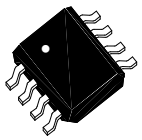
4407

P-Channel Enhancement-Mode MOSFET (-30V, -12A)

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(on)}$ (m-ohm) Max
-30V	-12A	13 @ V_{GS} = -20V ,ID=-10A
		20 @ V_{GS} = -10V ,ID=-10A
		28 @ V_{GS} = -5V ,ID=-10A

Features

- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Lead free product is acquired



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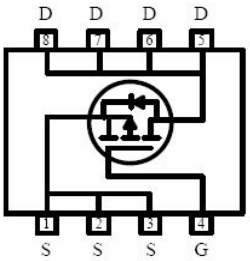

Pin 1 / 2 / 3: Source
Pin 4: Gate
Pin 5 / 6 / 7 / 8: Drain

Absolute Maximum Ratings (T_A=25°C, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current @T_A=25°C	-10	A
I_{DM}	Drain Current (Pulsed) [a]	-60	A
I_{AR}	Avalanche Current	30	A
E_{AR}	Repetitive Avalanche Energy L=0.3mH	135	mJ
P_D	Total Power Dissipation @T_A=25°C	3	W
	Total Power Dissipation @T_A=75°C	2.1	
I_S	Maximum Diode Forward Current	-2.1	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	°C
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (PCB mounted)[b]	50	°C/W

a: Repetitive Rating: Pulse width limited by the maximum junction temperation.
b: 1-in^2 2oz Cu PCB board

Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-24V, V_{GS}=0V	-	-	-1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±25V, V_{DS}=0V	-	-	±100	nA
• On Characteristics[c]						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-1.0	-	-3.0	V
$I_{DS(on)}$	On State Drain Current	V_{DS}=-5V, V_{GS}=-10V	60	-	-	A
$R_{DS(on)}$	Drain-Source On-State Resistance					mΩ
		V_{GS}=-10V, I_D=-10A	-	-	14	
		V_{GS}=-4.5V, I_D=-6A	-	-	20	
g_{FS}	Forward Transconductance	V_{DS}=-10V, I_D=-5A	-	26	-	S
• Dynamic Characteristics [d]						
C_{iss}	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz	-	2076	2500	pF
C_{oss}	Output Capacitance		-	503	-	
C_{rss}	Reverse Transfer Capacitance		-	302	423	
R_g	Gate Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz	1	2	3	Ω
• Switching Characteristics[d]						
Q_g	Total Gate Charge	V_{DS}=-15V, I_D=-12A, V_{GS}=-10V	-	37.2	-	nC
Q_{gs}	Gate-Source Charge		-	7	-	
Q_{gd}	Gate-Drain Charge		-	10.4	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-15V, R_L=1.25Ω, V_{GS}=-10V, R_G=3Ω	-	12.4	-	nS
t_r	Turn-on Rise Time		-	8.2	-	
$t_{d(off)}$	Turn-off Delay Time		-	25.6	-	
t_f	Turn-off Fall Time		-	12	-	
t_{rr}	Reverse Recovery Time	I_{DS}=-12A, dI/ dt=100A/ uS	-	33	40	nS
Q_{rr}	Reverse Recovery Charge		-	23	-	nC
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=-1A	-	-	-1	V
I_S	Drain-Source Diode Forward Current		-	-	-4.2	A

Note: Pulse Test: Pulse Width ≤300us, Duty Cycle≤2%

Characteristics Curve

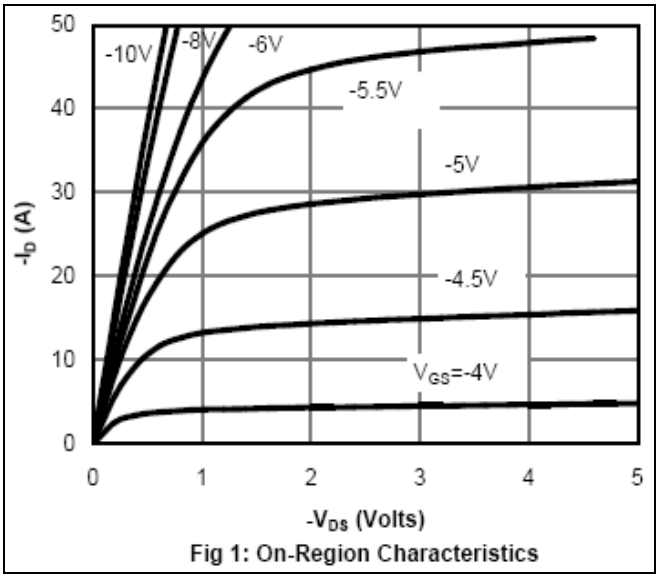

Fig 1: On-Region Characteristics

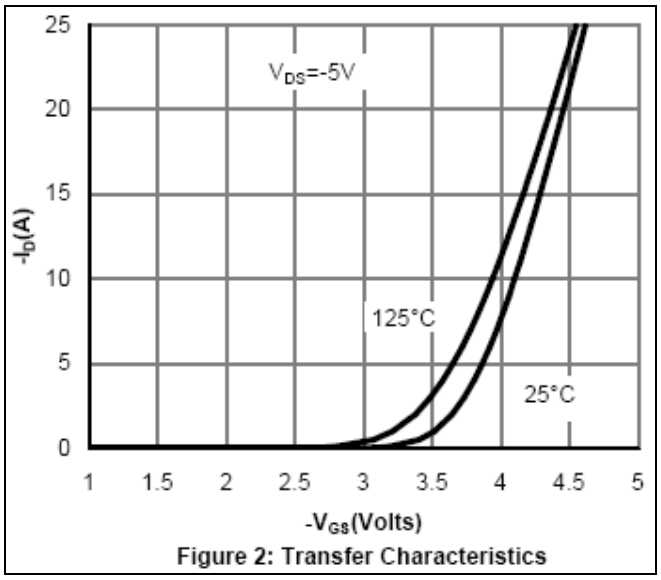

Figure 2: Transfer Characteristics

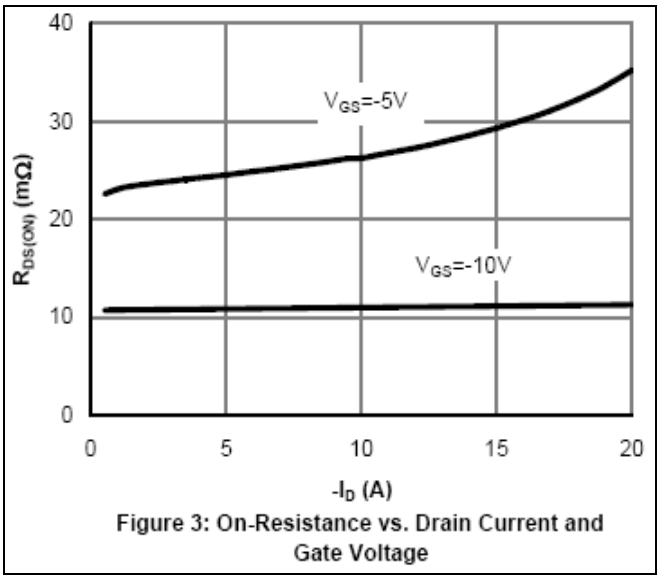

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

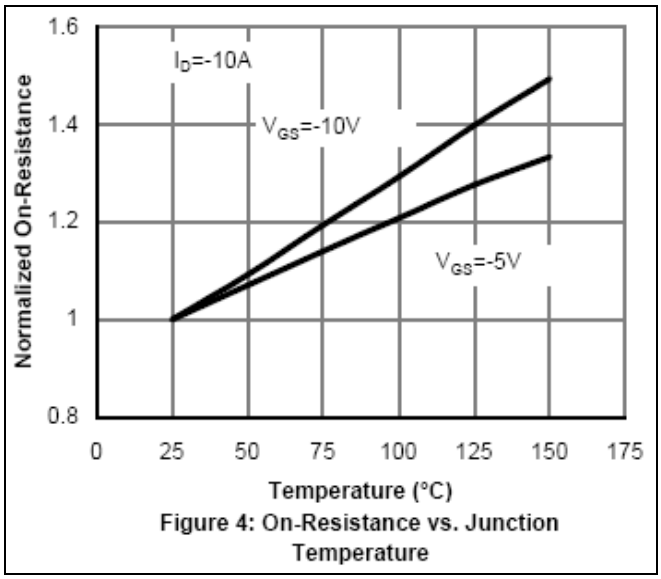

Figure 4: On-Resistance vs. Junction Temperature

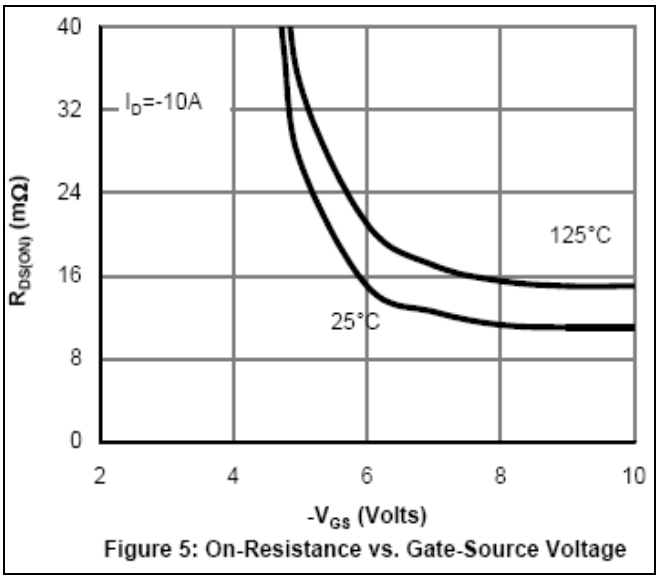

Figure 5: On-Resistance vs. Gate-Source Voltage

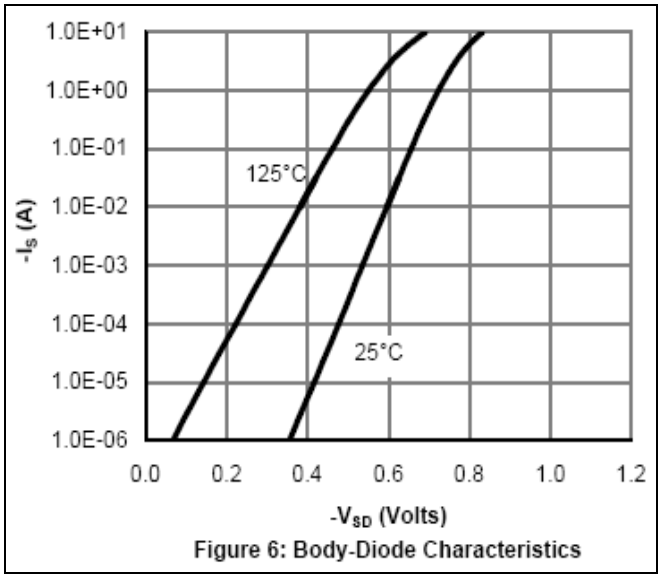

Figure 6: Body-Diode Characteristics

Characteristics Curve

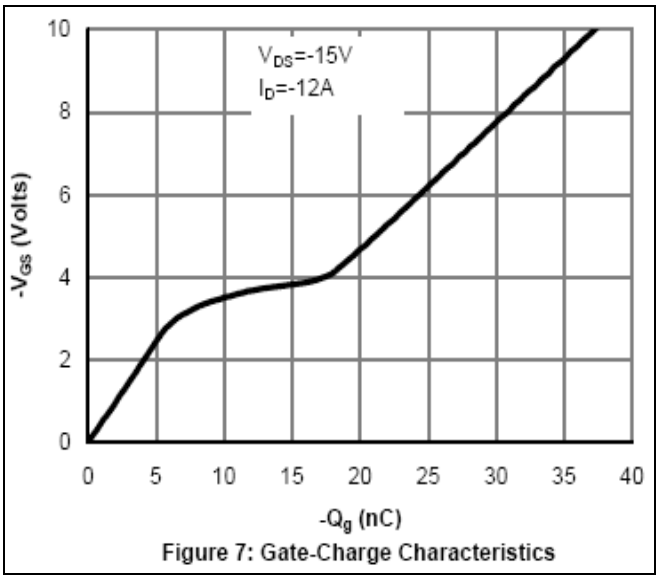

Figure 7: Gate-Charge Characteristics

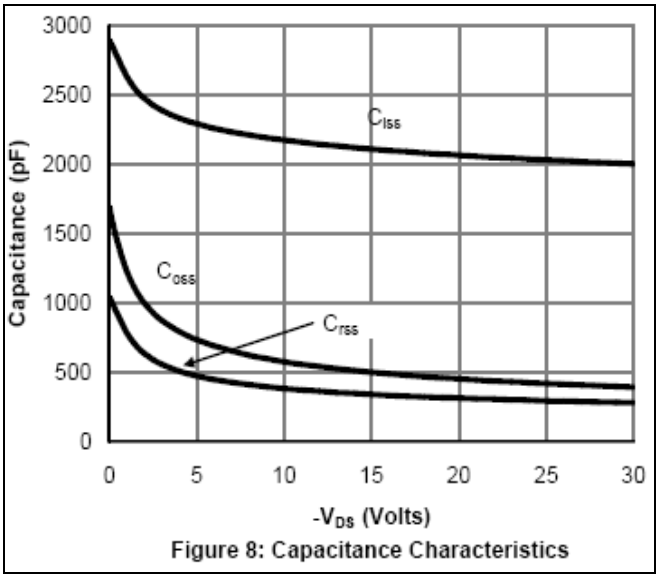

Figure 8: Capacitance Characteristics

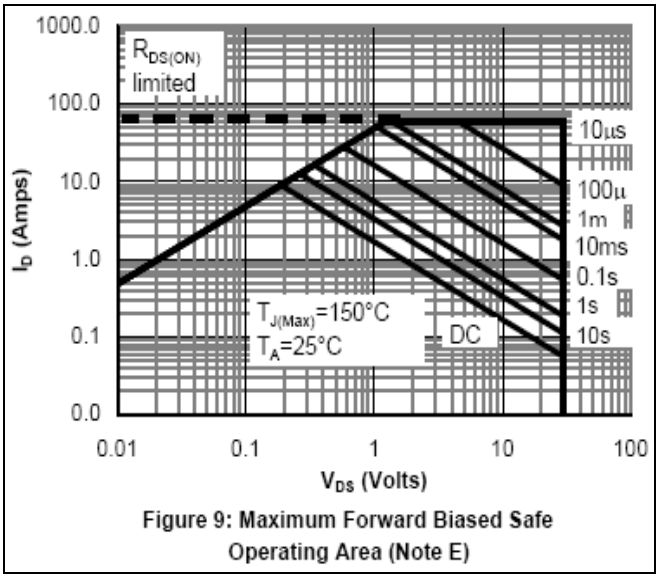

Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

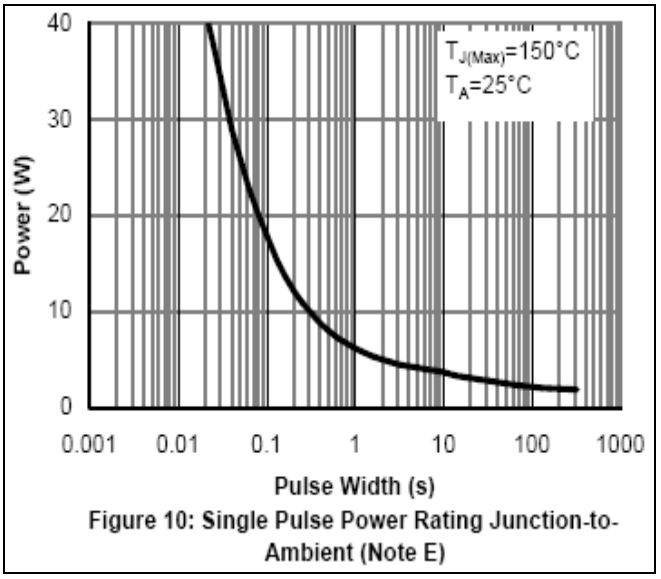

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

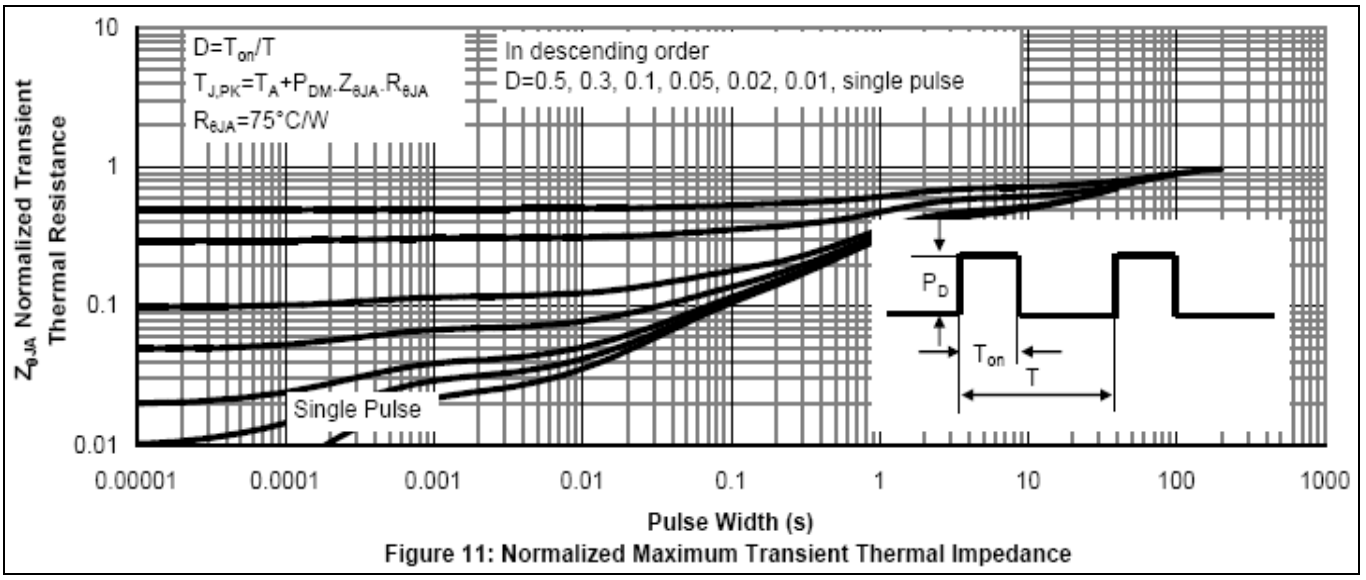

Figure 11: Normalized Maximum Transient Thermal Impedance