



T3SNAR070



1700V SiC MOSFETs

General Description

The 1700V SiC MOSFETs has been especially tailored to minimize on-state resistance, provide superior switching performance, higher system efficiency, and faster operating frequency. These devices are well suited for high efficiency fast switching applications.

BV_{DSS}	$R_{DS(ON)}$	I_D
1700 V	70 mΩ	70 A

Features

- $R_{DS(ON)} \leq 70\text{m}\Omega @ V_{GS}=20\text{V}$
- Low On-Resistance
- High Speed Switching
- Green Device Available

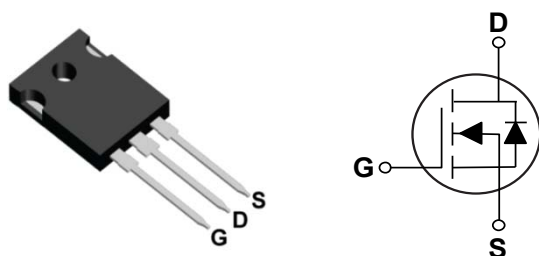
Benefits

- Lower Capacitance
- Higher System Efficiency
- Easy to Parallel

Applications

- Solar Inverters
- Switch Mode Power Supplies, UPS
- High Voltage DC/DC Converters
- Motor Drives

TO-247-3L Pin Configuration



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	1700	V
$V_{GS(max)}$	Gate-Source Voltage	-10 / +25	V
$V_{GS(op)}$	Gate-Source Voltage (Recommended Operational Values)	-5 / +20	V
I_D	Drain Current – Continuous ($T_C=25^\circ\text{C}$)	70	A
	Drain Current – Continuous ($T_C=100^\circ\text{C}$)	45	A
I_{DM}	Drain Current – Pulsed (NOTE 1)	140	A
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
Marking Code		SNAR070	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	40	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	0.37	$^\circ\text{C/W}$

**T3SNAR070****1700V SiC MOSFETs****Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)****Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=100\mu A$	1700	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=1700V$, $V_{GS}=0V$	---	---	100	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=20V$, $V_{DS}=0V$	---	---	200	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=20V$, $I_D=40A$	---	45	70	m Ω
		$V_{GS}=20V$, $I_D=40A$, $T_J=150^{\circ}\text{C}$	---	90	---	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=10mA$	2.0	---	4.0	V
		$V_{GS}=V_{DS}$, $I_D=10mA$, $T_J=150^{\circ}\text{C}$	---	1.75	---	

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	$V_{DD}=800V$, $V_{GS}= -5/+20V$, $I_D=40A$	---	260	---	nC
Q_{gs}	Gate-Source Charge		---	80	---	
Q_{gd}	Gate-Drain Charge		---	74	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=1200V$, $R_{G(EXT)}=2.5\Omega$, $I_D=40A$, $V_{GS}= -5/+20V$	---	60	---	nS
T_r	Rise Time		---	140	---	
$T_{d(off)}$	Turn-Off Delay Time		---	50	---	
T_f	Fall Time		---	42	---	
$E_{(on)}$	Turn-On Energy	$V_{DD}=1200V$, $I_D=40A$, $V_{GS}= -5/+20V$, $R_{G(EXT)}=2.5\Omega$	---	4	---	mJ
$E_{(off)}$	Turn-Off Energy		---	1.8	---	
C_{iss}	Input Capacitance	$V_{DS}=1000V$, $V_{GS}=0V$, $F=1MHz$	---	6000	---	pF
C_{oss}	Output Capacitance		---	240	---	
C_{rss}	Reverse Transfer Capacitance		---	30	---	
$R_{G(int)}$	Internal Gate Resistance	$V_{GS}=0V$, $V_{DS}=0V$, $F=1MHz$	---	1	---	Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Body Diode Current		---	---	70	A
V_{SD}	Diode Forward Voltage	$V_{GS}= -5V$, $I_S=20A$	---	3.3	---	V
		$V_{GS}= -5V$, $I_S=20A$, $T_J=150^{\circ}\text{C}$	---	3.1	---	V
t_{rr}	Reverse Recovery Time	$V_{GS}= -5V$, $I_F=20A$, $V_R=1200V$, $di/dt=1200A/\mu s$	---	95	---	nS
Q_{rr}	Reverse Recovery Charge		---	340	---	nC
I_{RRM}	Peak Reverse Recovery Current		---	16	---	A

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.



Typical Performance

FIG. 1- I_D vs T_C

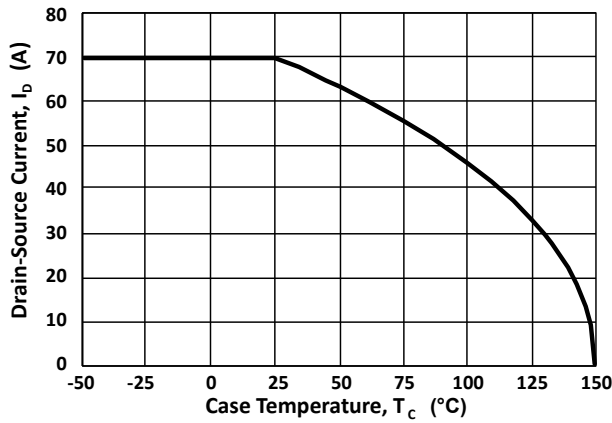


FIG. 2- P_D vs T_C

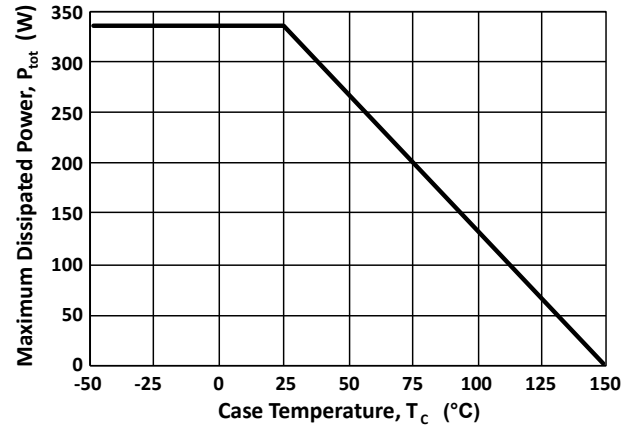


FIG. 3-Transient Thermal Impedance

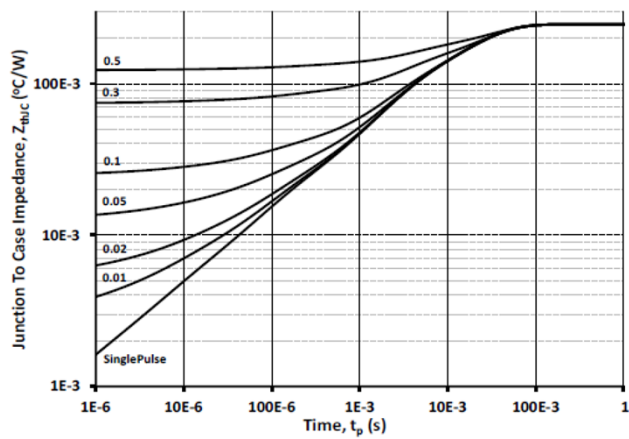
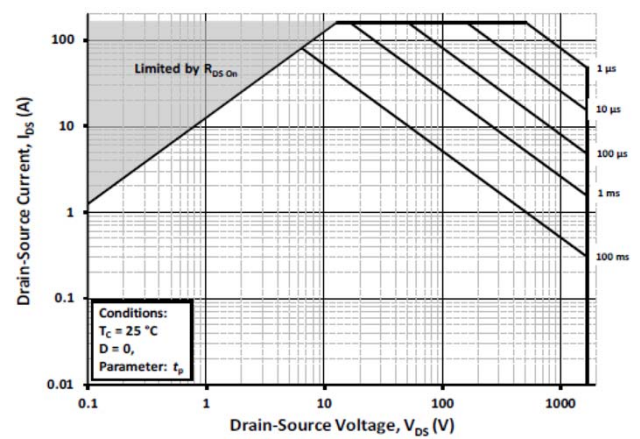


FIG. 4-Safe Operating Area



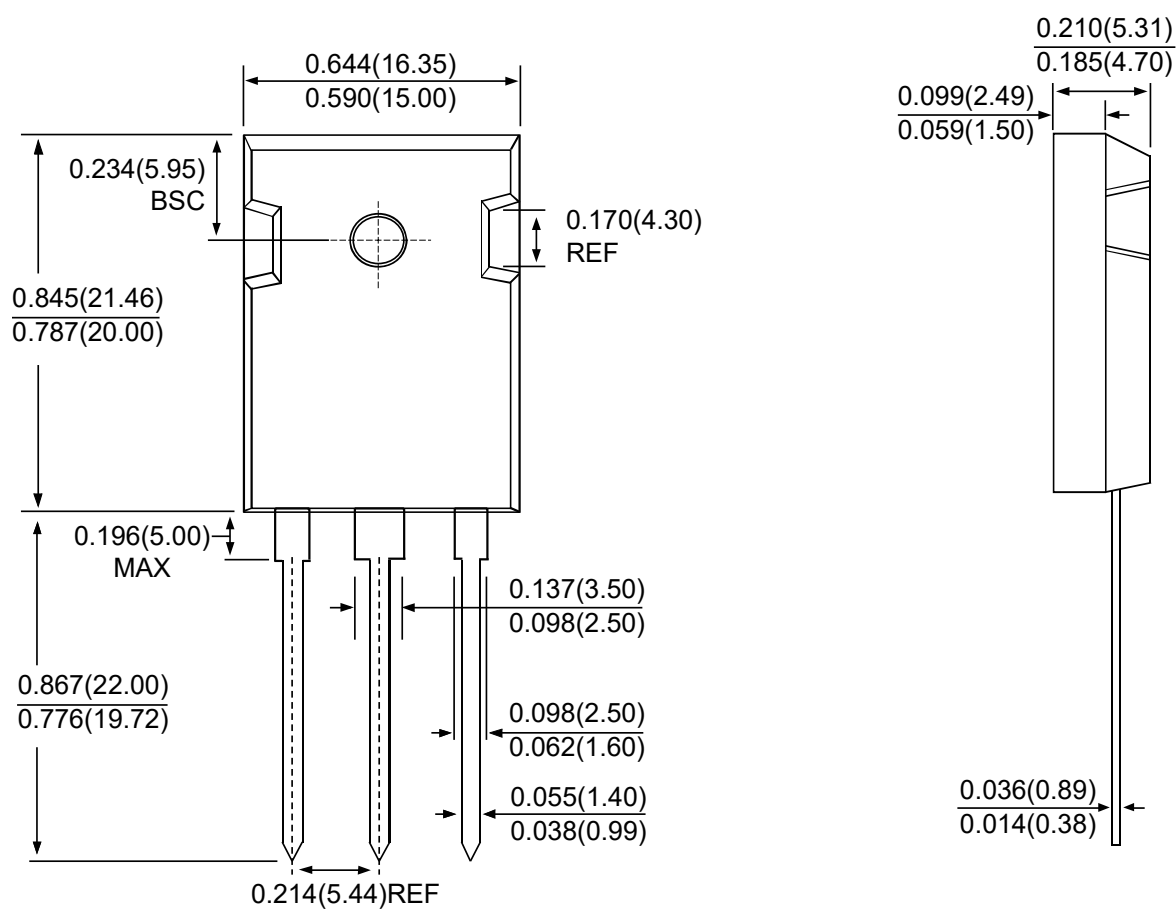


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Package Outline Dimensions



TO-247-3L

Dimensions in inches and (millimeters)



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