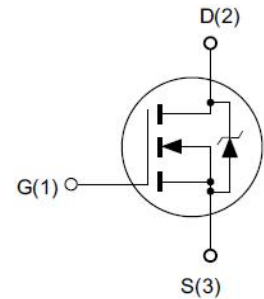


Features

- ◆ 650V, 15A, $R_{DS(ON)}(Typ.) = 0.28\Omega @ V_{GS} = 10V$
- ◆ Advanced Super Junction Technology
- ◆ Easy To Control Gate Switching
- ◆ 100% Avalanche Tested

Application

- ◆ LED Lighting
- ◆ LCD & PDP TV
- ◆ Power, Adaptor
- ◆ Boost PFC Switch
- ◆ HB Or AHB Or LLC Topologies



Absolute Maximum Ratings $T_c = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-Source Voltage ^a	650	V
V_{GS}	Gate-Source Voltage	± 30	
I_D	Drain Current-Continuous, $T_c = 25^\circ\text{C}$	15	A
I_{DM}	Drain Current-Pulsed ^b	45	
P_D	Maximum Power Dissipation @ $T_J = 25^\circ\text{C}$	118	W
dv/dt	Peak Diode Recovery dv/dt ^c	15	V/ns
E_{AS}	Single Pulsed Avalanche Energy ^d	405	mJ
T_J, T_{STG}	Operating and Store Temperature Range	150, -55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.06	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	

Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

■ Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 650V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Forward Gate Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 30V$	-	-	± 100	nA

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.8	-	4.2	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^c	$V_{GS} = 10V, I_D = 7.5A$	-	0.28	0.32	Ω

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_G	Gate Resistance	$f = 1.0MHz$	-	5.7	-	Ω
C_{iss}	Input Capacitance	$V_{DS} = 50V,$ $V_{GS} = 0V,$ $f = 10kHz$	-	1020	-	pF
C_{oss}	Output Capacitance		-	108	-	
C_{rss}	Reverse Transfer Capacitance		-	5.11	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 400V,$ $I_D = 3.8A,$ $R_G = 10\Omega$	-	8.4	-	ns
t_r	Turn-On Rise Time		-	21.2	-	
$t_{d(off)}$	Turn-Off Delay Time		-	32.4	-	
t_f	Turn-Off Fall Time		-	20.8	-	
Q_g	Total Gate Charge	$V_{DD} = 400V,$ $V_{GS} = 10V,$ $I_D = 3.8A$	-	22.94	-	nC
Q_{gs}	Gate-Source Charge		-	5.7	-	
Q_{gd}	Gate-Drain Charge		-	13.6	-	

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	$V_{GS} = 0V$	-	-	15	A
I_{SM}	Maximum Pulsed Current	$V_{GS} = 0V$	-	-	45	
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0V, I_F = 1A$	-	0.74	-	V
T_{rr}	Body Diode Reverse Recovery Time	$V_R = 400V, I_F = 2A,$ $di_F/dt = 100A/\mu s$	-	216	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$V_R = 400V, I_F = 2A,$ $di_F/dt = 100A/\mu s$	-	1.3	-	μC

Notes:

- $T_J = +25^\circ C$ to $+150^\circ C$
- Repetitive rating; pulse width limited by maximum junction temperature.
- Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$
- $L = 10mH, V_{DD} = 50V, I_{AS} = 9A, R_G = 25\Omega$ Starting $T_J = 25^\circ C$.

■ Characteristic Curve

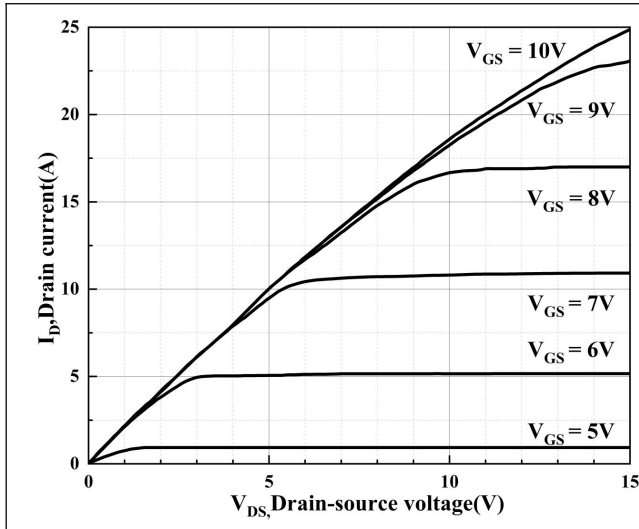


Figure 1. Typical Output Characteristics

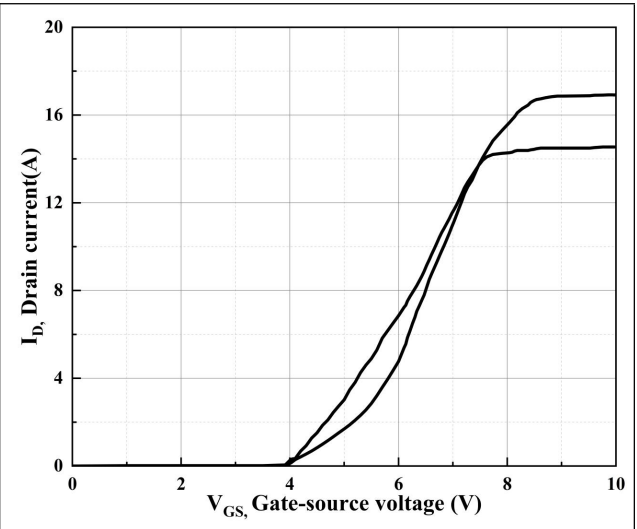


Figure 2. Typical Transfer Characteristics

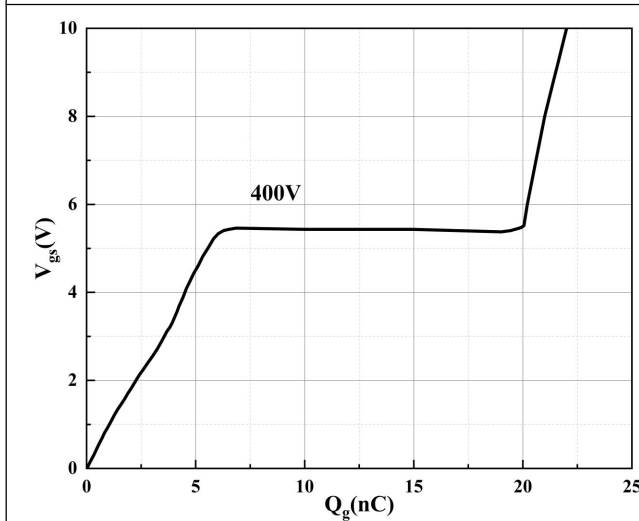


Figure 3. Typical Gate Charge

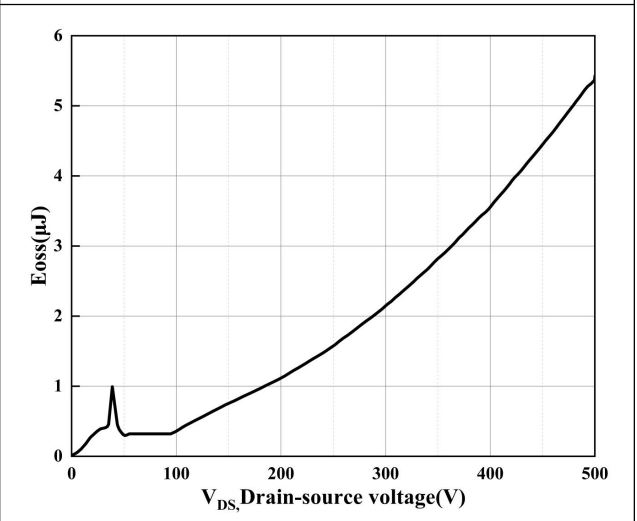


Figure 4. Typical C_{oss} Stored Energy

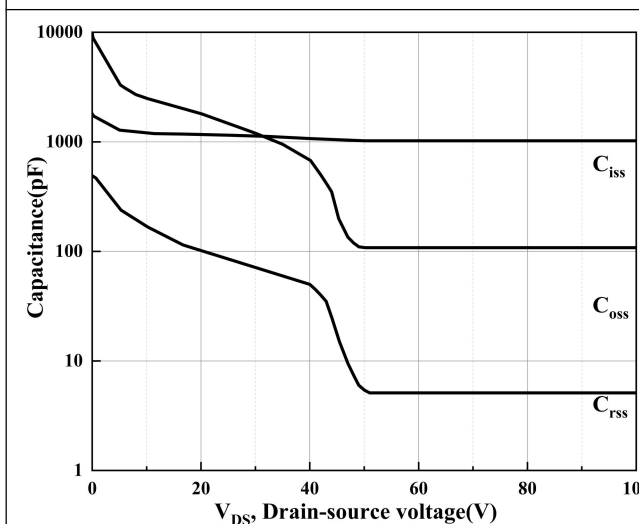


Figure 5. Typical Capacitance

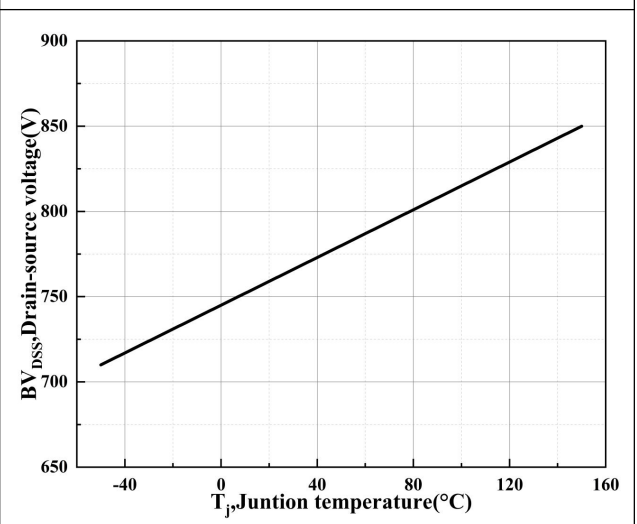
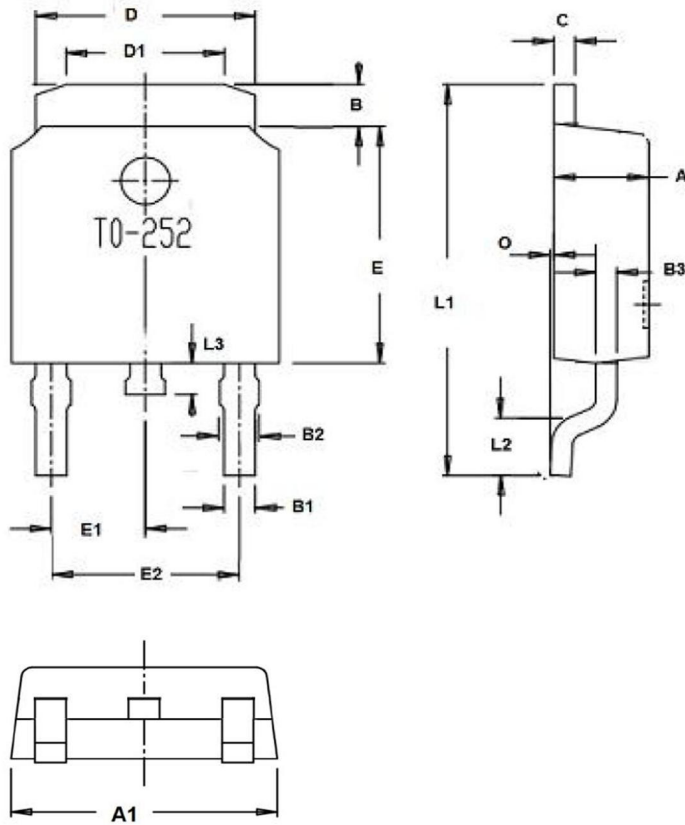


Figure 6. Drain-source Breakdown Voltage

■ Package Information

TO-252



Dim.	Min.	Max.
A	2.1	2.5
A1	6.3	6.9
B	0.96	1.42
B1	0.74	0.86
B2	0.74	0.94
B3		
C	Typ0.5	
D	5.33	5.53
D1	3.65	4.05
E	6.0	6.2
E1	Typ2.29	
E2	Typ4.58	
O	0	0.15
L1	9.9	10.5
L2	Typ1.65	
L3	0.6	1.0
All Dimensions in millimeter		