

Features

- $V_{DS} = -40V$ $I_D = -50A$
- $R_{DS(ON)} < -10m\Omega$ @ $V_{GS} = -10V$ (Type: 7.0m Ω)

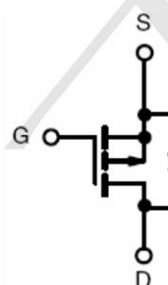
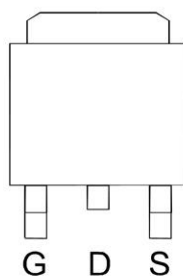
Application

- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

Package and Pin Configuration

(TO-252-3L)

Top View



Marking:



Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-50	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-56	A
I_{DM}	Pulsed Drain Current ²	-280	A
EAS	Single Pulse Avalanche Energy ³	500	mJ
I_{AS}	Avalanche Current	-50	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ⁴	52.1	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	2.4	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-40		---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=-1mA$	---	-0.023	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V, I_D=-12A$	---	7.0	10	m Ω
		$V_{GS}=-4.5V, I_D=-12A$	---	9.0	15	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.8	-2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-40V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=-40V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=-15V, I_D=-12A$	---	20	---	S
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	---	7	14	Ω
Q_g	Total Gate Charge (-4.5V)	$V_{DS}=-20V, V_{GS}=-10V, I_D=-12A$	---	27.9	---	nC
Q_{gs}	Gate-Source Charge		---	7.7	---	
Q_{gd}	Gate-Drain Charge		---	7.5	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-20V, V_{GS}=-10V, R_G=3.0\Omega, I_D=-12A$	---	40	---	ns
T_r	Rise Time		---	35.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	100	---	
T_f	Fall Time		---	9.6	---	
C_{iss}	Input Capacitance	$V_{DS}=-20V, V_{GS}=0V, f=1MHz$	---	6500	---	pF
C_{oss}	Output Capacitance		---	790	---	
C_{rss}	Reverse Transfer Capacitance		---	605	---	
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	-50	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1.2	V

Typical Characteristics

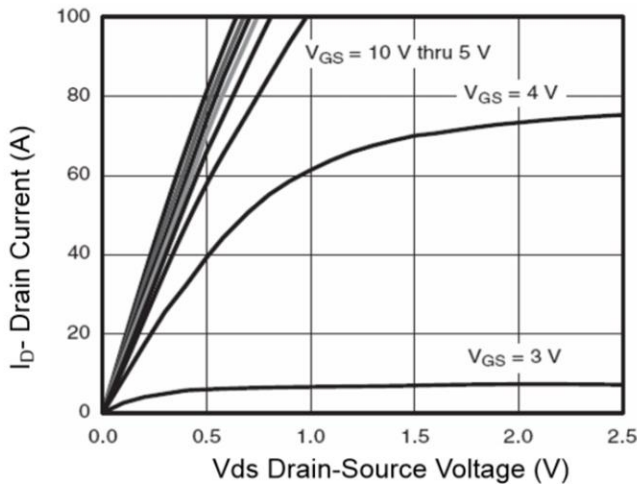


Figure 1 Output Characteristics

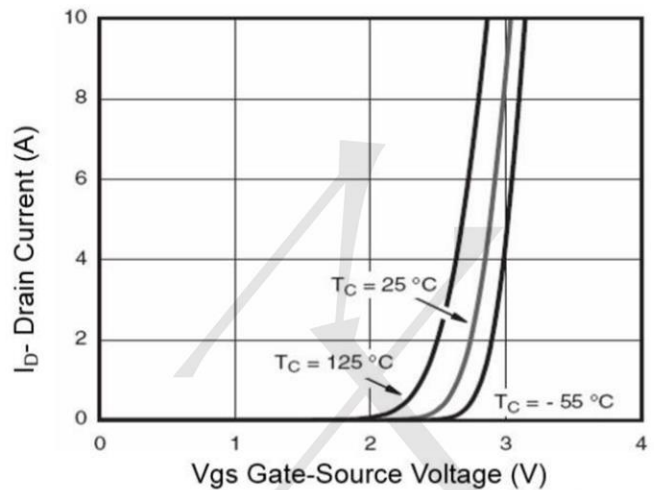


Figure 2 Transfer Characteristics

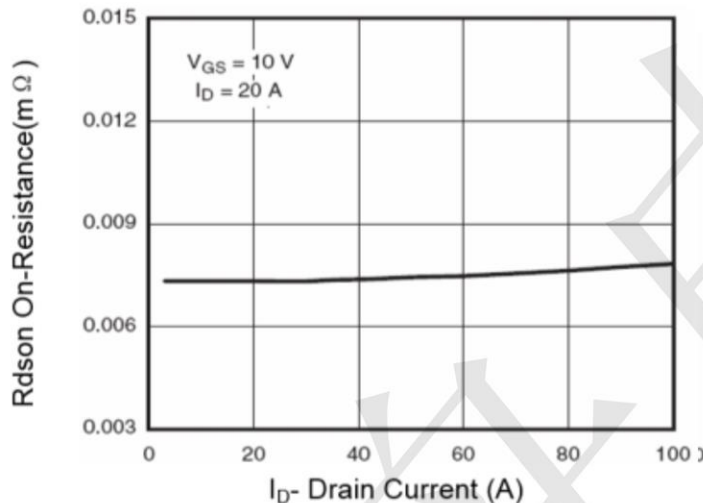


Figure 3 Rdson- Drain Current

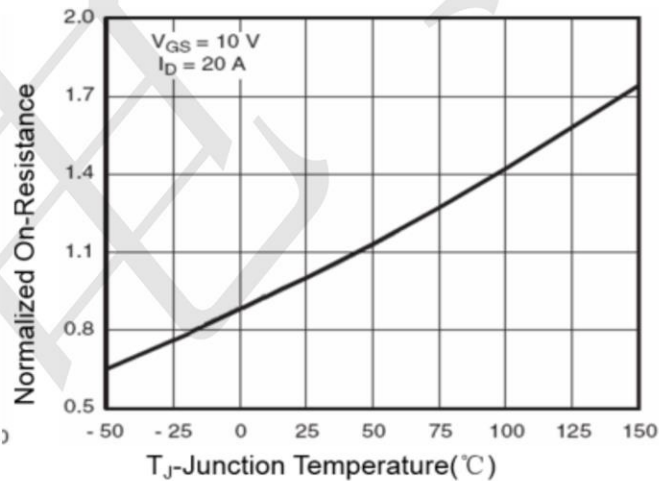


Figure 4 Rdson-Junction Temperature

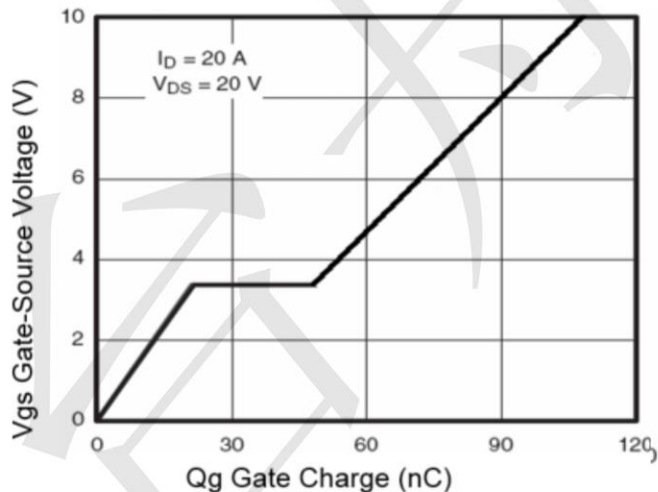


Figure 5 Gate Charge

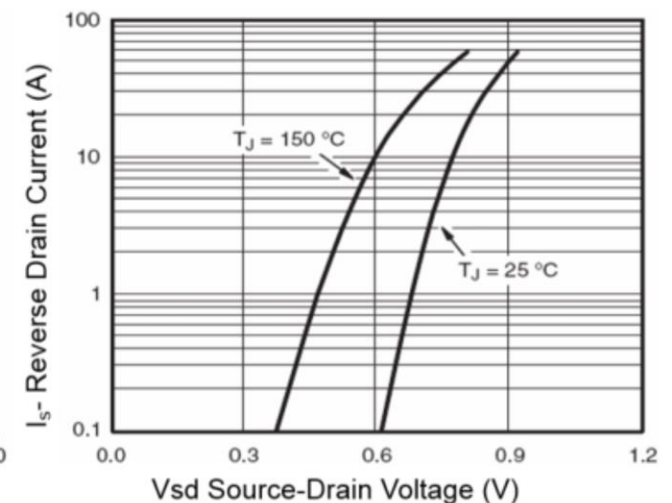


Figure 6 Source- Drain Diode Forward

Typical Characteristics

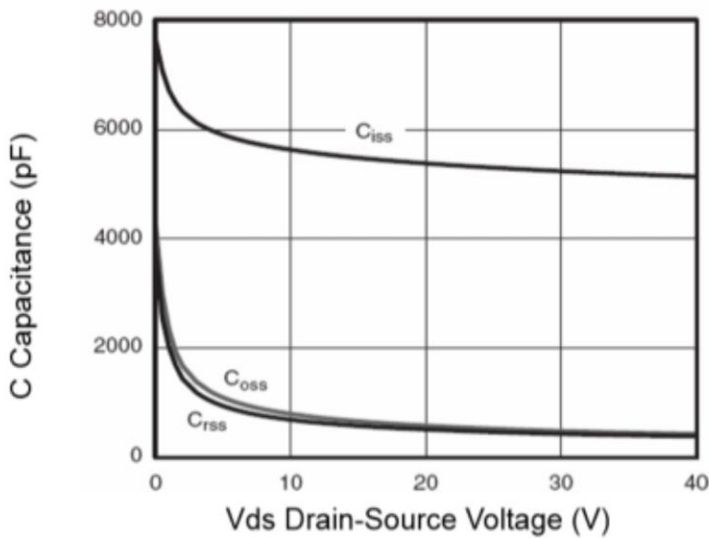


Figure 7 Capacitance vs Vds

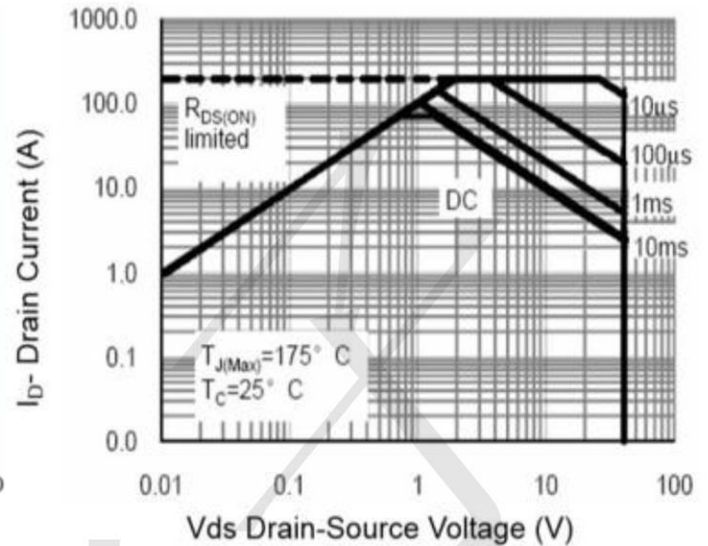


Figure 8 Safe Operation Area

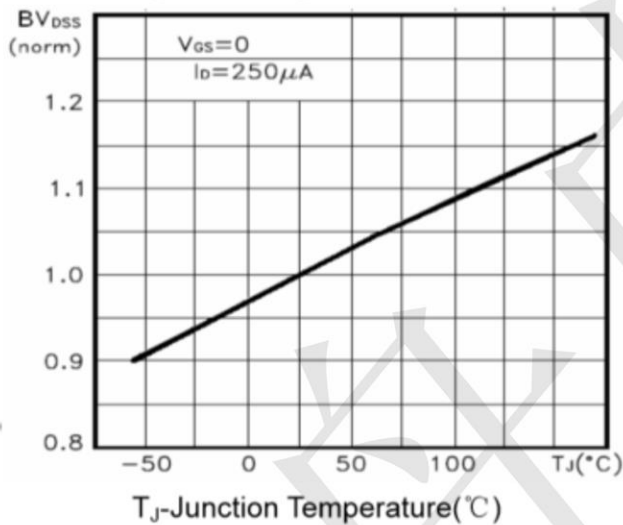


Figure 9 BV_{DSS} vs Junction Temperature

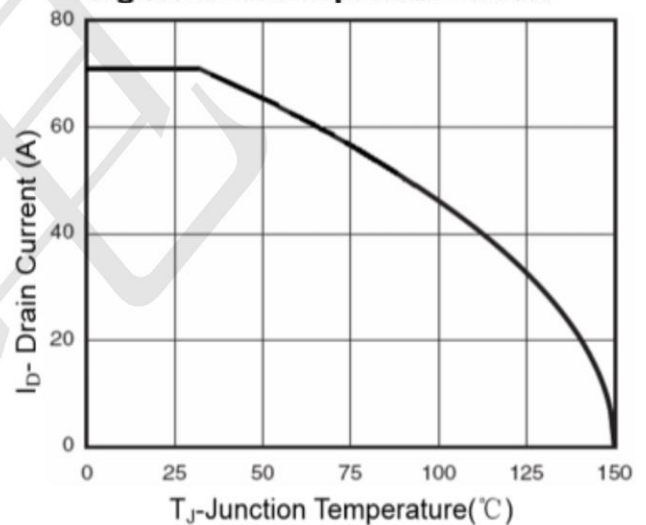


Figure 10 I_D Current Derating vs Junction Temperature

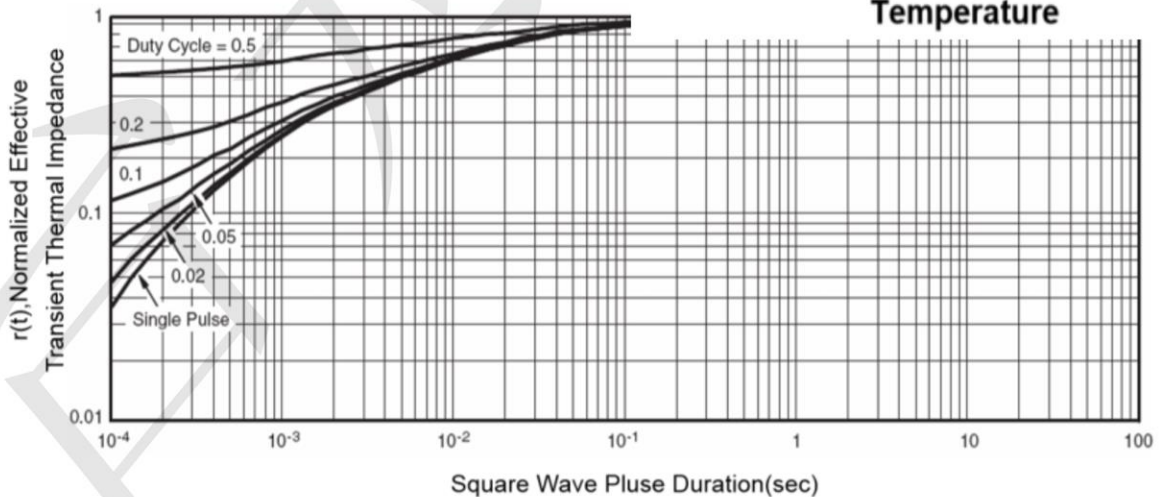
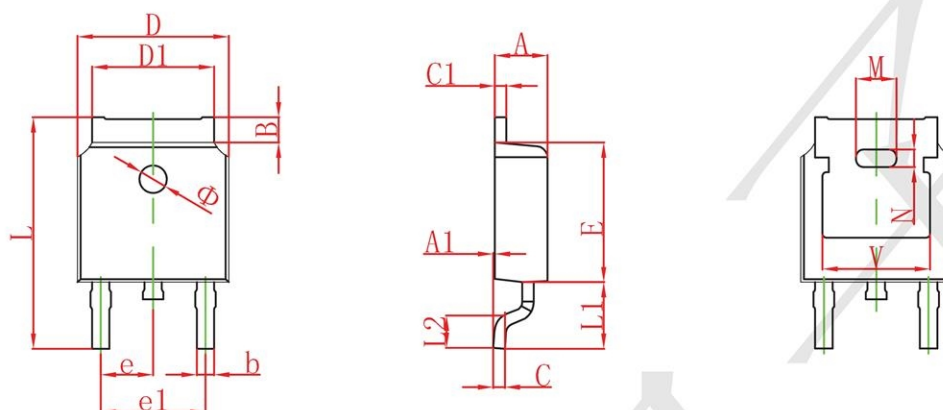


Figure 11 Normalized Maximum Transient Thermal Impedance

TO252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
B	0.800	1.400	0.031	0.055
b	0.710	0.810	0.028	0.032
c	0.460	0.560	0.018	0.022
c1	0.460	0.560	0.018	0.022
D	6.500	6.700	0.256	0.264
D1	5.130	5.460	0.202	0.215
E	6.000	6.200	0.236	0.244
e	2.286 TYP.		0.090 TYP.	
e1	4.327	4.727	0.170	0.186
M	1.778 REF.		0.070 REF.	
N	0.762 REF.		0.018 REF.	
L	9.800	10.400	0.386	0.409
L1	2.9 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
V	4.830 REF.		0.190 REF.	
Φ	1.100	1.300	0.043	0.051