

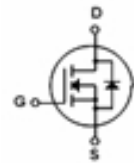
0110

N-Channel Enhancement Mode Power Mosfet

DRAWING



G D S



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-92
- ◆ 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.

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	3	W
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	$R_{\theta JC}$	41.7	$^\circ C/W$

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 _{GSTH}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.5	1.9	2.4	V
R _{DSON}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =6A	—	105	135	mΩ
		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

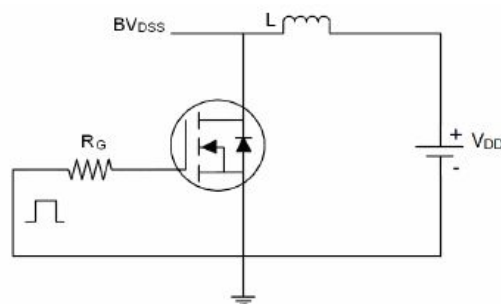
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
t _{don}	Turn-On Delay Time	V _{DD} =30V I _D =2A R _L =15Ω V _{GS} =10V, R _G =2.5Ω	—	11	—	ns
t _r	Turn-On Rise Time		—	7.4	—	ns
t _{doff}	Turn-Off Delay Time		—	35	—	ns
t _f	Turn-Off Fall Time		—	9.1	—	ns
Q _g	Total Gate Charge	V _{DS} =30V	—	15.5	—	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

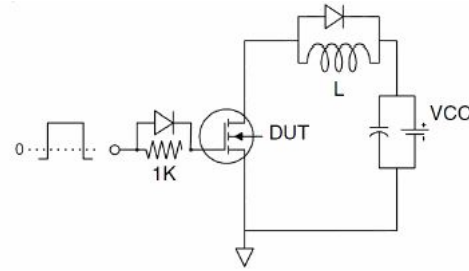
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
I _s	Maximum Continuous Drain-source diode forward current		—	—	10	A
V _{sd}	Drain-source diode forward Voltage	V _{GS} =0V, I _S =9.0A	—	—	1.2	V
T _{rr}	Reverse Recovery Time	T _J =25℃, I _F =6.0A	—	21	—	ns
Q _{rr}	Reverse Recovery charge	di/dt=100A/μs	—	97	—	nc
t _{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible(Turn-on is dominated by LS+LD)				

Test circuits

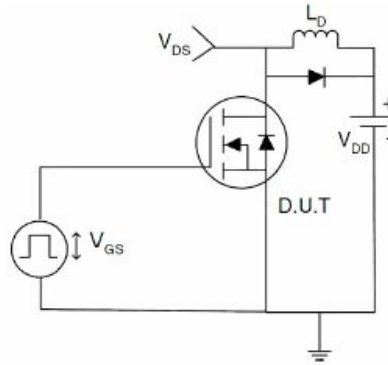
1)EAS Test Circuits



2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Typical Electrical And Thermal Characteristics(Curves)

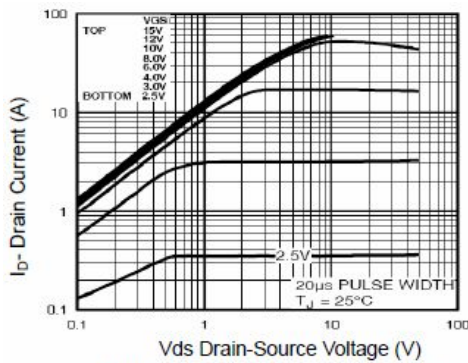


Figure 1 Output Characteristics

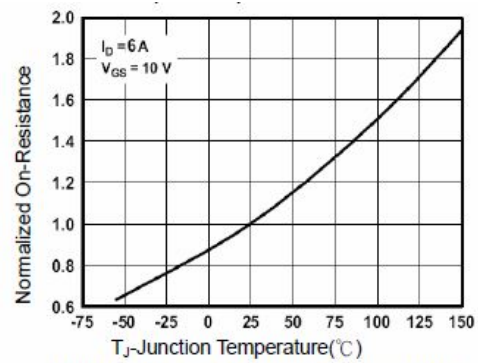


Figure 4 Rds(on)-Junction Temperature

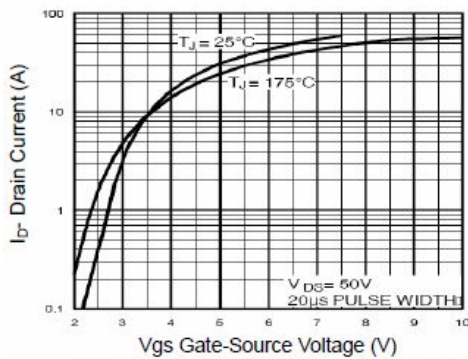


Figure 2 Transfer Characteristics

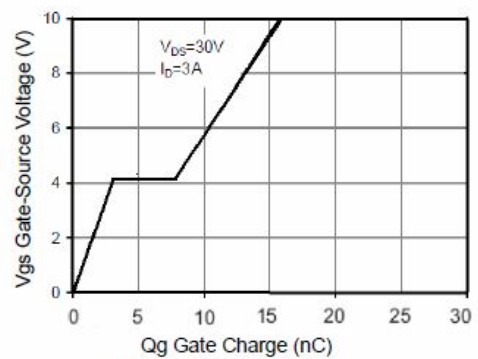


Figure 5 Gate Charge

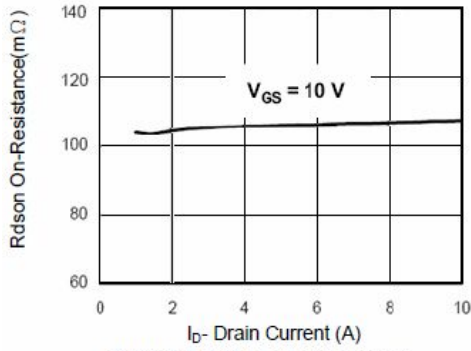


Figure 3 Rdson- Drain Current

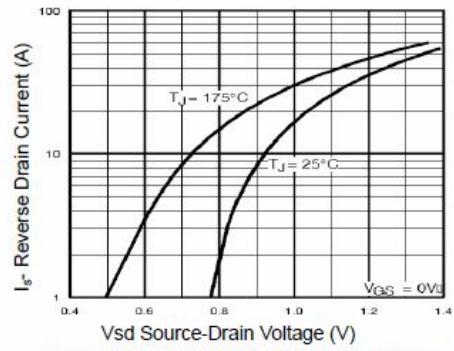


Figure 6 Source- Drain Diode Forward

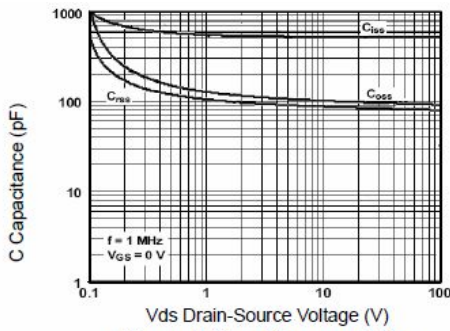


Figure 7 Capacitance vs Vds

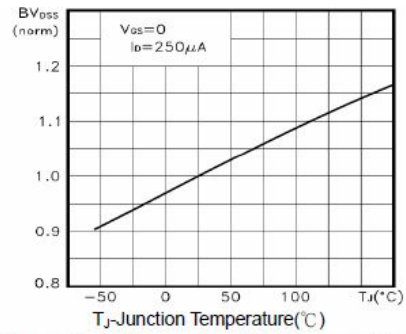


Figure 9 BV_{DSS} vs Junction Temperature

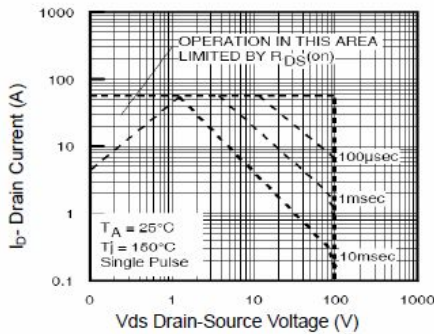


Figure 8 Safe Operation Area

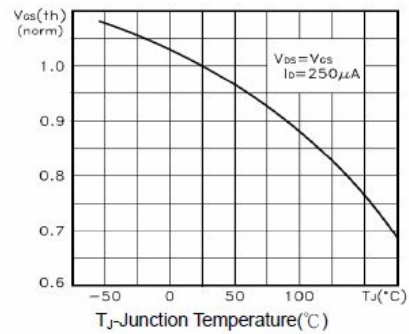


Figure 10 V_{GS(th)} vs Junction Temperature

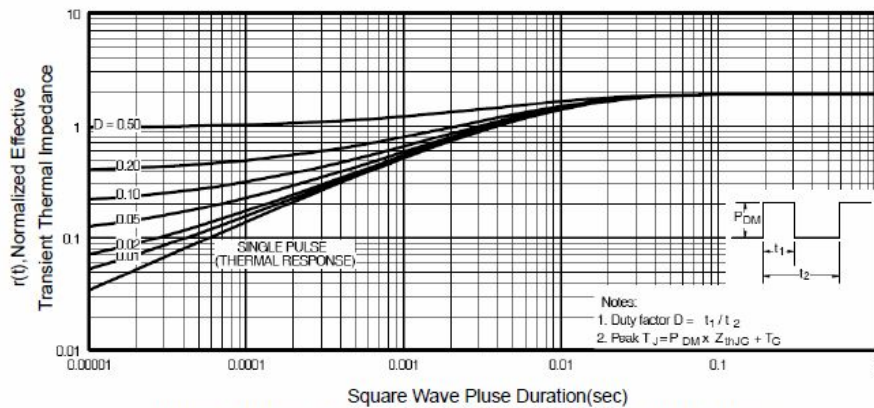
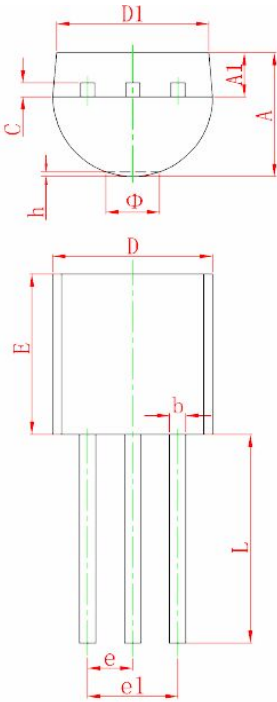


Figure 11 Normalized Maximum Transient Thermal Impedance

Mechanical Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.400	4.700	0.173	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015