



# BSS127

*Power MOSFET*

## 0.021A, 600V ENHANCEMENT N-CHANNEL MOSFET

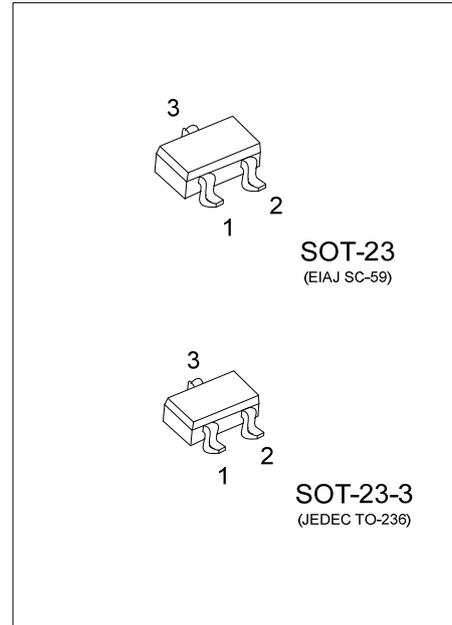
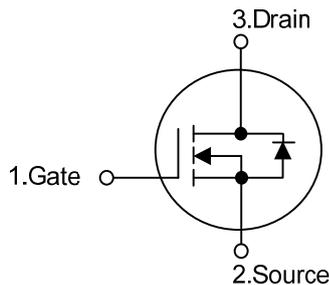
■ DESCRIPTION

The UTC **BSS127** is an enhancement N-channel mode Power FET, it uses UTC's advanced technology to provide customers ultra high switching speed and ultra low gate charge.

■ FEATURES

- \*  $R_{DS(ON)} \leq 600\Omega @ V_{GS}=4.5V, I_D=0.016A$
- $R_{DS(ON)} \leq 500\Omega @ V_{GS}=10V, I_D=0.016A$
- \* Ultra Low Gate Charge (Typical 140nC)
- \* Ultra High Switching Speed

■ SYMBOL



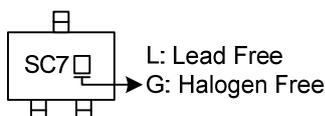
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
BSS127L-AE2-R	BSS127G-AE2-R	SOT-23-3	G	S	D	Tape Reel
BSS127L-AE3-R	BSS127G-AE3-R	SOT-23	G	S	D	Tape Reel

Note: Pin Assignment: G: Gate S: Source D: Drain

<p>BSS127G-AE2-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) R: Tape Real</p> <p>(2) AE2: SOT-23-3, AE3: SOT-23</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		$V_{DSS}$	600	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V	
Drain Current	Continuous	$I_D$	$T_A=25^\circ\text{C}$	0.021	A
			$T_A=70^\circ\text{C}$	0.017	A
	Pulsed ( $T_A=25^\circ\text{C}$ )	$I_{DM}$	0.09	A	
Peak Diode Recovery dv/dt		dv/dt	6	kV/ $\mu\text{s}$	
Power Dissipation ( $T_A=25^\circ\text{C}$ )		$P_D$	0.3	W	
Junction Temperature		$T_J$	-55 ~ +150	$^\circ\text{C}$	
Storage Temperature Range		$T_{STG}$	-55 ~ +150	$^\circ\text{C}$	

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL CHARACTERISTICS

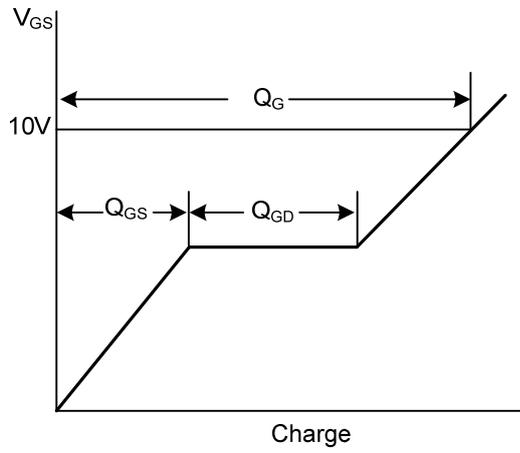
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	325	$^\circ\text{C/W}$

■ ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>							
Drain-Source Breakdown Voltage		$BV_{DSS}$	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	600			V
Gate-Source Leakage Current	Forward	$I_{GSS}$	$V_{GS}=+20\text{V}, V_{DS}=0\text{V}$		+10	+100	nA
	Reverse		$V_{GS}=-20\text{V}, V_{DS}=0\text{V}$		-10	-100	nA
Drain-Source Leakage Current		$I_{D(OFF)}$	$V_{GS}=0\text{V}, V_{DS}=600\text{V}, T_J=25^\circ\text{C}$			0.1	$\mu\text{A}$
			$V_{GS}=0\text{V}, V_{DS}=600\text{V}, T_J=150^\circ\text{C}$			10	$\mu\text{A}$
<b>ON CHARACTERISTICS</b>							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=8\mu\text{A}$	1.4	2.0	2.6	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=4.5\text{V}, I_D=0.016\text{A}$		330	600	$\Omega$
			$V_{GS}=10\text{V}, I_D=0.016\text{A}$		310	500	$\Omega$
Forward Transconductance		$g_{FS}$	$ V_{DS} >2 I_D R_{DS(ON)MAX}, I_D=0.01\text{A}$	0.007	0.015		S
<b>DYNAMIC PARAMETERS</b>							
Input Capacitance		$C_{ISS}$	$V_{GS}=0\text{V}, V_{DS}=25\text{V}, f=1.0\text{MHz}$		21	28	pF
Output Capacitance		$C_{OSS}$			2.4	3	pF
Reverse Transfer Capacitance		$C_{RSS}$			1.0	1.5	pF
<b>SWITCHING PARAMETERS</b>							
Total Gate Charge		$Q_G$	$V_{GS}=0\sim 10\text{V}, V_{DS}=300\text{V}, I_D=0.01\text{A}$		0.07	0.10	nC
Gate to Source Charge		$Q_{GS}$			0.31	0.5	nC
Gate to Drain Charge		$Q_{GD}$			0.65	1.0	nC
Gate Plateau Voltage		$V_{plateau}$			3.56		V
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=300\text{V}, V_{GS}=10\text{V}, I_D=0.01\text{A}, R_G=6\Omega$		6.1	19.0	ns
Rise Time		$t_R$			9.7	14.5	ns
Turn-OFF Delay Time		$t_{D(OFF)}$			14	21	ns
Fall-Time		$t_F$			115	170	ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>							
Maximum Continuous Drain-Source Diode Forward Current		$I_S$	$T_A=25^\circ\text{C}$			0.016	A
Maximum Pulsed Drain-Source Diode Forward Current		$I_{SM}$	$T_A=25^\circ\text{C}$			0.09	A
Drain-Source Diode Forward Voltage		$V_{SD}$	$I_F=0.016\text{A}, V_{GS}=0\text{V}, T_J=25^\circ\text{C}$		0.82	1.2	V
Body Diode Reverse Recovery Time		$t_{rr}$	$V_R=300\text{V}, I_F=0.016\text{A}$		160	240	ns
Body Diode Reverse Recovery Charge		$Q_{rr}$	$dI_F/dt=100\text{A}/\mu\text{s}$		13.2	19.8	$\mu\text{C}$

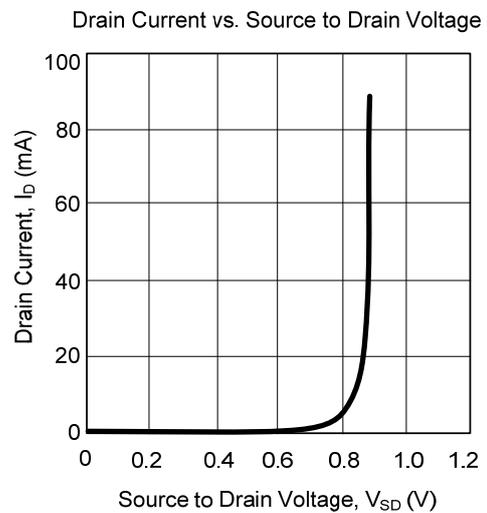
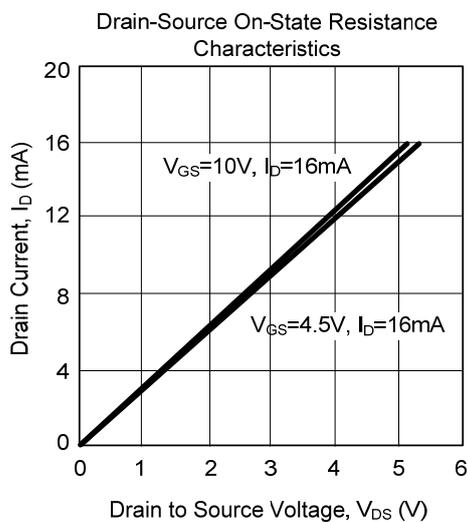
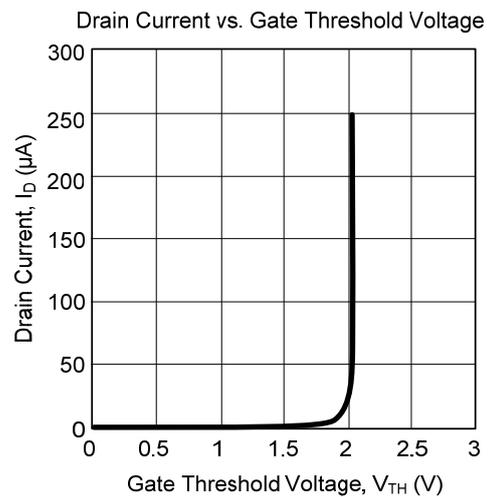
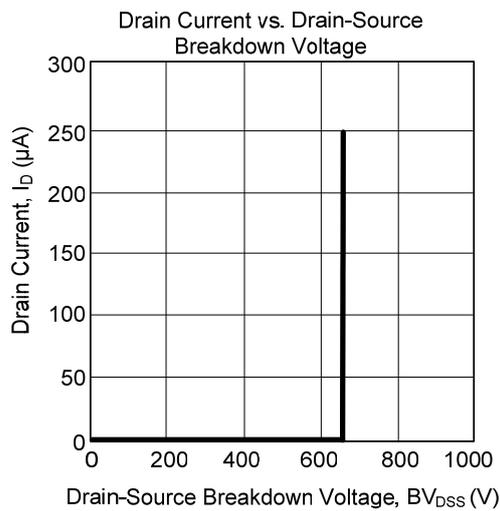
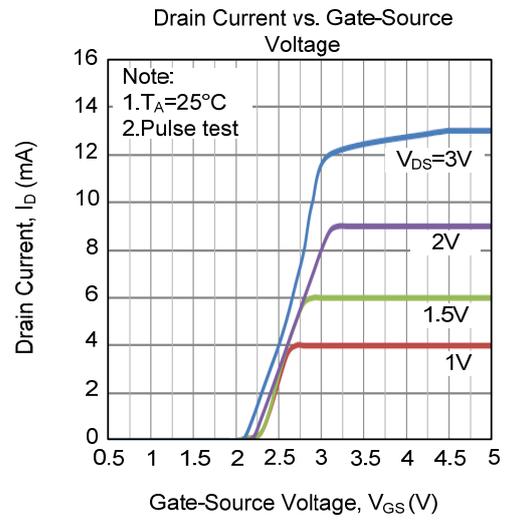
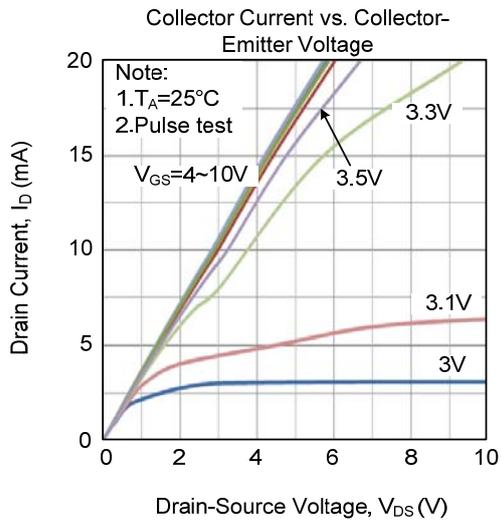
Notes: 1. The Power Dissipation of the package may result in a lower continuous drain current.  
2. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

■ TEST CIRCUITS AND WAVEFORMS



Gate Charge Waveforms

## TYPICAL CHARACTERISTICS



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.