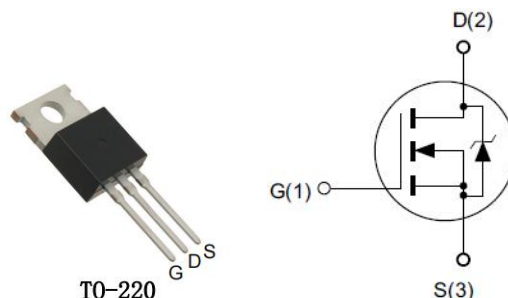


Features

- ◆ 650V, 7A, $R_{DS(ON)}(Typ.) = 1.1\Omega @ V_{GS} = 10V$.
- ◆ Low C_{rss}
- ◆ Fast Switching
- ◆ 100% Avalanche Tested

Application

- ◆ Adapter
- ◆ LCD Panel Power
- ◆ E-Bike Charger
- ◆ Switching Mode Power Supply



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

Symbol	Parameter	Limit	Unit
		TO-220	
V_{DS}	Drain-Source Voltage ^a	650	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Drain Current-Continuous, $T_c = 25^\circ\text{C}$	7	A
	Drain Current-Continuous, $T_c = 100^\circ\text{C}$	4.4	A
I_{DM}	Drain Current-Pulsed ^b	28	A
P_D	Maximum Power Dissipation @ $T_J = 25^\circ\text{C}$	100	W
EAS	Single Pulsed Avalanche Energy ^d	245	mJ
T_J, T_{STG}	Operating and Store Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-Case Max.	1.25	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max.	62.5	$^\circ\text{C/W}$

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	$V_{DS}=V_{GS}$, $I_D=250\mu A$	2.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^c	$V_{GS}=10V$, $I_D=3.5A$	-	1.1	1.4	Ω

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1.0MHz$	-	1135	-	pF
C_{oss}	Output Capacitance		-	88	-	pF
C_{rss}	Reverse Transfer Capacitance		-	4.6	-	pF

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=325V$, $I_D=7A$, $R_G=10\Omega$, $V_{GS}=10V$	-	19	-	ns
t_r	Turn-On Rise Time		-	21	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	42	-	ns
t_f	Turn-Off Fall Time		-	19	-	ns
Q_g	Total Gate Charge	$V_{DS}=520V$, $I_D=7A$, $V_{GS}=10V$	-	24	-	nC
Q_{gs}	Gate-Source Charge		-	5.1	-	nC
Q_{gd}	Gate-Drain Charge		-	9.5	-	nC

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	$V_{GS}=0V$	-	-	7	A
I_{SM}	Maximum Pulsed Current	$V_{GS}=0V$	-	-	28	A
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS}=0V$, $I_S=7A$	-	-	1.4	V
T_{rr}	Body Diode Reverse Recovery Time	$di/dt=100A/\mu s$ $I_S=10A$, $V_{GS}=0V$	-	370	-	ns
Q_{rr}	Reverse Recovery Charge		-	1920	-	nC

Notes:

- $T_J=-55^\circ C$ to $+150^\circ C$.
- Repetitive rating; pulse width limited by maximum junction temperature.
- Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
- $L=10mH$, $V_{DD}=50V$, $I_{AS}=7A$, $R_G=25\Omega$ Starting $T_J=25^\circ C$.

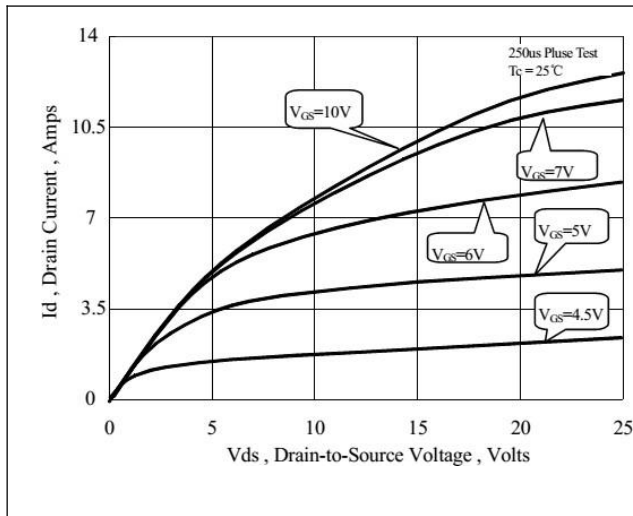


Figure 1. On-State Characteristics

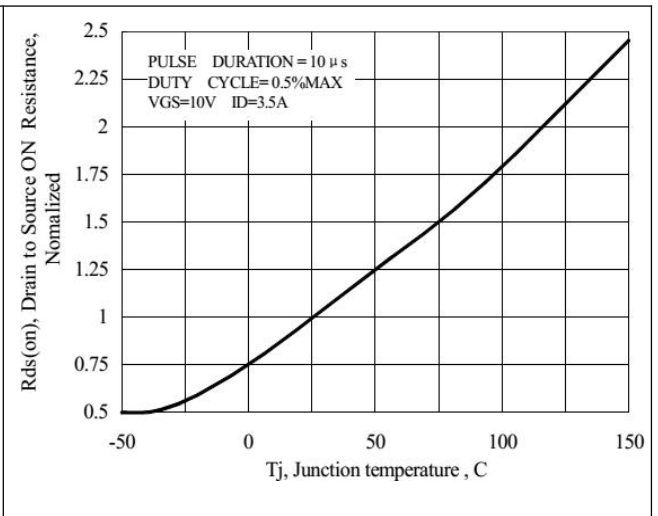


Figure 2. Normalized On-Resistance Variation with Temperature

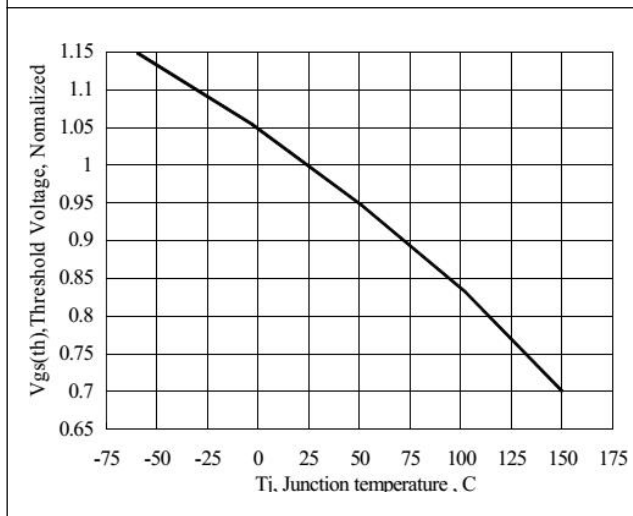


Figure 3. Typical Theshold Voltage vs Junction Temperature

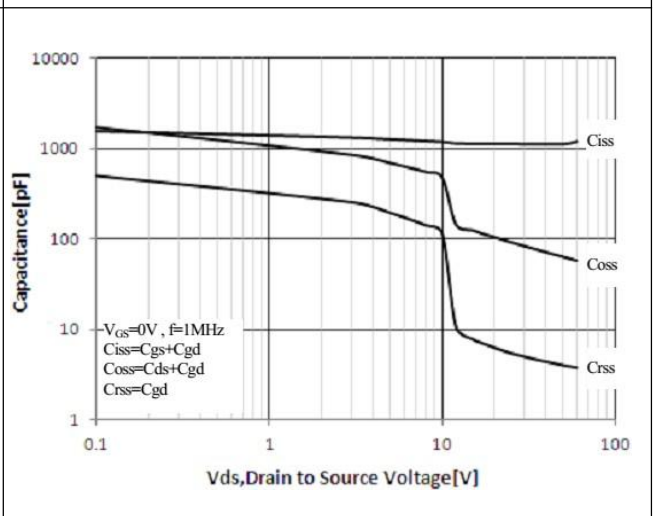


Figure 4. Capacitance Characteristics

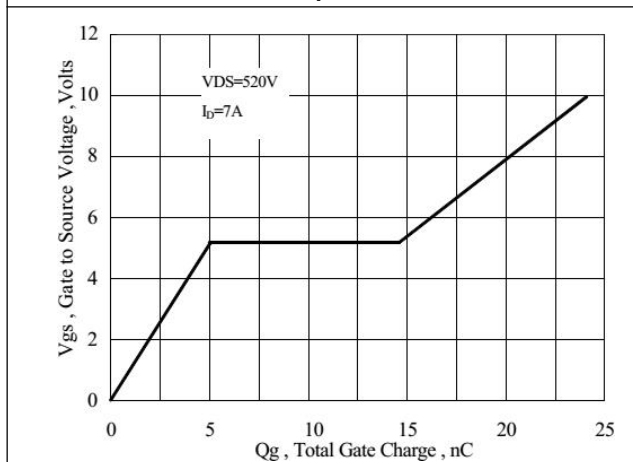


Figure 5. Gate Charge Characteristics

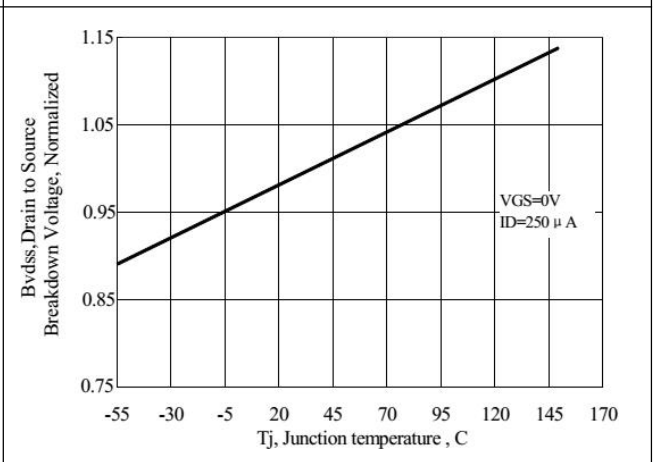


Figure 6. Typical Breakdown Voltage vs Junction Temperature

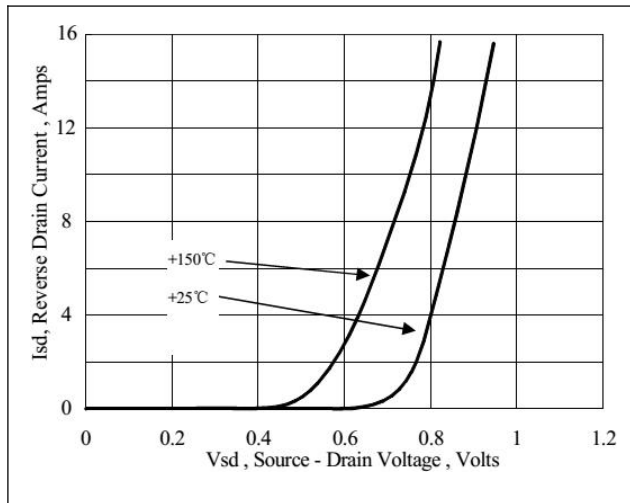


Figure 7. Typical Body Diode Transfer Characteristics

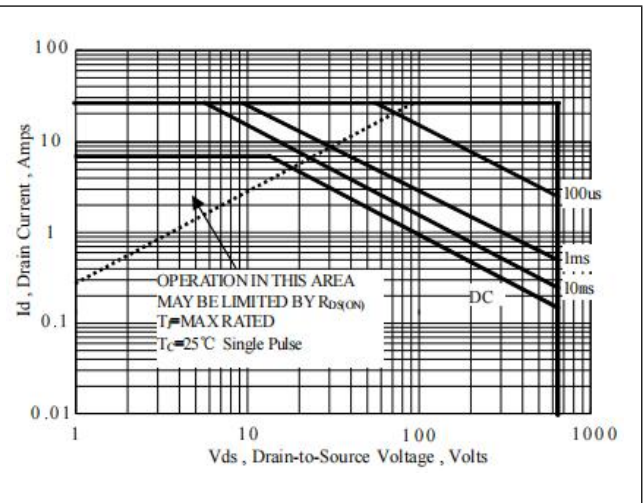


Figure 8. Maximum Safe Operating Area

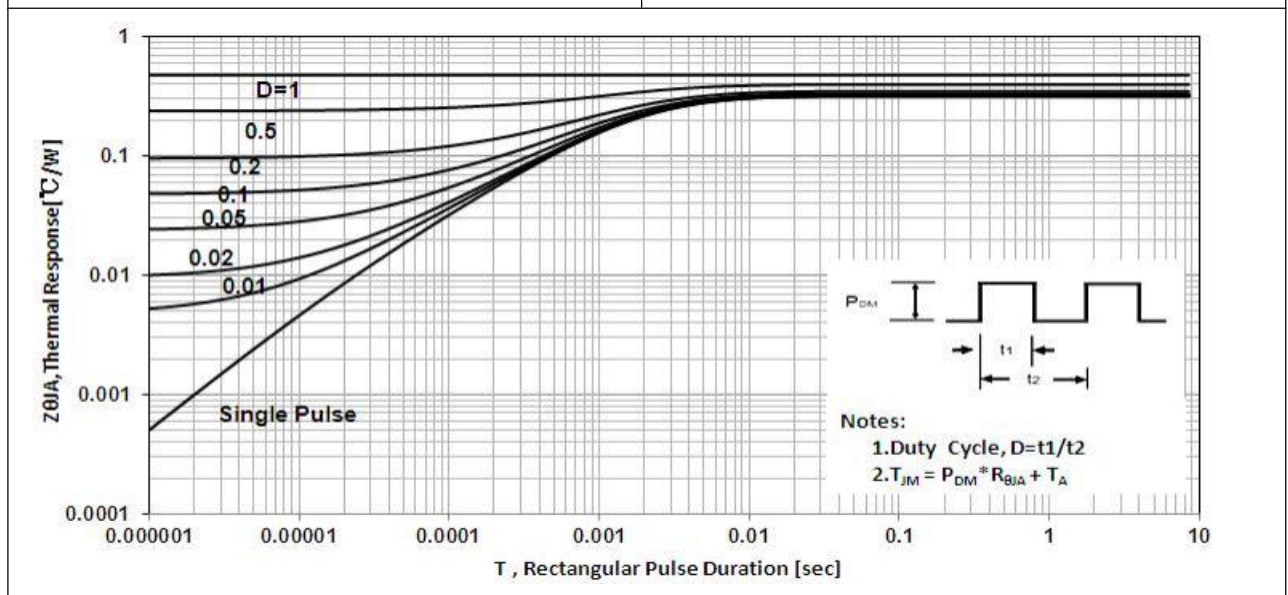


Figure 9. Maximum Effective Thermal Impedance , Junction to Case

■ Package Information

