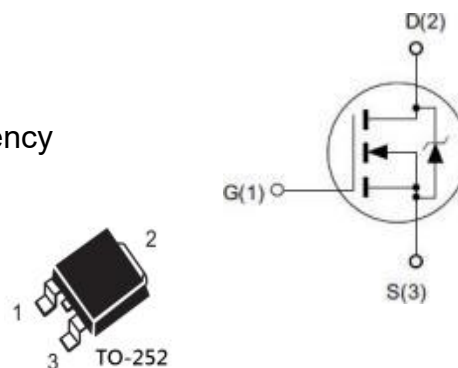


Features

- ◆ 650V, 7A, $R_{DS(ON)}(Typ.) = 0.58\Omega @ V_{GS} = 10V$.
- ◆ CRM(CQ) Super_Junction technology
- ◆ Much lower $R_{on} \cdot A$ performance for On-state efficiency
- ◆ Much lower FOM for fast switching efficiency

Application

- ◆ Charger
- ◆ Power Supply
- ◆ LED/LCD/PDP TV and monitor Lighting
- ◆ Solar/Renewable/UPS-Micro Inverter System



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

Symbol	Parameter	Limit	Unit
		TO-252	
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, $T_c = 100^\circ\text{C}$	5	A
I_{DM}	Drain Current-Pulsed ^b	28	A
P_D	Maximum Power Dissipation @ $T_J = 25^\circ\text{C}$	75	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.	1.66	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max.	133	$^\circ\text{C/W}$

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



MJD07N65

N-Channel Power MOSFET

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=250\mu A$	2.5	-	4.5	V
$R_{DS(on)}$	Static Drain-Source On- Resistance ^c	$V_{GS} = 10V$, $I_D=3.5A$	-	0.58	0.65	Ω

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	$V_{DS} = 100V$, $V_{GS} = 0V$, $f = 1.0MHz$	-	382	-	pF
C_{oss}	Output Capacitance		-	29	-	pF
C_{rss}	Reverse Transfer Capacitance		-	24	-	pF

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 400V$, $I_D=3.5A$, $R_G=25\Omega$, $V_{GS}=10V$	-	7.4	-	ns
t_r	Turn-On Rise Time		-	9.4	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	48	-	ns
t_f	Turn-Off Fall Time		-	7.5	-	ns
Q_g	Total Gate Charge	$V_{DS}=480V$, $I_D=3.5A$, $V_{GS}=10V$, $f=1MHz$	-	12.5	-	nC
Q_{gs}	Gate-Source Charge		-	2.7	-	nC
Q_{gd}	Gate-Drain Charge		-	5.2	-	nC

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0V$, $I_S = 3.5A$	-	0.85	1.2	V
T_{rr}	Body Diode Reverse Recovery Time	$di/dt=100A/us$. $I_S=3.5A$	-	189	-	ns
Q_{rr}	Reverse Recovery Charge		-	1500	-	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 $T_J=25^{\circ}C$.

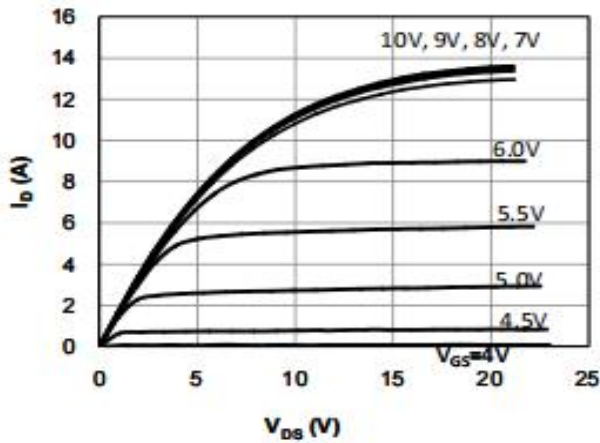


Figure 1. Typical Output Characteristics

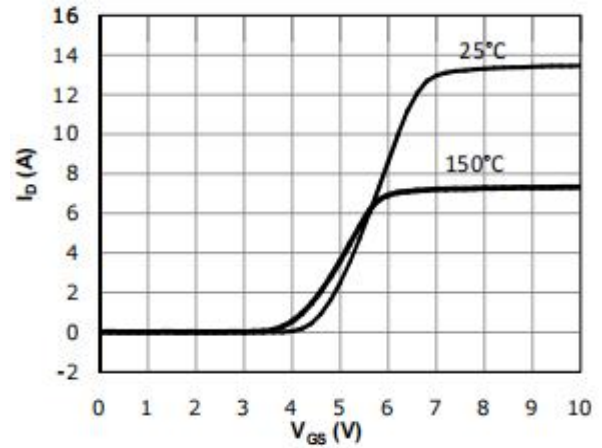


Figure 2. Typical Transfer Characteristics

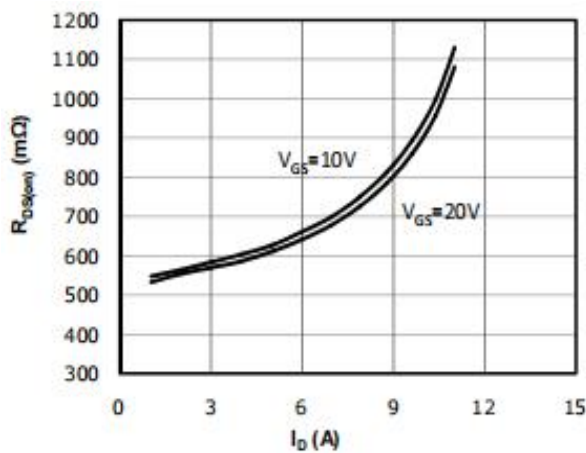


Figure 3. On-Resistance vs. Drain Current

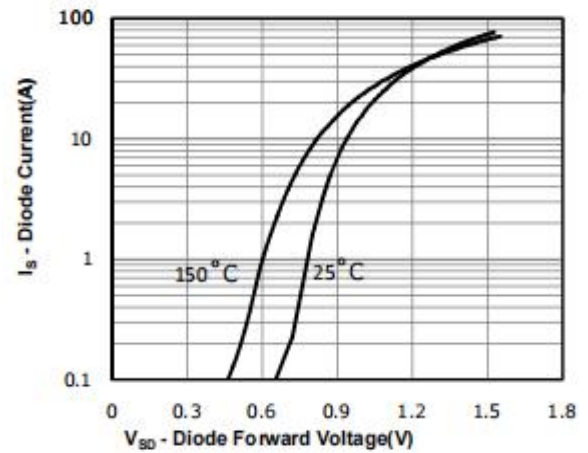


Figure 4. Body-Diode Characteristics

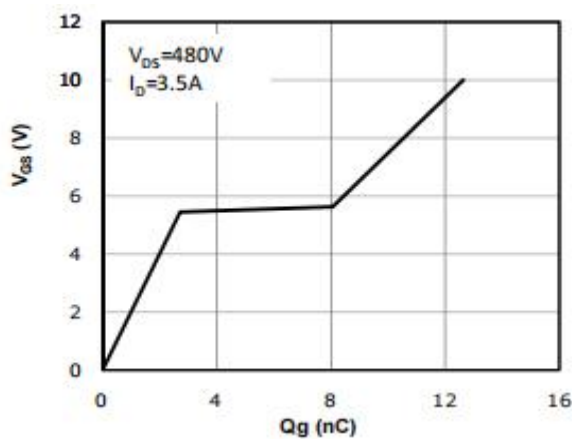


Figure 5. Gate Charge Characteristics

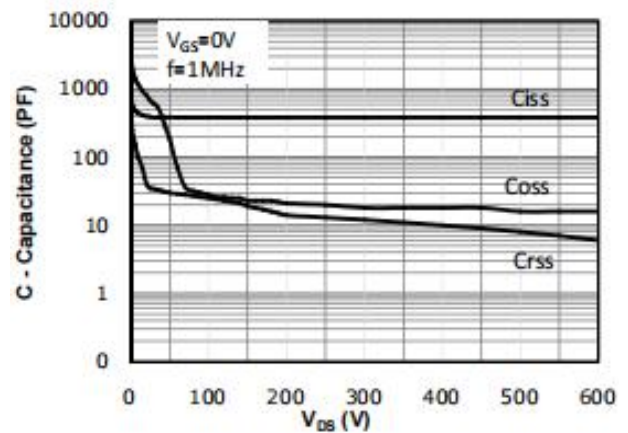


Figure 6. Capacitance Characteristics

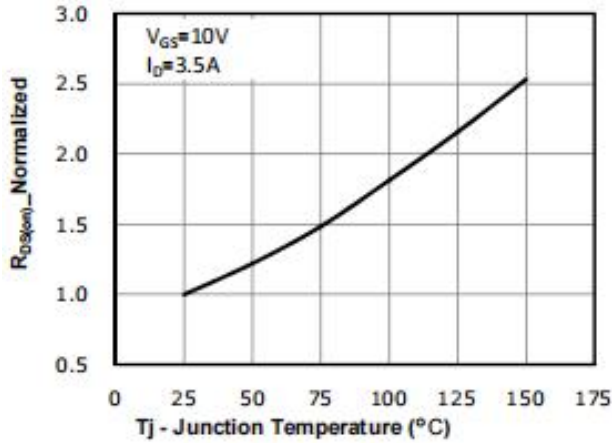


Figure 7. Normalized On-Resistance Variation with Temperature

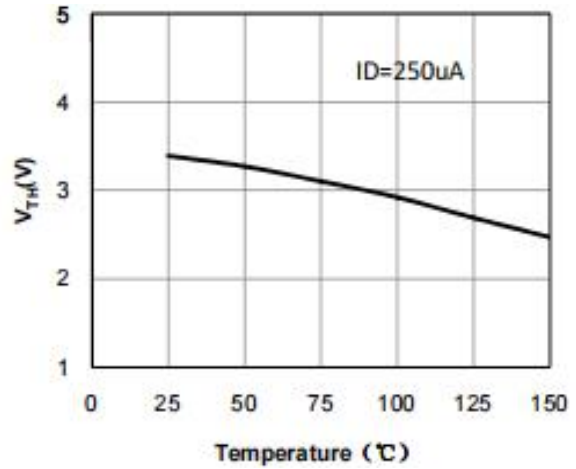


Figure 8. Typical Threshold Voltage vs Junction Temperature

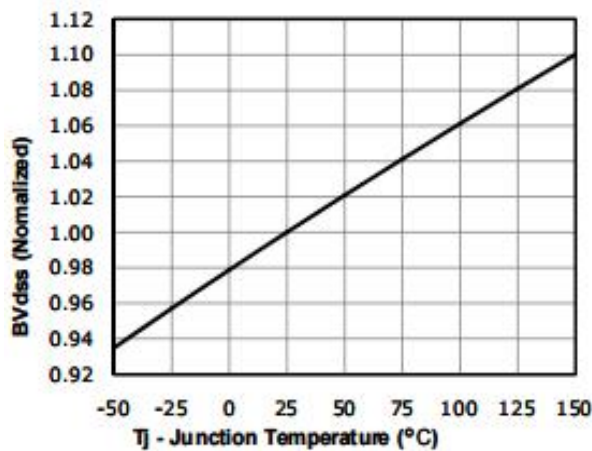


Figure 9. Normalized Breakdown voltage vs. Junction Temperature

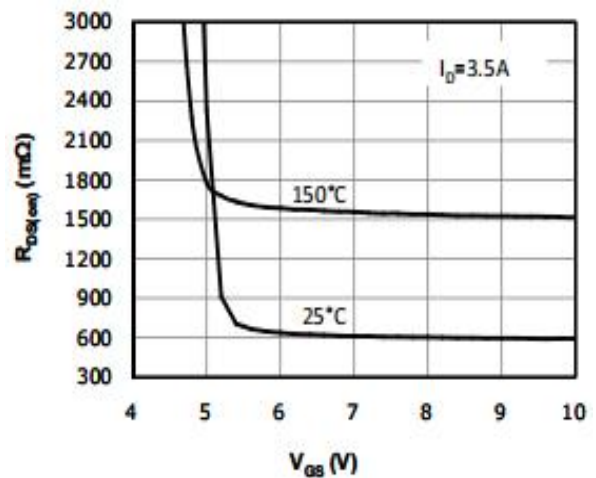


Figure 10. On-Resistance vs Gate Voltage

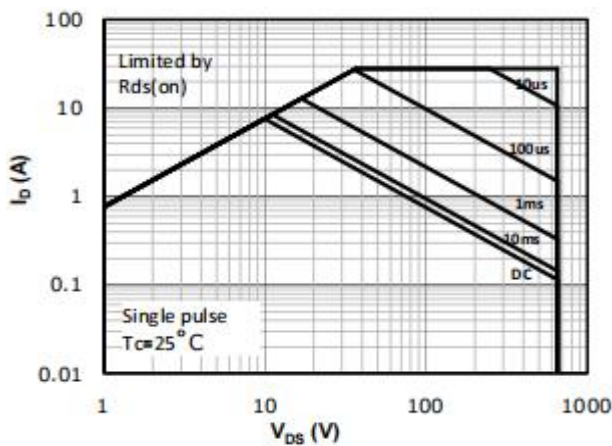


Figure 11. Maximum Safe Operating Area

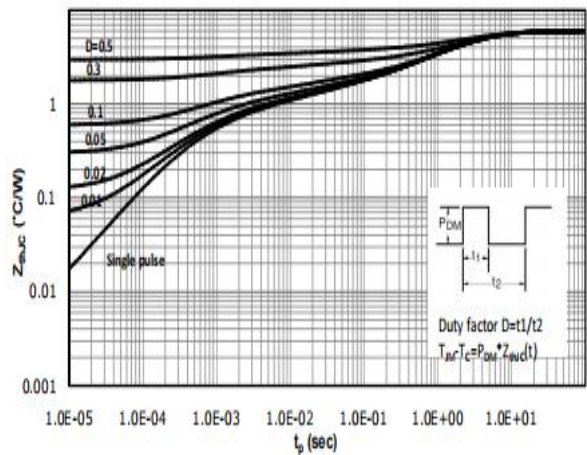


Figure 12: Normalized Maximum Transient Thermal Impedance

■ Package Information

TO-252

