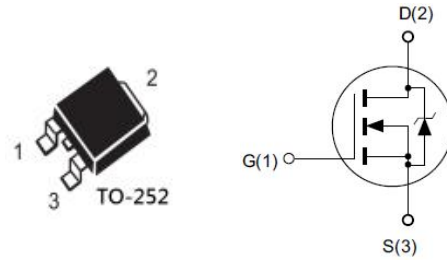


Features

- ◆ 40V, 60A, $R_{DS(on)}(Typ.) = 5.9m\Omega @ V_{GS} = 10V$
- ◆ Excellent $R_{DS(on)}$ and Low Gate Charge
- ◆ Advanced Trench Technology
- ◆ 100% E_{AS} Guaranteed

Application

- ◆ Load Switch
- ◆ PWM Application
- ◆ Power Management



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

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-Source Voltage ^a	40	V
V_{GS}	Gate-Source Voltage	± 20	
I_D	Drain Current-Continuous	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	
I_{DM}	Drain Current-Pulsed ^b	240	
P_D	Maximum Power Dissipation, $T_C = 25^\circ\text{C}$	114	W
E_{AS}	Single Pulsed Avalanche Energy ^c	115	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	1.1	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	37	

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	$V_{GS} = 0V, I_D = 250\mu A$	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 40V, V_{GS} = 0V$	-	-	1.0	μA
I_{GSS}	Forward Gate Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	1.0	-	2.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^d	$V_{GS} = 10V$, $I_D = 30A$	-	5.9	7.3	mΩ
		$V_{GS} = 4.5V$, $I_D = 20A$	-	7.1	8.9	

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_G	Gate Resistance	$V_{DS} = V_{GS} = 0V$, $f = 1.0MHz$	-	TBD	-	Ω
C_{iss}	Input Capacitance	$V_{DS} = 20V$, $V_{GS} = 0V$, $f = 1.0MHz$	-	2443	-	pF
C_{oss}	Output Capacitance		-	167	-	
C_{rss}	Reverse Transfer Capacitance		-	138	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 20V$, $V_{GS} = 10V$, $I_D = 20A$, $R_{GEN} = 3.0\Omega$	-	10	-	ns
t_r	Turn-On Rise Time		-	28	-	
$t_{d(off)}$	Turn-Off Delay Time		-	40	-	
t_f	Turn-Off Fall Time		-	7	-	
Q_g	Total Gate Charge	$V_{DS} = 20V$, $V_{GS} = 0$ to $10V$, $I_D = 20A$	-	48	-	nC
Q_{gs}	Gate-Source Charge		-	10	-	
Q_{gd}	Gate-Drain Charge		-	10	-	

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	$V_G = V_D = 0V$, Force Current	-	-	60	A
I_{SM}	Maximum Pulsed Current		-	-	240	
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0V$, $I_S = 30A$	-	-	1.2	V
T_{rr}	Body Diode Reverse Recovery Time	$I_F = 20A$, $di_F/dt = 100A/\mu s$	-	11	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F = 20A$, $di_F/dt = 100A/\mu s$	-	5	-	nC

Notes:

- $T_J = +25\text{ }^{\circ}C$ to $+150\text{ }^{\circ}C$.
- Repetitive rating: pulse width limited by maximum junction temperature.
- $L = 0.5mH$, $V_{DD} = 25V$, $I_{AS} = 21.5A$, $R_G = 25\Omega$ Starting $T_J = 25\text{ }^{\circ}C$.
- Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

Characteristic Curve

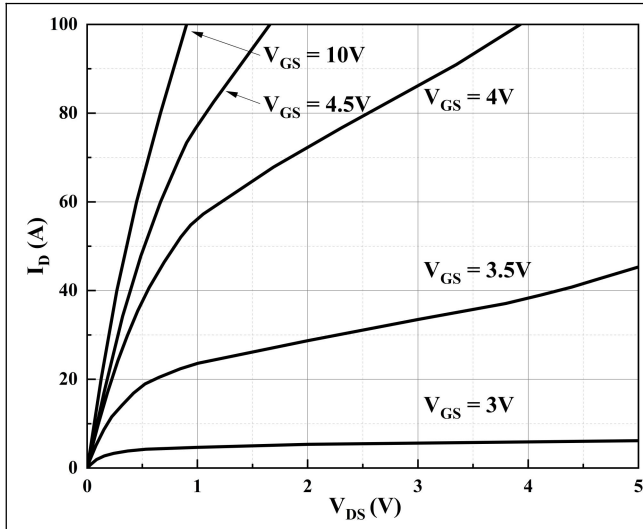


Figure 1. Typical Output Characteristics

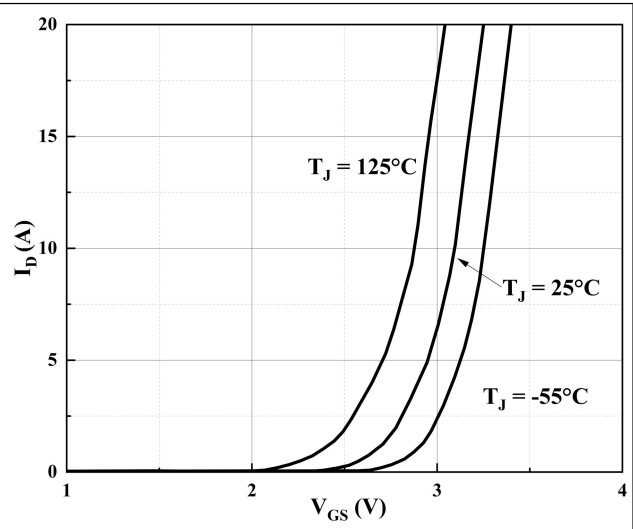


Figure 2. Typical Transfer Characteristics

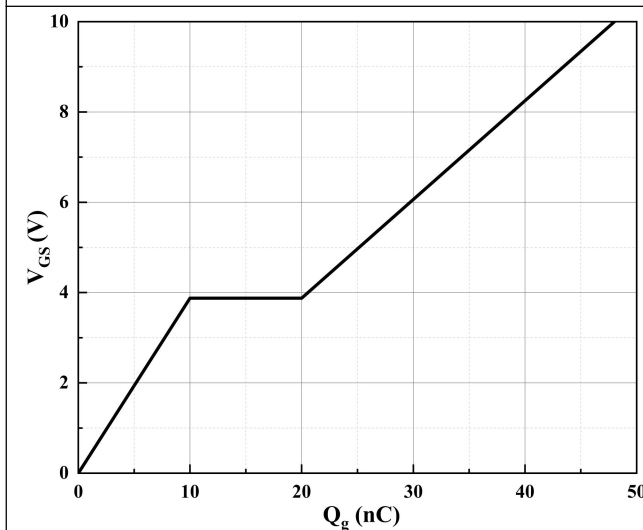


Figure 3. Typical Gate Charge

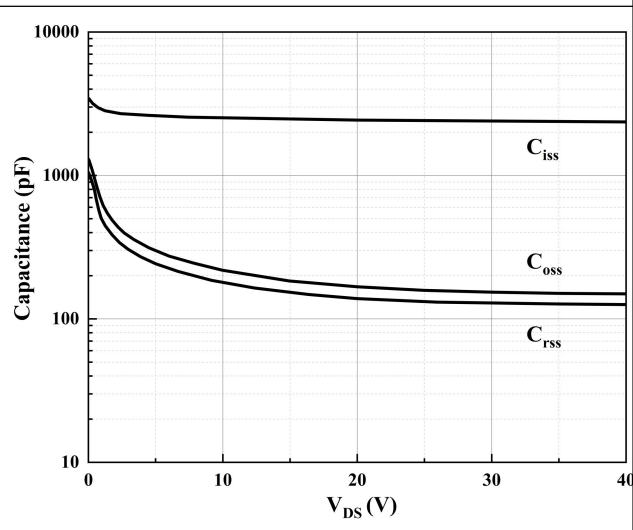


Figure 4. Typical Capacitance

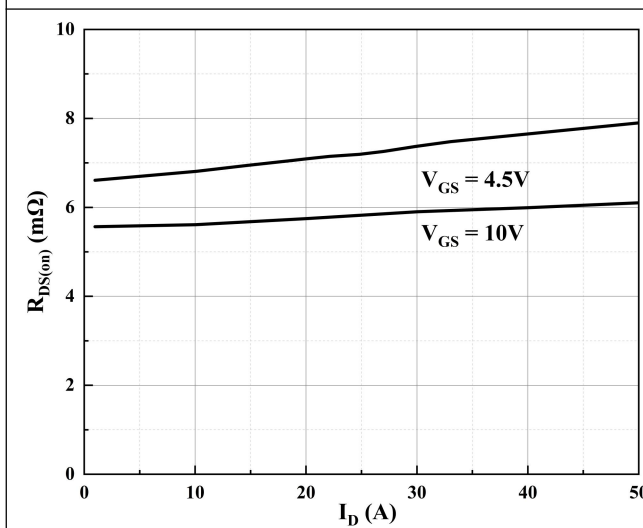


Figure 5. Static Drain-Source On-Resistance vs. Drain Current

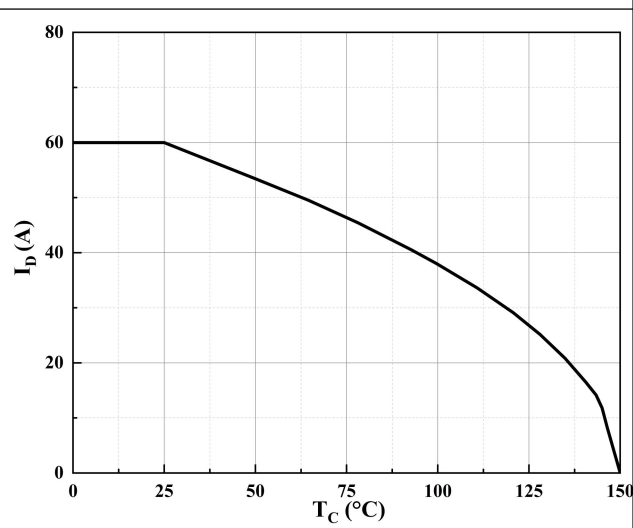


Figure 6. Maximum Continuous Drain Current vs. Case Temperature

■ Characteristic Curve

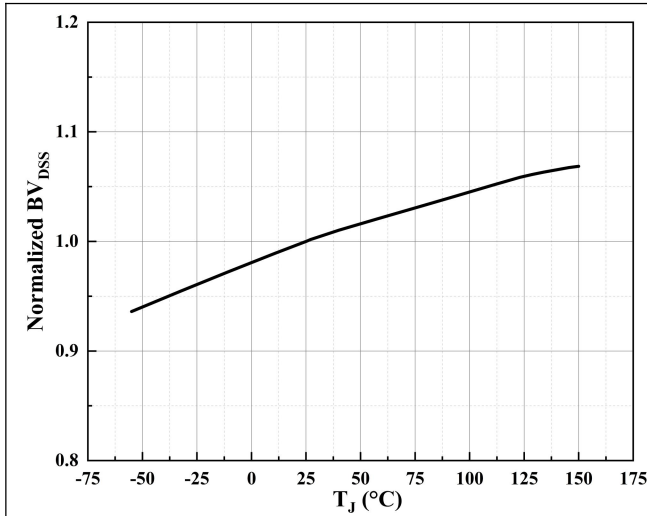


Figure 7. Normalized Drain-Source Breakdown Voltage vs. Junction Temperature

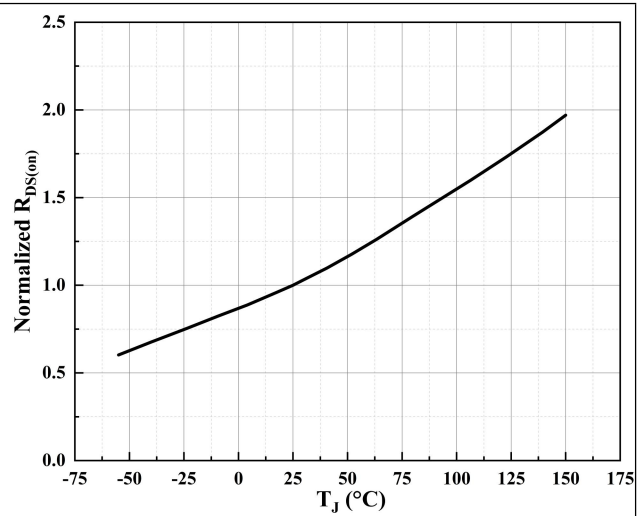


Figure 8. Normalized Static Drain-Source On-Resistance vs. Junction Temperature

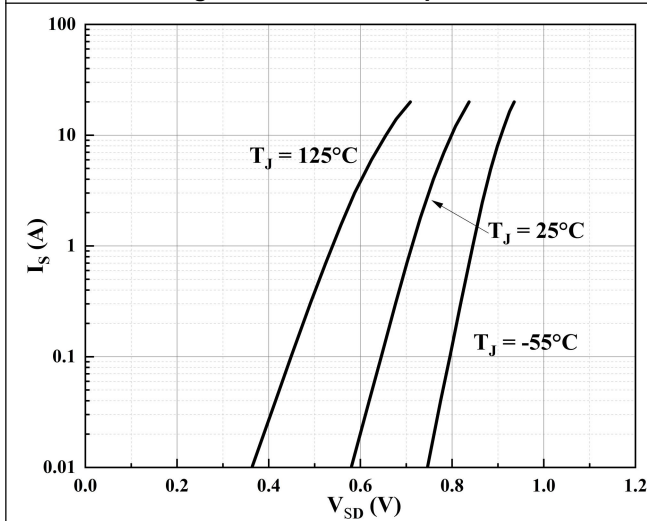


Figure 9. Body Diode Characteristics

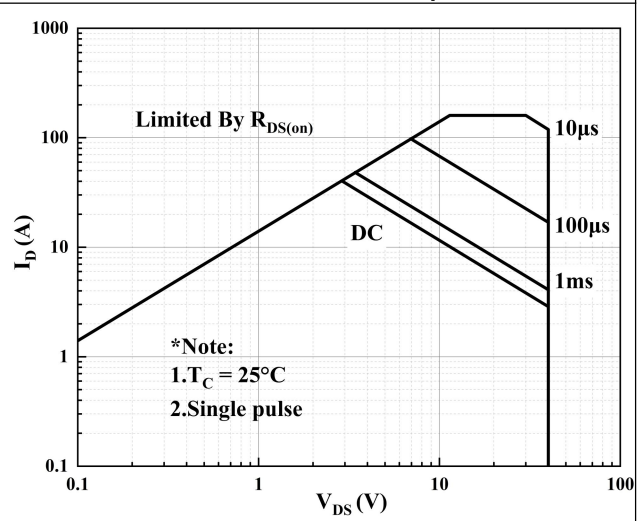


Figure 10. Maximum Safe Operating Area

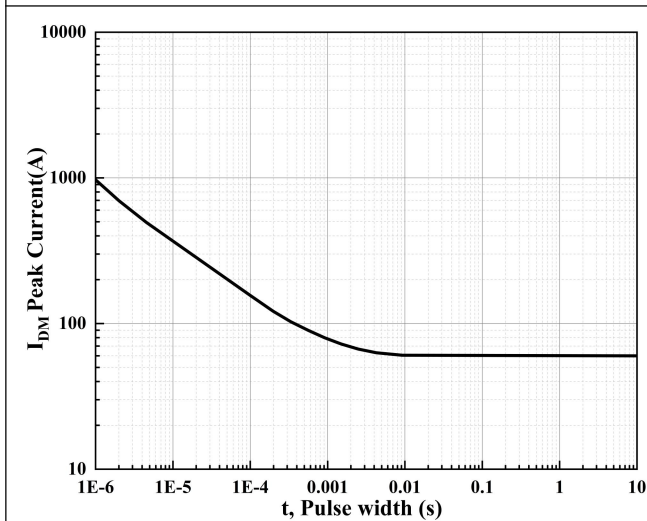


Figure 11. Peak Current Capacity

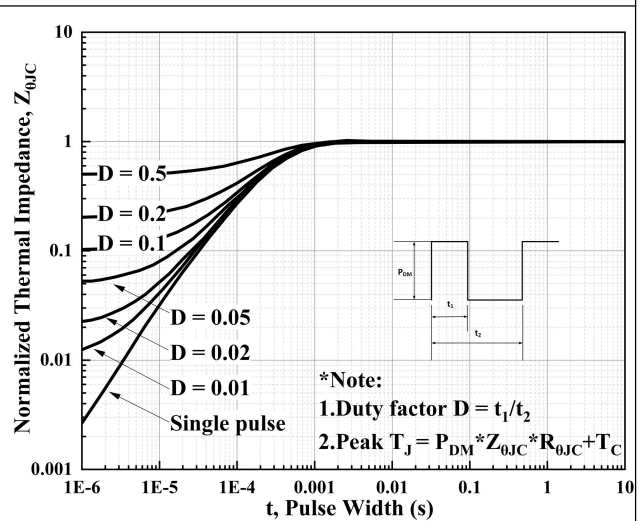
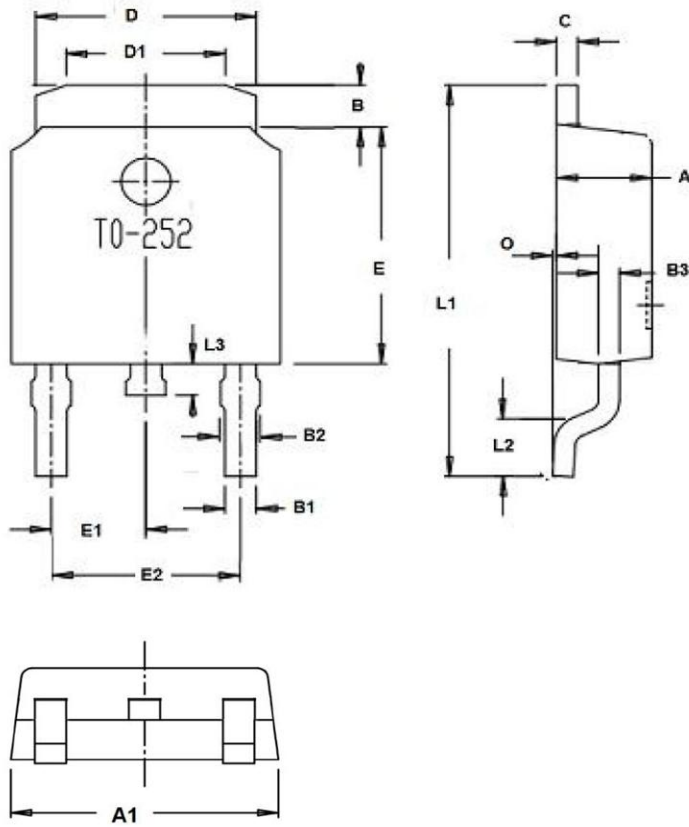


Figure 12. Normalized Maximum Transient Thermal Impedance

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	Typ0.5	
C	5.33	5.53
D	3.65	4.05
D1	6.0	6.2
E	Typ2.29	
E1	Typ4.58	
E2	0	0.15
O	9.9	10.5
L1	Typ1.65	
L2	0.6	1.0
L3	All Dimensions in millimeter	