



## Description

The SSM3K333R,LF(T uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

## General Features

$V_{DS} = 30V$   $I_D = 5.8A$

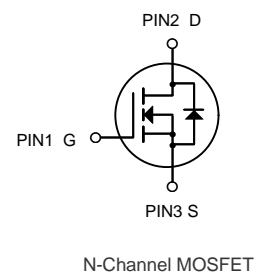
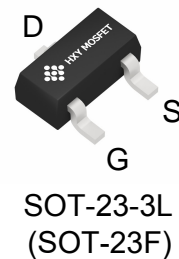
$R_{DS(ON)} < 28m\Omega @ V_{GS}=10V$

## Application

Battery protection

Load switch

Uninterruptible power supply



## Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
SSM3K333R,LF(T	SOT-23-3L(SOT-23F)	HXY MOSFET	3000

## Absolute Maximum Ratings (TA=25°C unless otherwise noted)

symbol	parameter	limit	unit
$V_{DS}$	Drain-source voltage	30	V
$V_{GS}$	Gate-source voltage	$\pm 20$	V
$I_D$	Drain current-continuous <sup>a</sup> @Tj=125°C -pulse <sup>d</sup>	5.8	A
$I_{DM}$		20	A
$I_S$	Drain-source Diode forward current	5.8	A
$P_D$	Maximum power dissipation	1.4	W
$T_j$	Operating junction Temperature range	-55—150	°C
$R_{th JA}$	Thermal Resistance junction-to ambient	100	°C/W



**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero gate voltage drain current	$IDSS$	$V_{DS}=30V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-body leakage	$IGSS$	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.8	1.4	2.2	V
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=5A$	-	24	28	m $\Omega$
		$V_{GS}=4.5V, I_D=4A$		26	32	
Forward transconductance	$g_{fs}$	$V_{GS}=5V, I_D=5A$	-	33	-	S
Input capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V$ $f=1.0MHz$		255		pF
Output capacitance	$COSS$			45		
Reverse transfer capacitance	$CRSS$			35		
Turn-on delay time	$t_{D(ON)}$	$V_{DS}=15V, V_{GS}=10V$ $R_L=2.6\text{ ohm}$ $R_{GEN}=3\text{ohm}$	-	4.5	-	ns
Rise time	$t_r$		-	2.5	-	
Turn-off delay time	$t_{D(OFF)}$		-	14.5	-	
Fall time	$t_f$		-	3.5	-	
Total gate charge	$Q_g$	$V_{DS}=15V, I_D=5.8A$ $V_{GS}=10V$	-	5.2	-	nC
Gate-source charge	$Q_{gs}$		-	0.85	-	
Gate-drain charge	$Q_{gd}$		-	1.3	-	
Diode forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A$	-	0.76	1.16	V

**Notes:**

- 1、surface mounted on FR4 board,  $t \leq 10\text{sec}$
- 2、pulse test: pulse width  $\leq 300\mu s$ , duty  $\leq 2\%$
- 3、guaranteed by design, not subject to production testing



## Typical Performance Characteristics

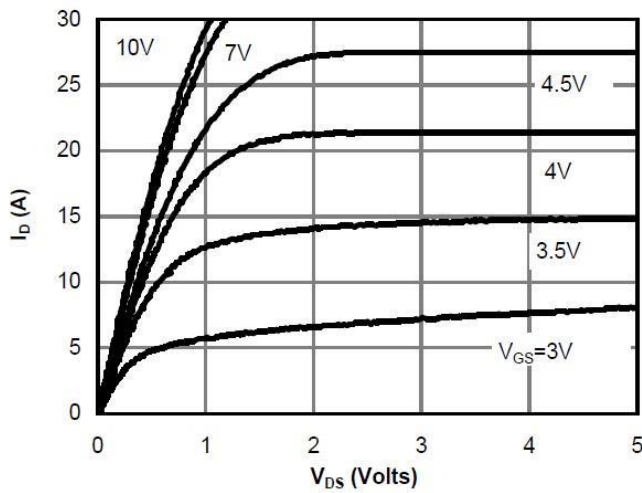


Fig 1: On-Region Characteristics

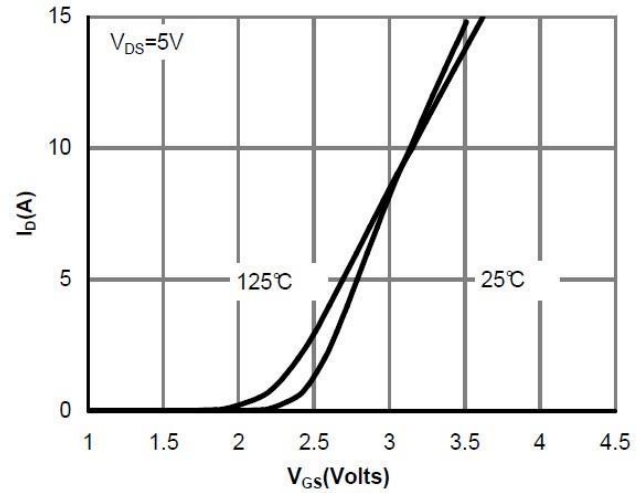


Figure 2: Transfer Characteristics

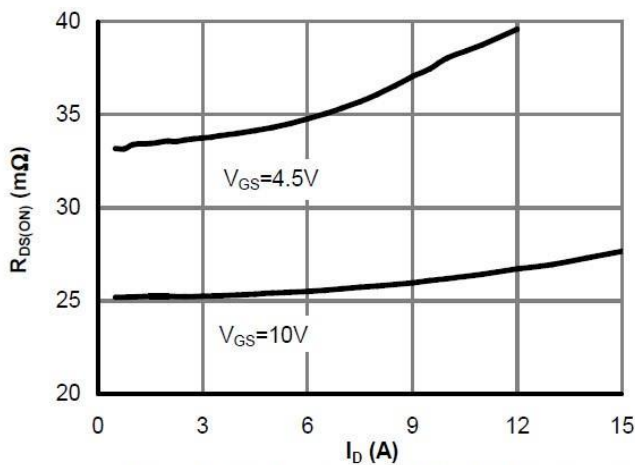


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

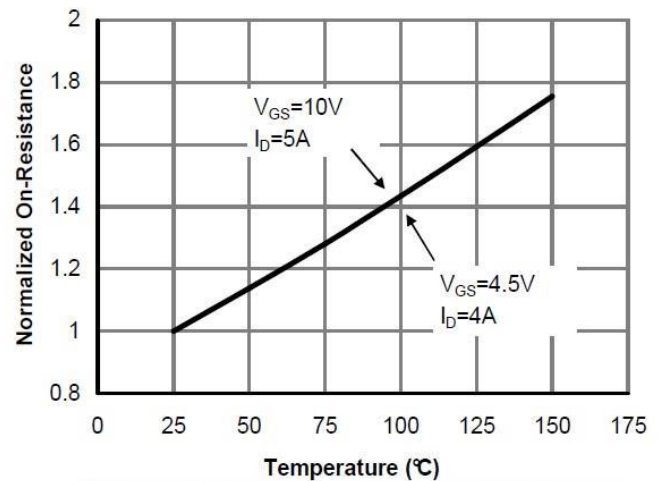


Figure 4: On-Resistance vs. Junction Temperature

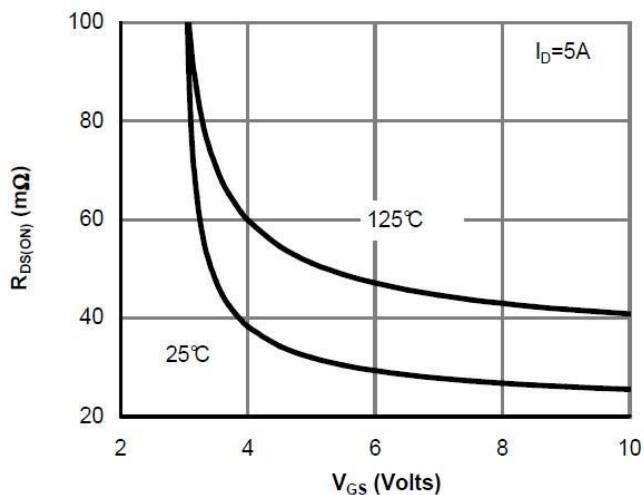


Figure 5: On-Resistance vs. Gate-Source Voltage

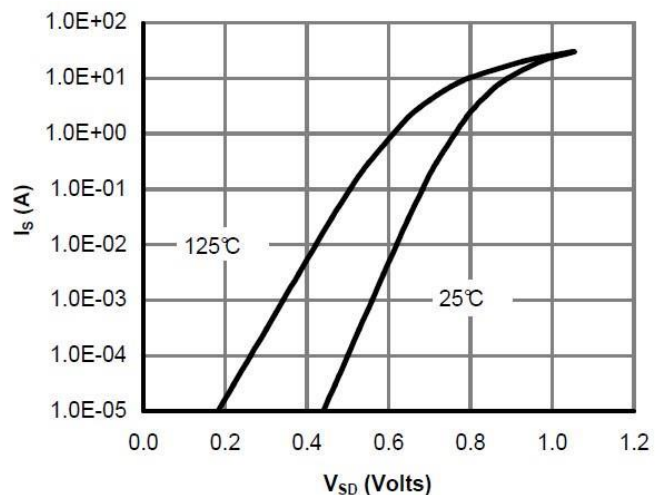


Figure 6: Body-Diode Characteristics

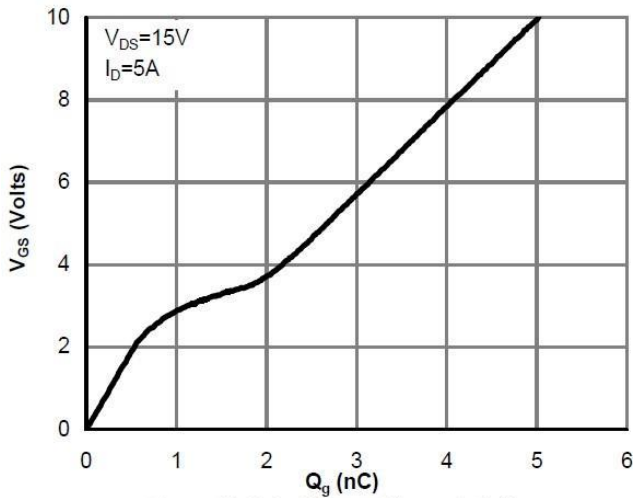


Figure 7: Gate-Charge Characteristics

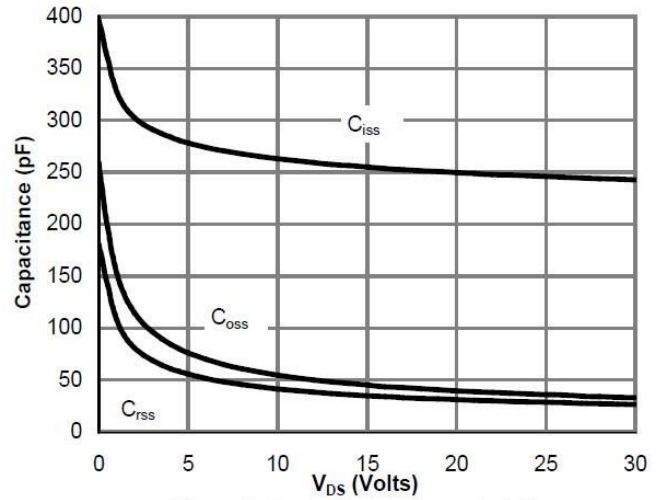


Figure 8: Capacitance Characteristics

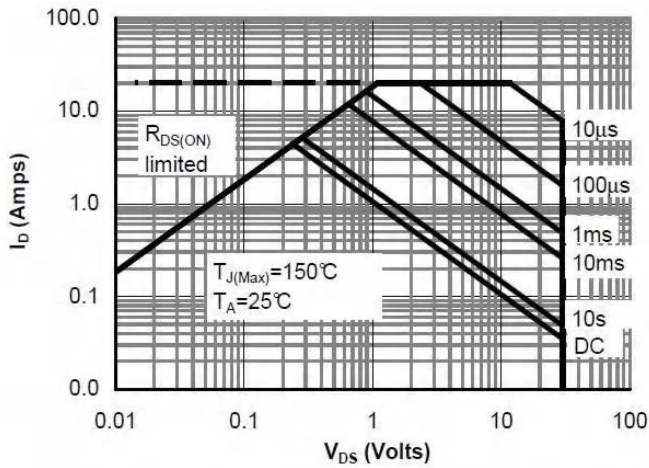


Figure 10: Maximum Forward Biased Safe Operating Area

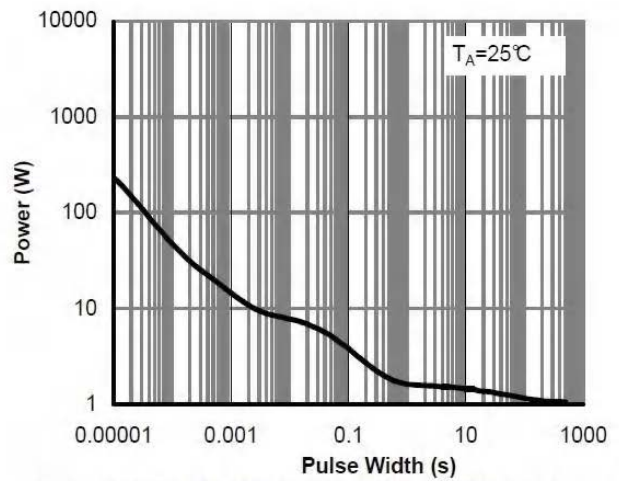


Figure 11: Single Pulse Power Rating Junction-to-Ambient

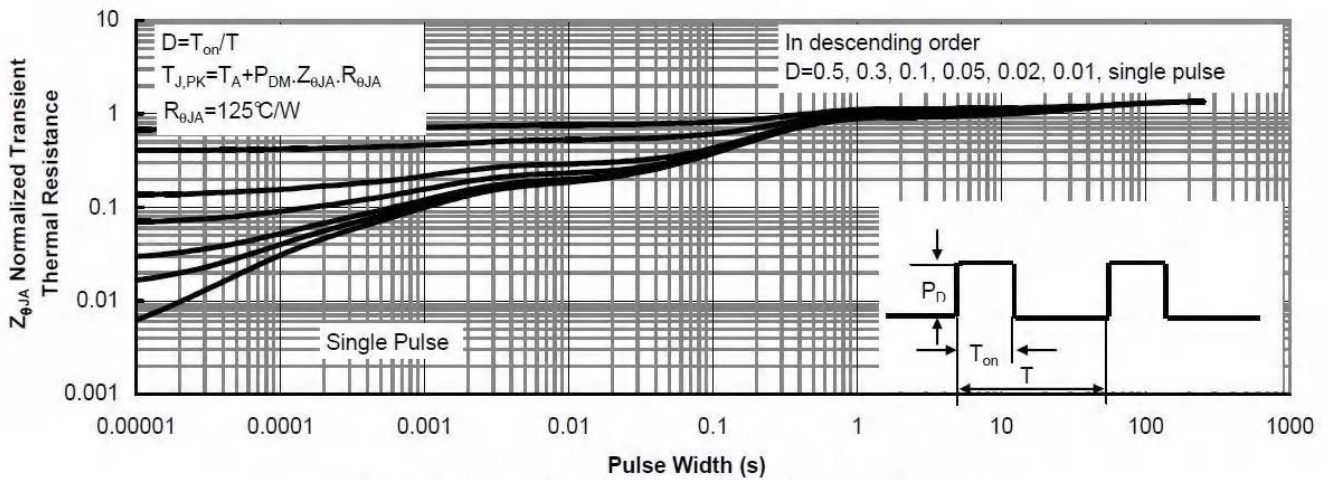
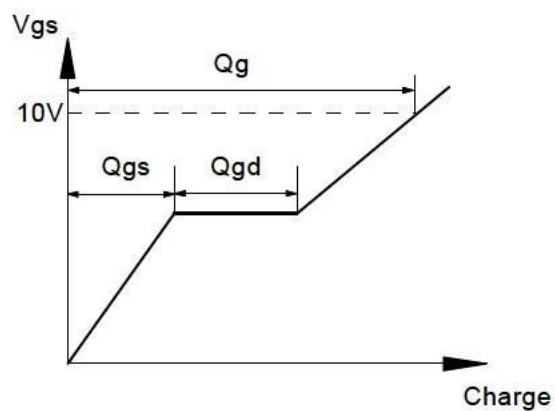
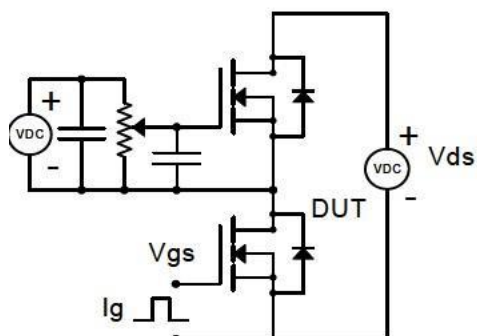


Figure 12: Normalized Maximum Transient Thermal Impedance

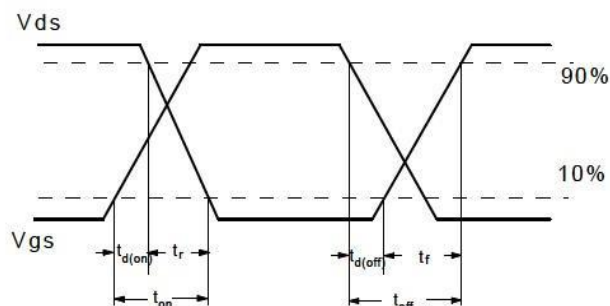
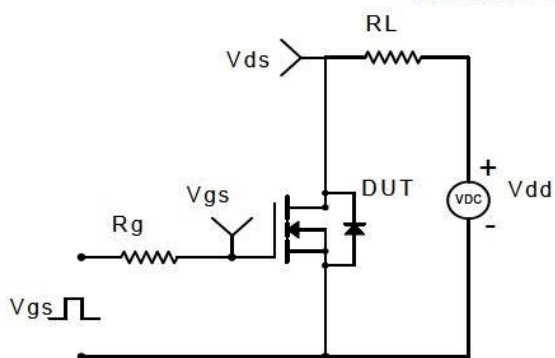


### Gate Charge Test Circuit & Waveform

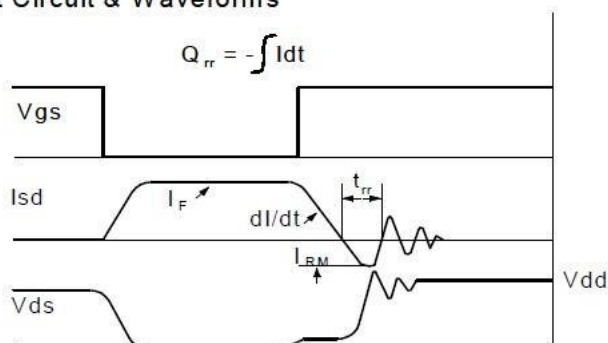
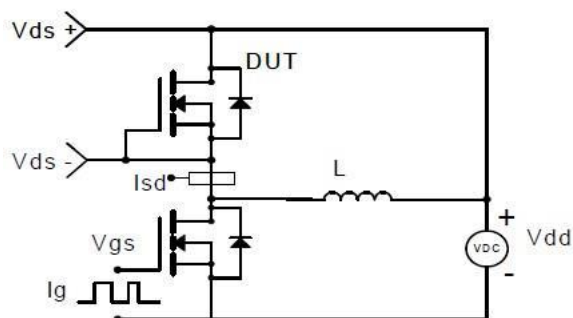


### Resistive Switching Test Circuit & Waveforms

#### Resistive Switching Test Circuit & Waveforms

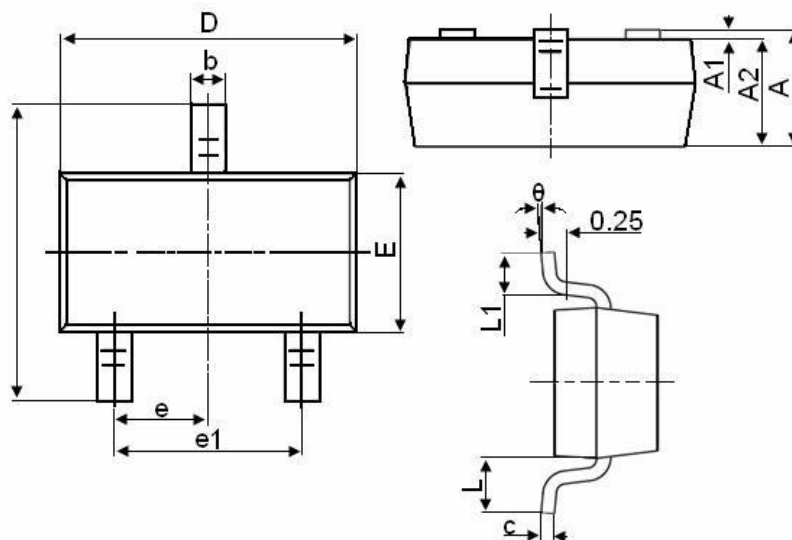


### Diode Recovery Test Circuit & Waveforms





## SOT-23-3L(SOT-23F) Package Information



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.800	3.000
E	1.500	1.700
E1	2.650	2.950
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.600
θ	0°	8°



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