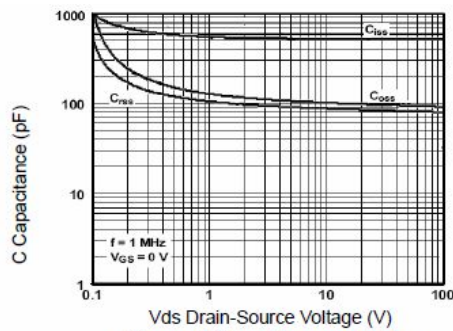


Figure 7 Capacitance vs Vds

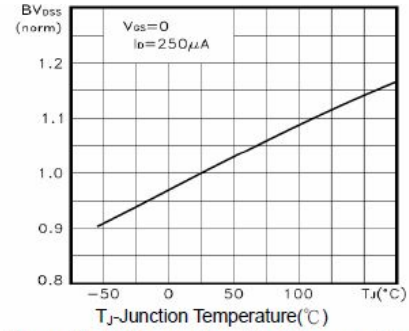


Figure 9 BV_{DSS} vs Junction Temperature

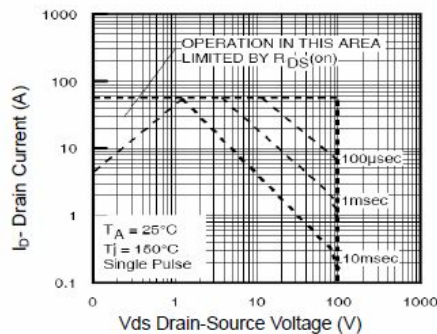


Figure 8 Safe Operation Area

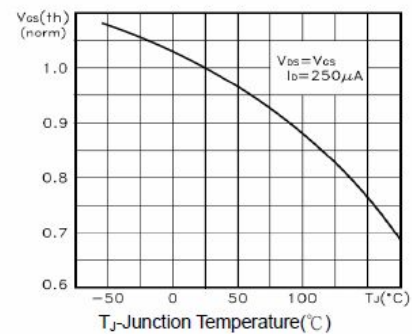


Figure 10 $V_{GS(th)}$ vs Junction Temperature

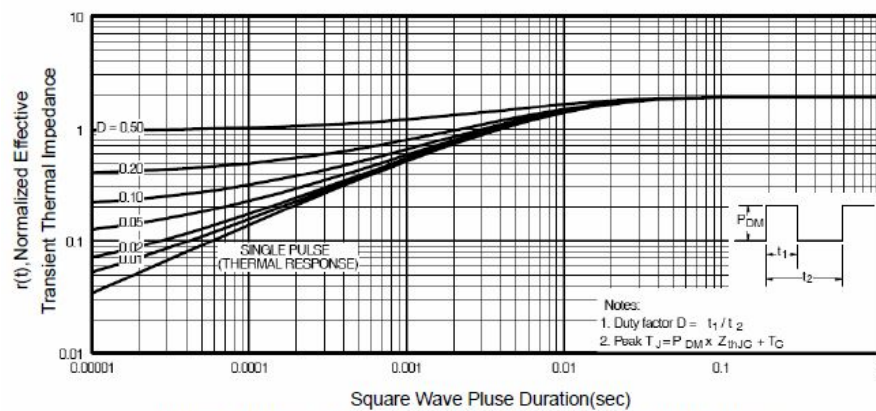


Figure 11 Normalized Maximum Transient Thermal Impedance

Mechanical Dimensions

