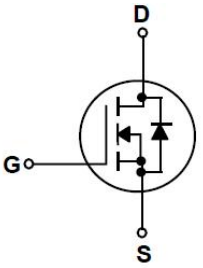
MU3007Y

N-Channel Enhancement Mode MOSFET

Features

- ◆ 30V,160A, $R_{DS(ON)}$(Typ.)=1.5mΩ@V_{GS} = 10V
- ◆ Very Low On-Resistance $R_{DS(ON)}R_{DS(ON)}$
- ◆ Fast switching
- ◆ 100% avalanche tested
- ◆ Improved dv/dt capability



Application

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

Absolute Maximum Ratings Tc = 25°C unless otherwise noted

Symbol	Parameter		Rating	Unit
V_{DS}	Drain-Source Voltage [a]		30	V
V_{GS}	Gate-Source Voltage		± 20	
I_D	Drain Current-Continuous	T_C =25°C	160	A
		T_C =100°C	104	
I_{DM}	Drain Current-Pulsed [b]		640	
P_D	Maximum Power Dissipation @ T_J =25°C		50	W
E_{AS}	Single Pulsed Avalanche Energy [d]		625	mJ
T_J, T_{STG}	Operating and Store Temperature Range		150, -55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance Junction-Case	2.5	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [c]	49	

Electrical Characteristics T_J = 25°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 = 250μA	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Forward Gate Body Leakage Current	V_{DS} = 0V, V_{GS} = ±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 = 250μA	1	1.6	2.2	V
$R_{DS(on)}$	Static Drain-Source On-Resistance [c]	V_{GS} = 10V, I_D = 20A	-	1.5	2.0	mΩ
		V_{GS} = 4.5V, I_D = 15A	-	2.2	3.0	

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	V_{DS} = 30V, V_{GS} = 0V, f = 1MHz	-	7710	-	pF
C_{oss}	Output Capacitance		-	845	-	
C_{rss}	Reverse Transfer Capacitance		-	838	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = 30V, V_{GS} = 10V, I_D = 30A, R_G= 1.8Ω	-	18	-	ns
t_r	Turn-On Rise Time		-	10	-	
$t_{d(off)}$	Turn-Off Delay Time		-	64	-	
t_f	Turn-Off Fall Time		-	16	-	
Q_g	Total Gate Charge	V_{DS} = 15V, V_{GS} = 10V, I_D = 30A	-	136	-	nC
Q_{gs}	Gate-Source Charge		-	42	-	
Q_{gd}	Gate-Drain Charge		-	16	-	

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Maximum Continuous Drain-Source Diode Forward Current	V_{GS} = 0V	-	-	160	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current	V_{GS} = 0V	-	-	640	
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_{SD} = 20A	-	-	1.2	V
T_{rr}	Body Diode Reverse Recovery Time	I_F = 20A, dI_F/dt = 100A/μs	-	30	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F = 20A, dI_F/dt = 100A/μs	-	22	-	nC

Notes:

a. T_J = +25 ℃ to +150 ℃

b. Repetitive rating; pulse width limited by maximum junction temperature.

c. Pulse width ≦ 300μs; duty cycle ≦ 2%

d. L = 0.5mH, V_{DD} = 25V, I_{AS} = 50A, R_G = 25Ω Starting T_J = 25 ℃.

■ Characteristic Curve

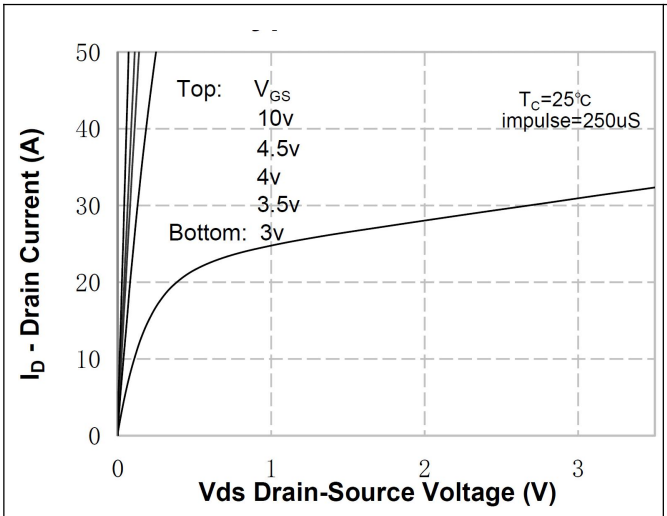


Figure 1. On-Region Characteristics

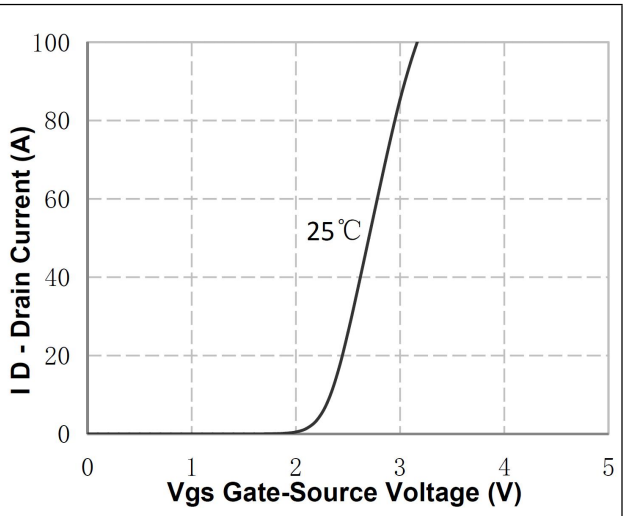


Figure 2. Transfer Characteristics

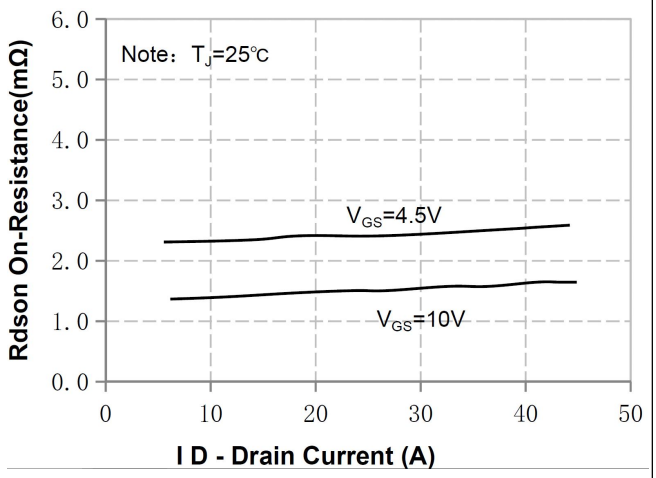


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

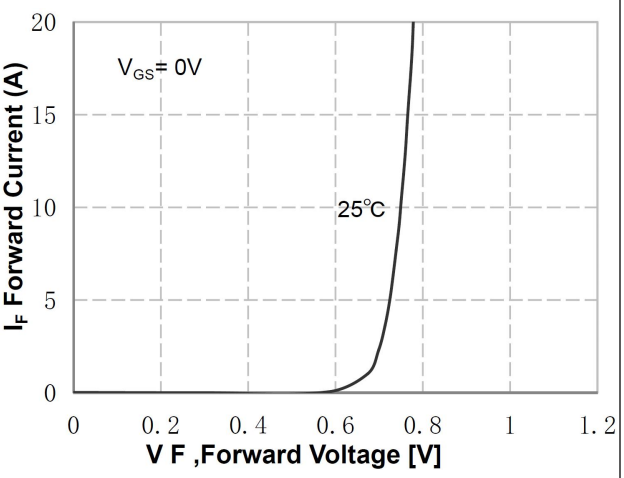


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

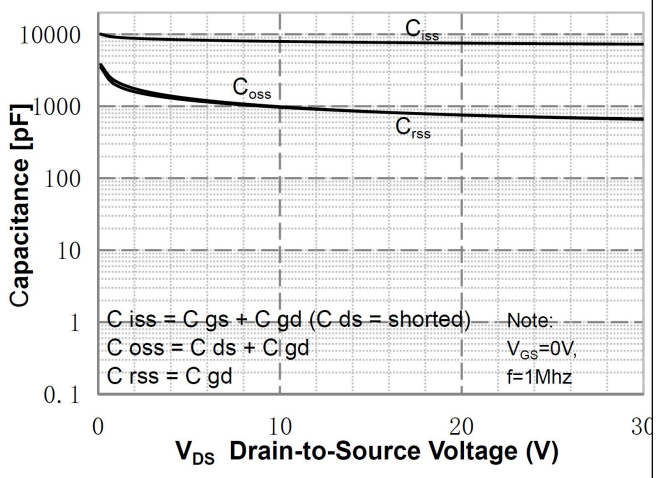


Figure 5. Capacitance Characteristics

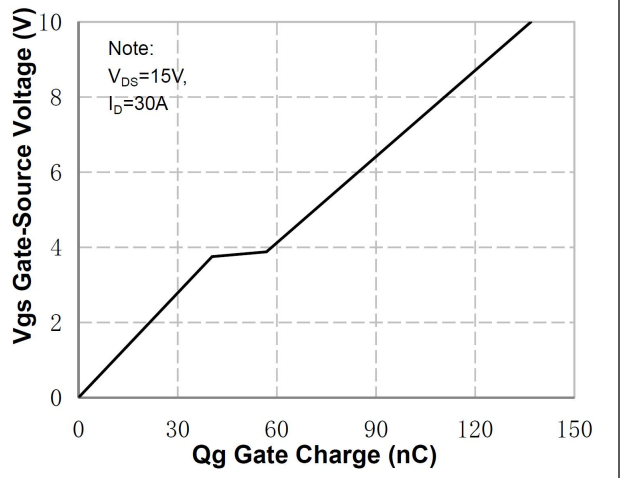


Figure 6. Gate Charge Characteristics

■ Characteristic Curve

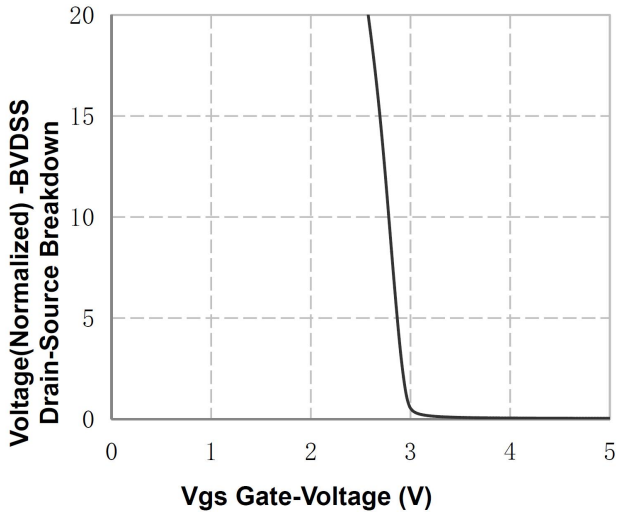


Figure 7. Breakdown Voltage Variation vs Gate-Voltage

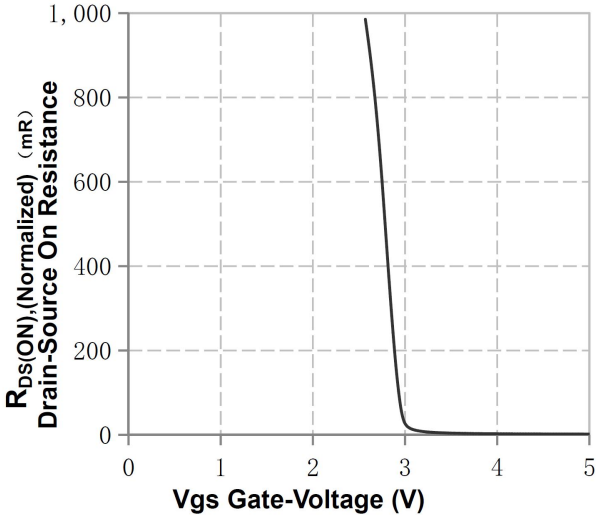


Figure 8. On-Resistance Variation vs Gate Voltage

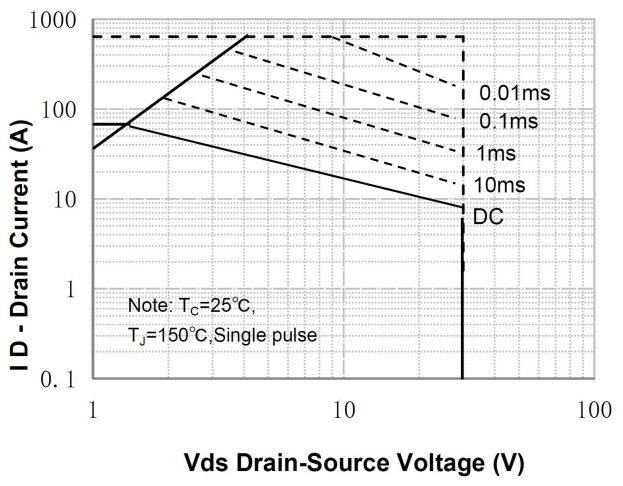


Figure 9. Maximum Safe Operating Area

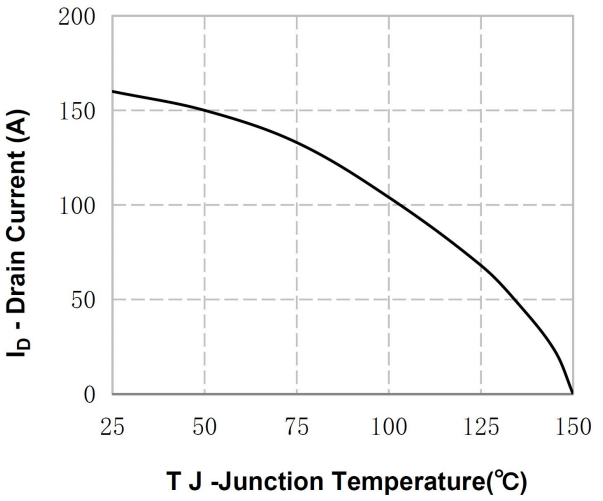


Figure 10. Maximum Continuous Drain Current vs Case Temperature

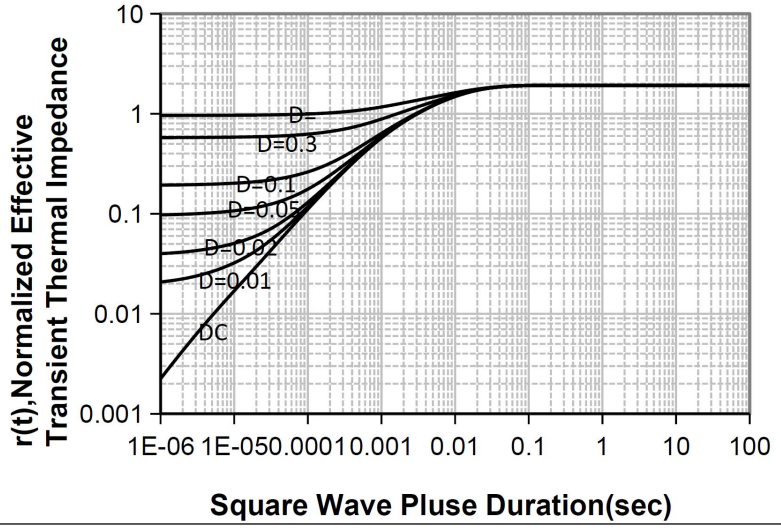
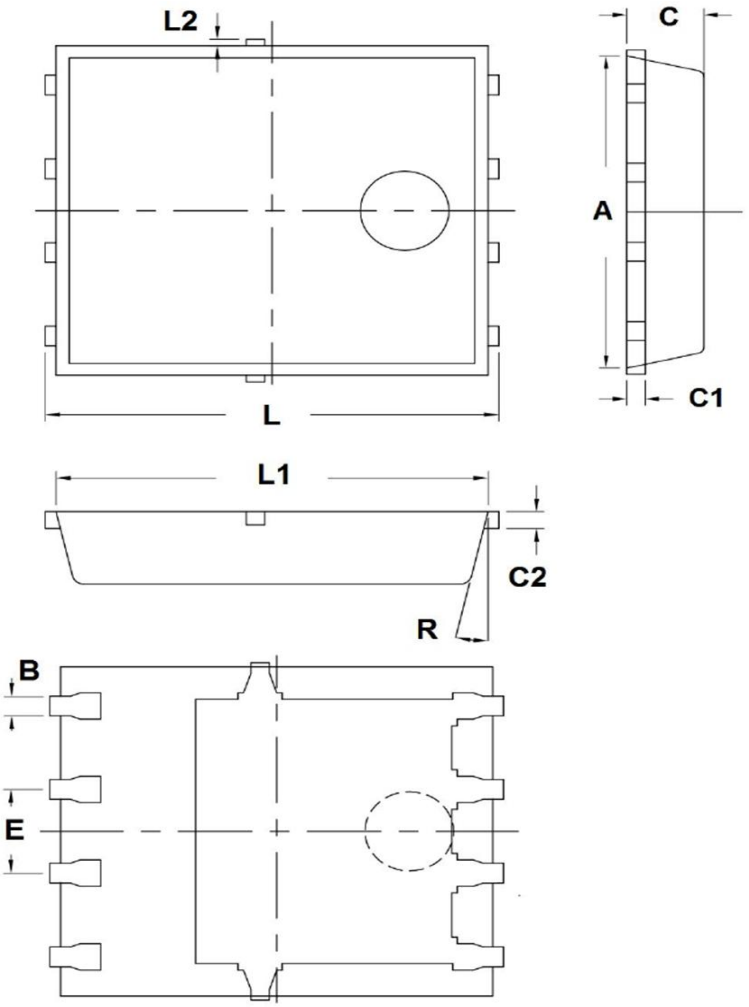


Figure 11. Transient Thermal Response Curve

■ **Package Information**

PDFN5×6



Dim.	Min.	Max.
A	4.8	5.2
B	0.25	0.35
C	1.0	1.2
C1	Typ 0.254	
C2	Typ 0.254	
E	Typ 1.27	
L	6.0	6.3
L1	5.7	6.0
L2	MAX 0.2	
R	Typ 13°	