

General Description

The A07417/L uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.5V, in the small SOT363 footprint. This device is suitable for use in buck convertor. A07417 and A07417L are electrically identical.

-RoHS Compliant

-A07417L is Halogen Free

Features

$$V_{DS} (V) = -20V$$

$$I_D = -2 A \quad (V_{GS} = -4.5V)$$

$$R_{DS(ON)} < 80m\Omega \quad (V_{GS} = -4.5V)$$

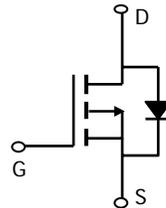
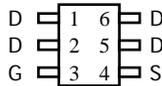
$$R_{DS(ON)} < 100m\Omega \quad (V_{GS} = -2.5V)$$

$$R_{DS(ON)} < 125m\Omega \quad (V_{GS} = -1.8V)$$

$$R_{DS(ON)} < 150m\Omega \quad (V_{GS} = -1.5V)$$



SC-70-6
(SOT-363)
Top View



Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted

Parameter	Symbol	10 Sec	Steady State	Units
Drain-Source Voltage	V_{DS}		-20	V
Gate-Source Voltage	V_{GS}		± 8	V
Continuous Drain Current ^A	I_D	$T_A=25^\circ C$	-2	A
		$T_A=70^\circ C$	-1.7	
Pulsed Drain Current ^B	I_{DM}		-20	
Power Dissipation ^A	P_D	$T_A=25^\circ C$	0.63	W
		$T_A=70^\circ C$	0.4	
Junction and Storage Temperature Range	T_J, T_{STG}		-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A $t \leq 10s$	$R_{\theta JA}$	160	200	$^\circ C/W$
Maximum Junction-to-Ambient ^A Steady-State		180	220	$^\circ C/W$
Maximum Junction-to-Lead ^C Steady-State	$R_{\theta JL}$	130	160	$^\circ C/W$

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =-250μA, V _{GS} =0V	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V T _J =55°C			-1 -5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±8V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.5	-0.65	-1	V
I _{D(ON)}	On state drain current	V _{GS} =-4.5V, V _{DS} =-5V	-20			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-2A T _J =125°C		65 90	80 110	mΩ
		V _{GS} =-2.5V, I _D =-1.8A		80	100	mΩ
		V _{GS} =-1.8V, I _D =-1.5A		100	125	mΩ
		V _{GS} =-1.5V, I _D =-0.5A		115	150	mΩ
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-2A		10		S
V _{SD}	Diode Forward Voltage	I _S =-1A, V _{GS} =0V		-0.7	-1	V
I _S	Maximum Body-Diode Continuous Current				-1	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, f=1MHz		560	745	pF
C _{oss}	Output Capacitance		80		pF	
C _{rss}	Reverse Transfer Capacitance		70		pF	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		15	23	Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-2A		8.5	11	nC
Q _{gs}	Gate Source Charge		1.2		nC	
Q _{gd}	Gate Drain Charge		2.1		nC	
t _{D(on)}	Turn-On DelayTime	V _{GS} =-4.5V, V _{DS} =-10V, R _L =5Ω, R _{GEN} =6Ω		7.2		ns
t _r	Turn-On Rise Time		36		ns	
t _{D(off)}	Turn-Off DelayTime		53		ns	
t _f	Turn-Off Fall Time		56		ns	
t _{rr}	Body Diode Reverse Recovery Time	I _F =-2A, dI/dt=100A/μs		37	49	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-2A, dI/dt=100A/μs		27		nC

A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any a given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

C. The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

D. The static characteristics in Figures 1 to 6 are obtained using 300 μs pulse width, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

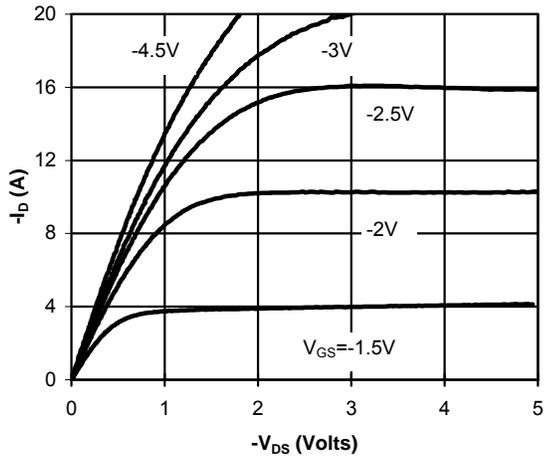


Fig 1: On-Region Characteristics

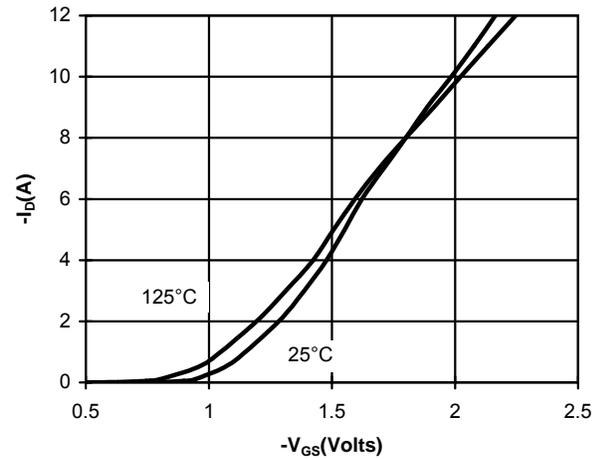


Figure 2: Transfer Characteristics

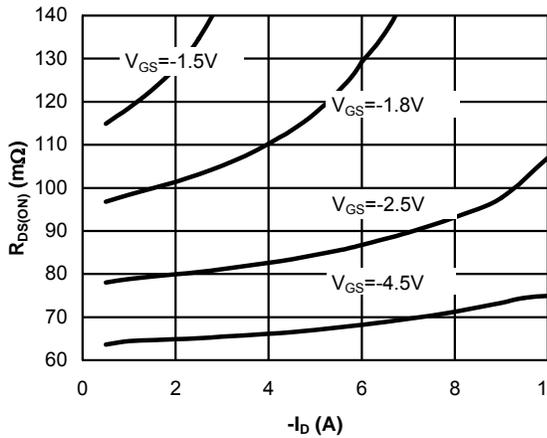


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

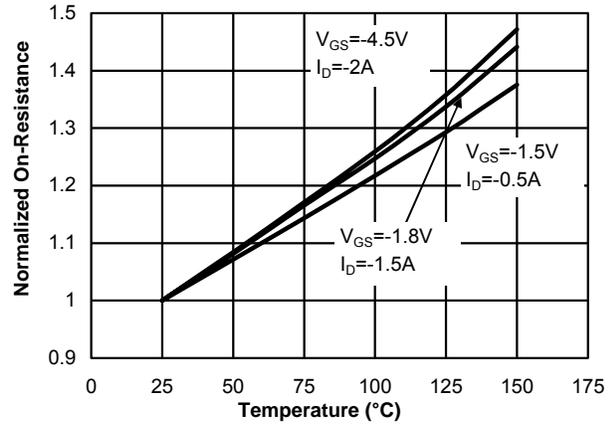


Figure 4: On-Resistance vs. Junction Temperature

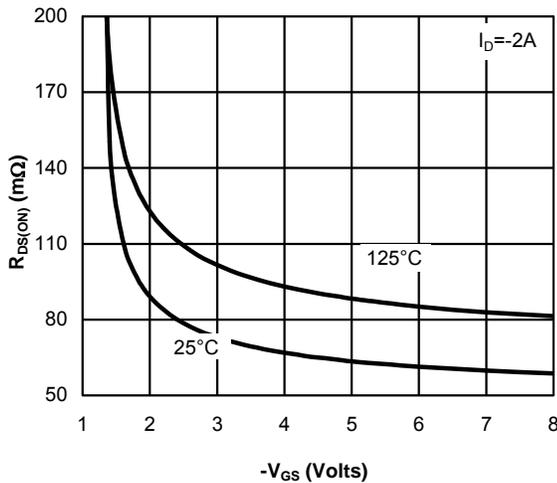


Figure 5: On-Resistance vs. Gate-Source Voltage

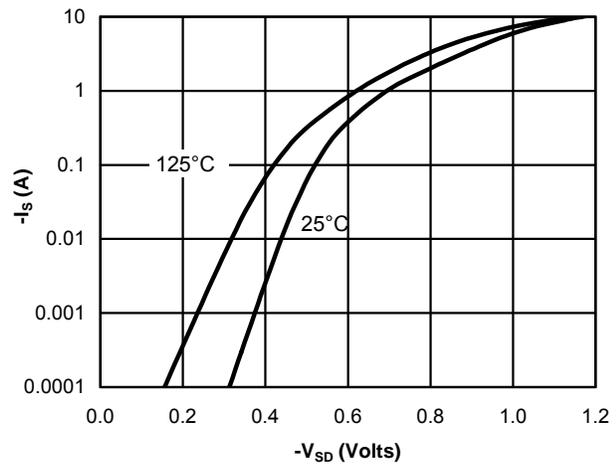


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

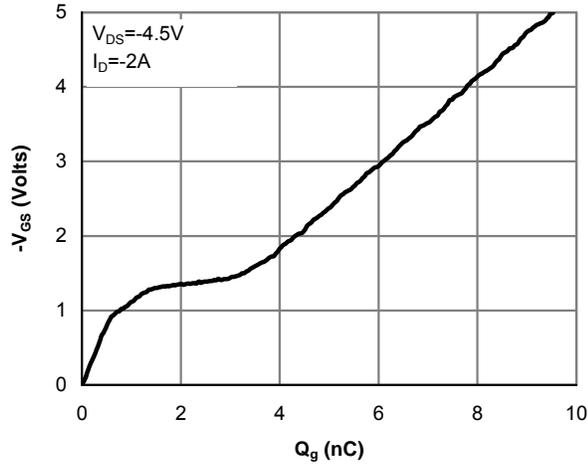


Figure 7: Gate-Charge Characteristics

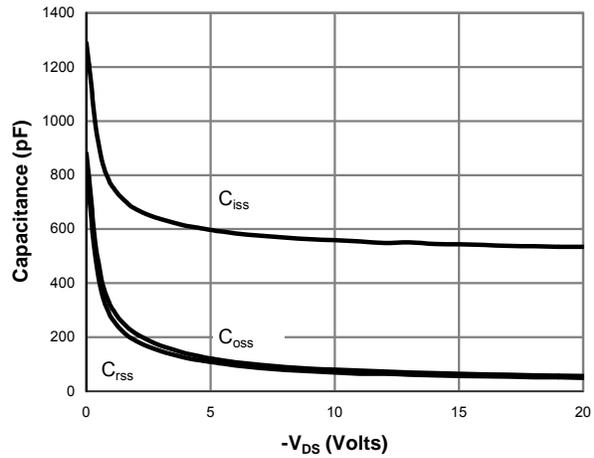


Figure 8: Capacitance Characteristics

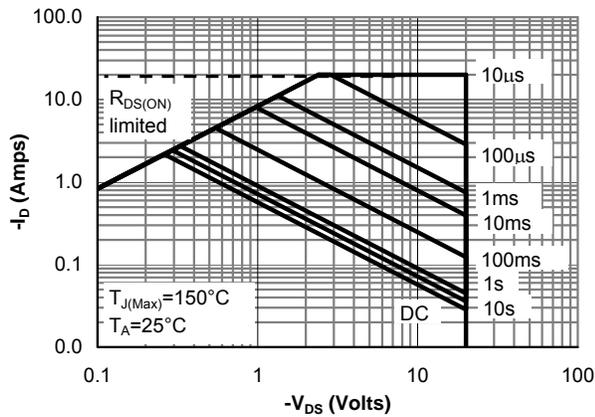


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

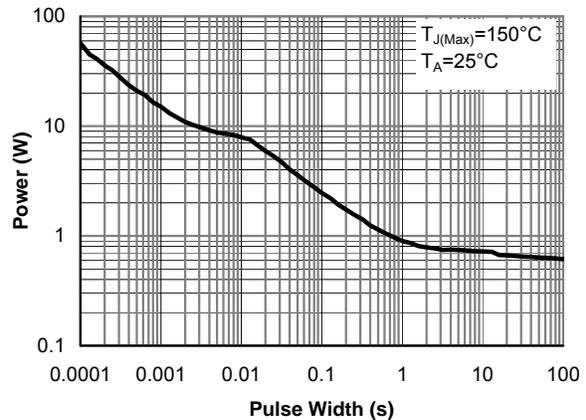


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

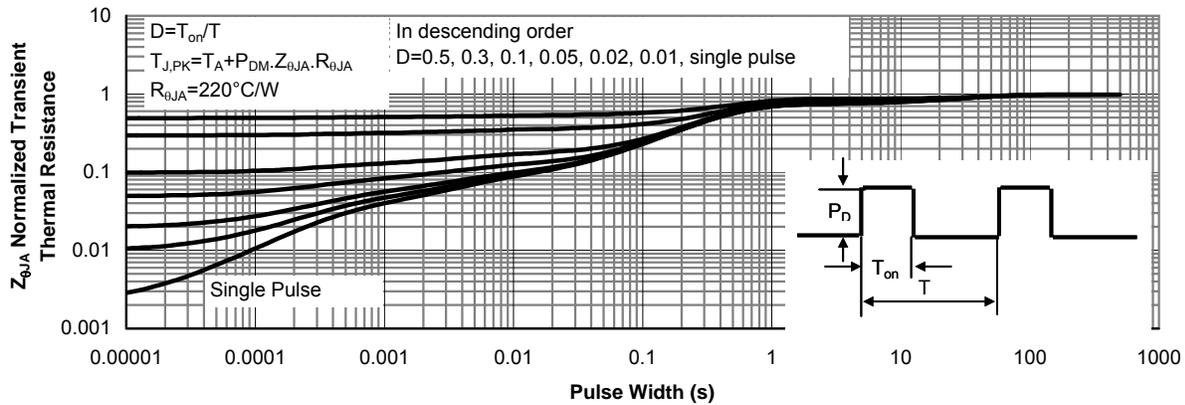


Figure 11: Normalized Maximum Transient Thermal Impedance