UDS80P06

P-Ch 60V Fast Switching MOSFETs

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Product Summary

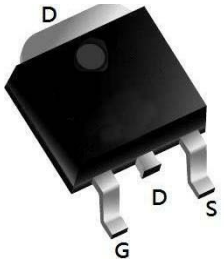
Green

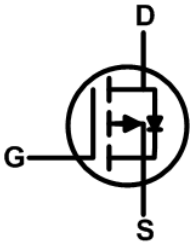
BVDSS	RDSON	ID
-60V	9.0mΩ	-80A

Applications

- Battery switching application
- Hard switched and high frequency circuits
- Power management

TO252 Pin Configuration





Absolute Maximum Ratings (T_j = 25℃ unless otherwise specified):

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		-60	V
I_D	Continuous Drain Current	T_C = 25 °C	-80	A
	Continuous Drain Current	T_C = 100 °C	-50	A
I_{DM}[a1]	Pulsed Drain Current		-320	A
V_{GS}	Gate-to-Source Voltage		±20	V
P_D	Power Dissipation		110	W
E_{AS} [a2]	Single pulse avalanche energy		450	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		150, −55 to 150	℃
T_L	Maximum Temperature for Soldering		300	℃

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.1	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	60	℃/W

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-60	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS} = -60V, V_{GS}= 0V	--	--	1	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =-20V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =+20V	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-1.3	-1.8	-2.3	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	V_{GS}=-10V, I_D=-20A	--	9.0	11.0	mΩ
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	V_{GS}=-4.5V, I_D=-15A	--	12.0	16.0	mΩ
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-20A	50	--	--	S

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS}=0V	--	3060	--	pF
C_{oss}	Output Capacitance	V_{DS}=-30V	--	620	--	
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	--	20	--	
R_g	Gate resistance	V_{GS}=0V, V_{DS} Open	--	2.0	--	Ω

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=-20A, R_L=0.75Ω	--	4.5	--	ns
tr	Rise Time	V_{DS}= -30V	--	2.5	--	
$t_{d(OFF)}$	Turn-Off Delay Time	V_{GS}= -10V	--	14.5	--	
t_f	Fall Time	R_G= 3Ω	--	3.5	--	
Q_g	Total Gate Charge	V_{GS}=-10V	--	56	--	nC
Q_{gs}	Gate Source Charge	V_{DS}=-30V	--	11	--	
Q_{gd}	Gate Drain Charge	I_D=-20A	--	9	--	

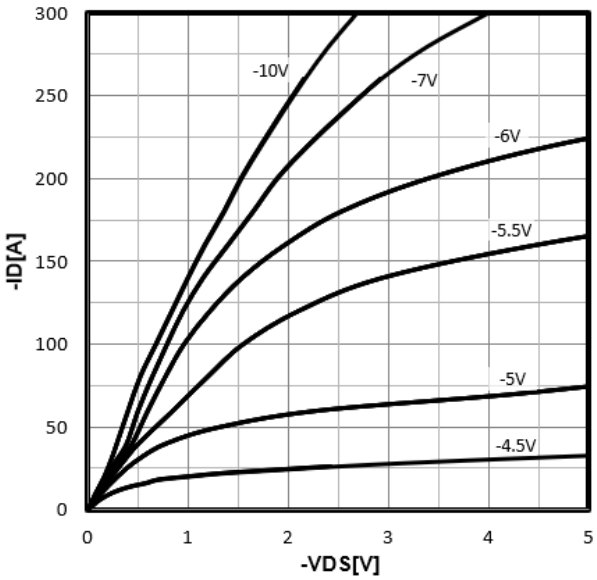
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C=25 °C	--	--	-80	A
I_{SM}	Diode Pulse Current		--	--	-320	A
V_{SD}	Diode Forward Voltage	I_S=-6.0A, V_{GS}=0V	--	--	-1.2	V
t_{rr}	Reverse Recovery time	I_S=-20A, V_{DD}=-30V	--	60	--	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	--	105	--	nC

[a1]: Repetitive rating; pulse width limited by maximum junction temperature
[a2]: V_{DD} =30V, L=0.3mH, R_G =25Ω, Starting T_j=25℃

Characteristics Curve:

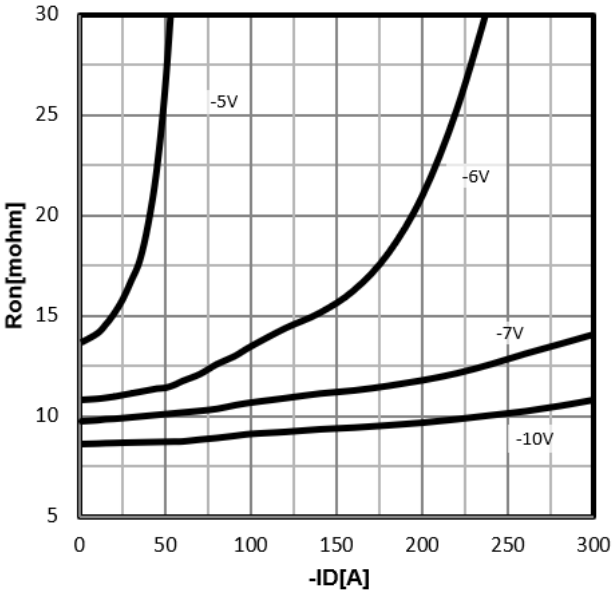
Typ. output characteristics

$I_D=f(V_{DS})$



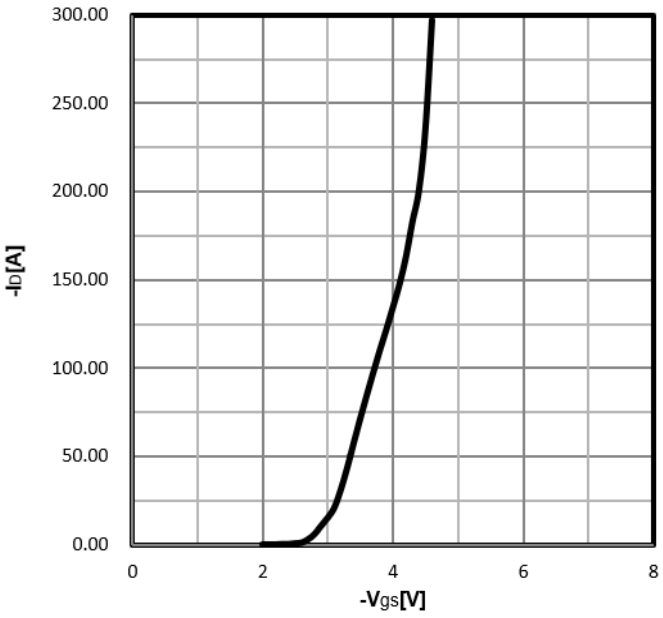
Typ. drain-source on resistance

$R_{DS(on)}=f(I_D)$



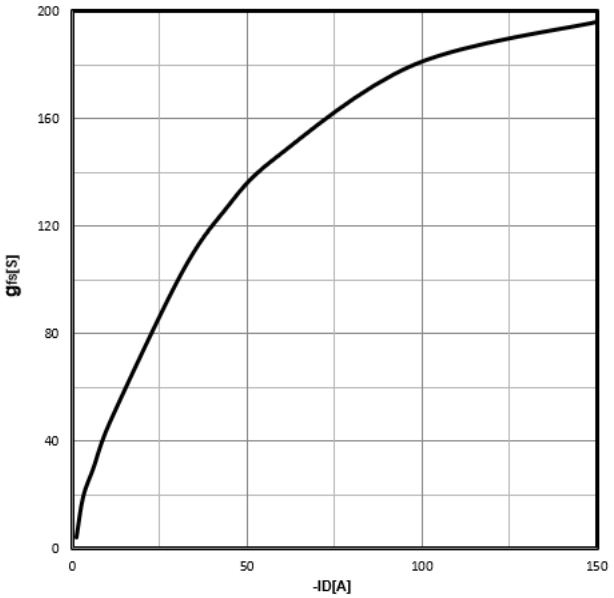
Typ. transfer characteristics

$I_D=f(V_{GS})$



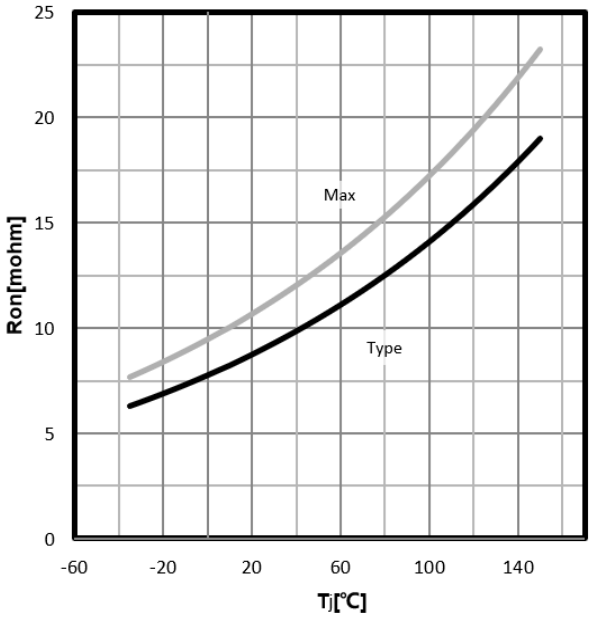
Typ. forward transconductance

$g_{fs}=f(I_D)$



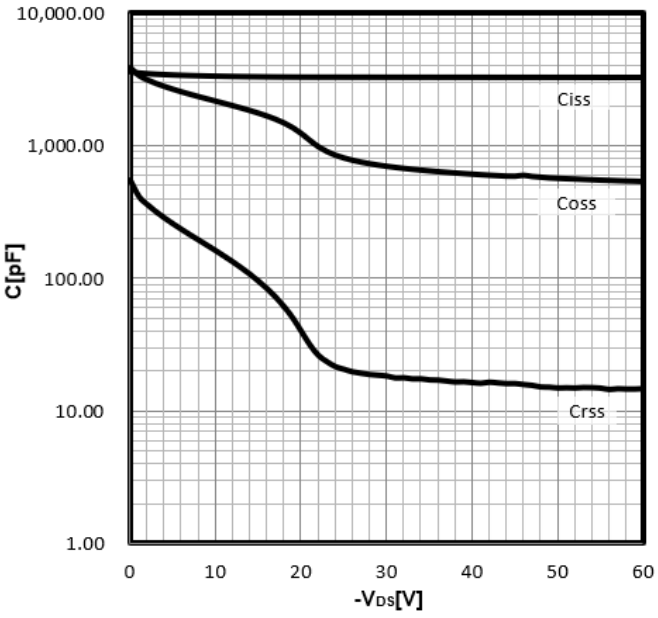
Drain-source on-state resistance

$R_{DS(on)}=f(T_j)$; I_D=-20A; V_{GS}=-10V



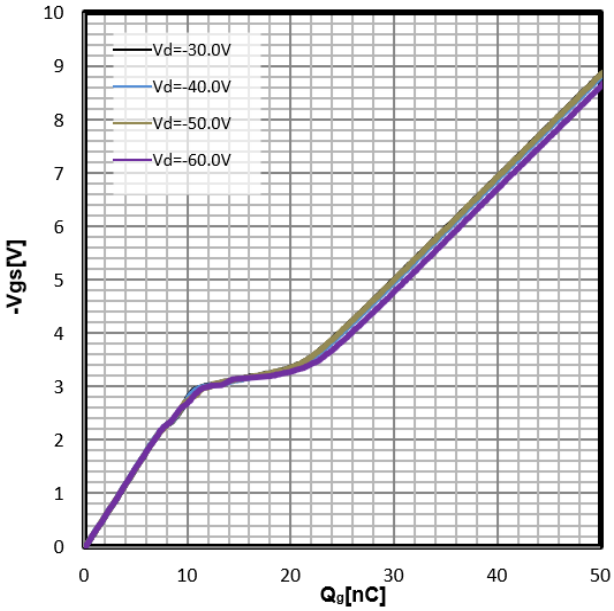
Typ. capacitances

$C=f(V_{DS})$; V_{GS}=0V; f =1MHz



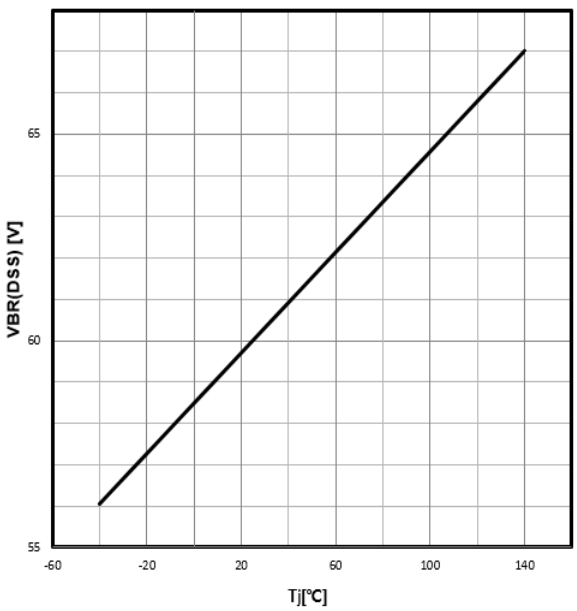
Typ. gate charge

$V_{GS}=f(Q_{gate})$; I_D=-20A



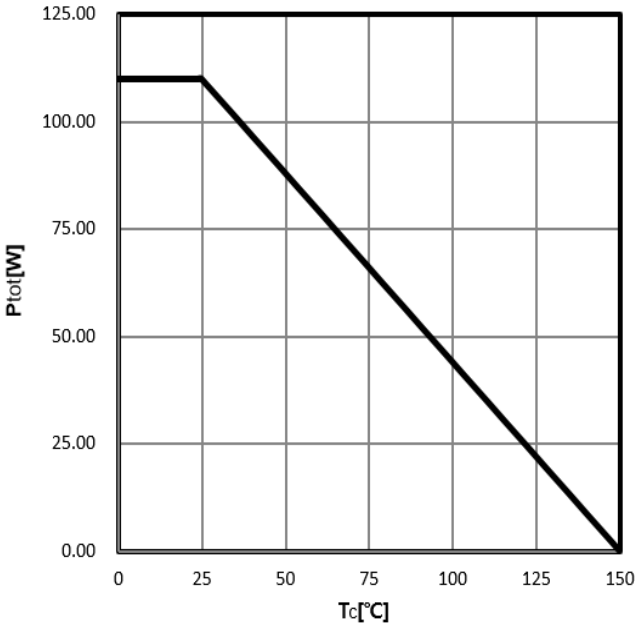
Drain-source breakdown voltage

$V_{BR(DSS)}=f(T_j)$; I_D=-250uA

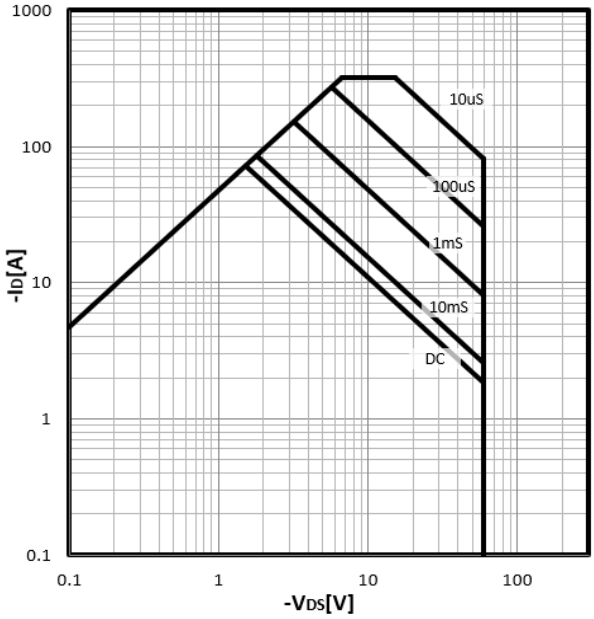


Power Dissipation

$P_{tot}=f(T_C)$

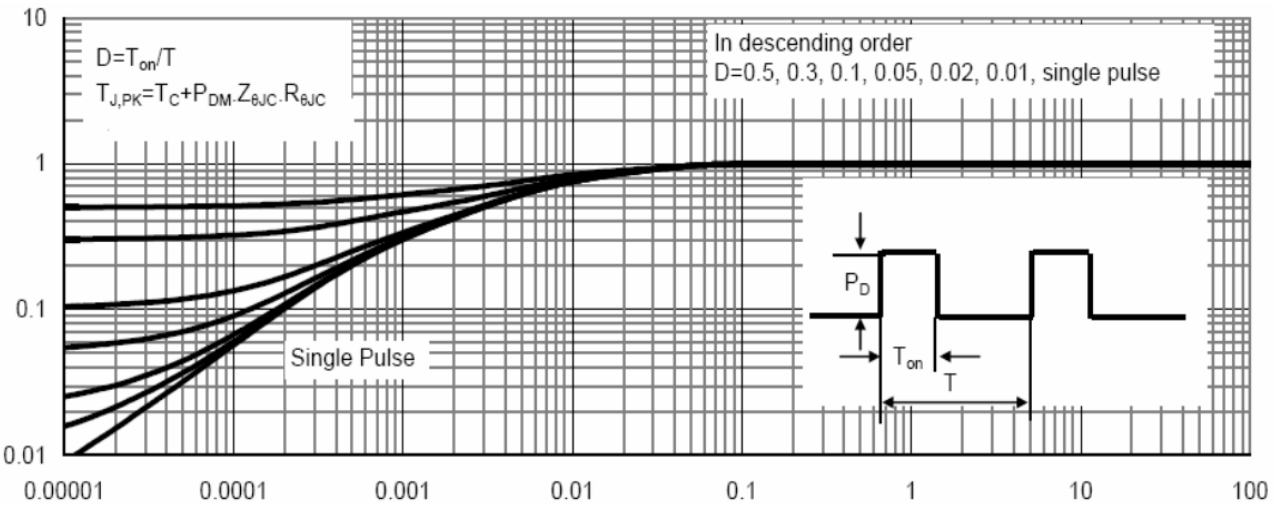


$I_D=f(V_{DS})$

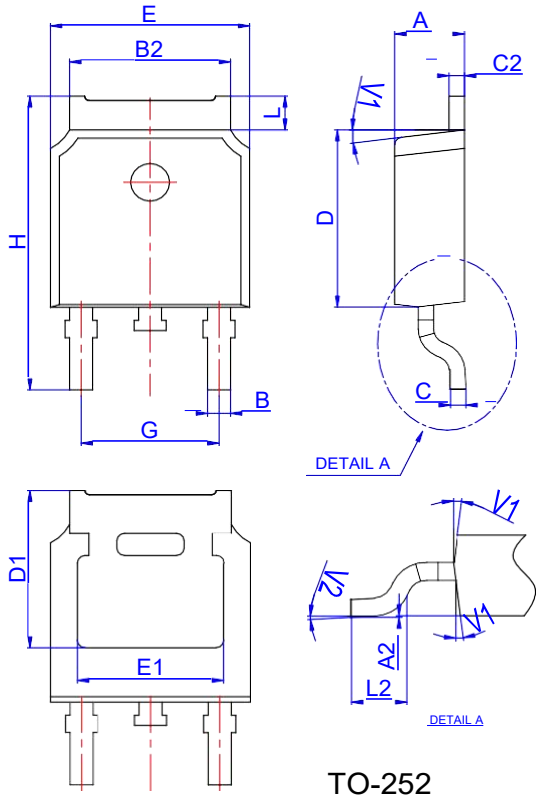


Max. transient thermal impedance

$Z_{thJC}=f(t_p)$



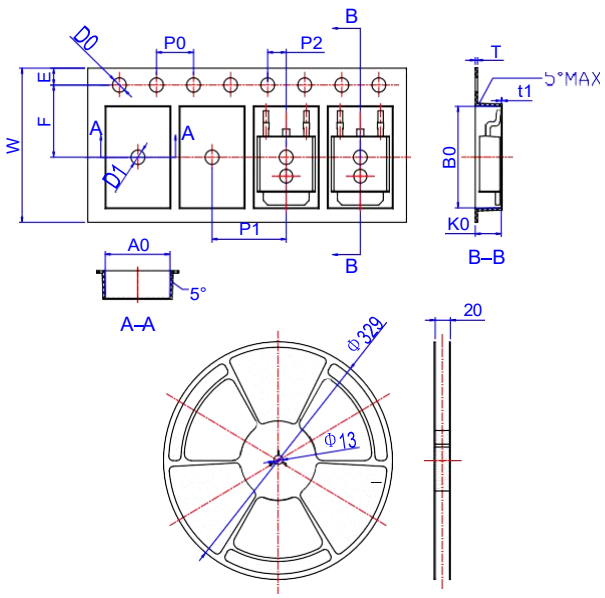
Package Mechanical Data-TO-252



TO-252

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252-4R



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583