



CT3A01-R3

N-Channel Enhancement MOSFET

Features

- Drain-Source Breakdown Voltage V_{DS} 20 V
- Drain-Source On-Resistance
- $R_{DS(ON)}$ 55m Ω , at V_{GS} = 4.5V, I_D =3.2A
 $R_{DS(ON)}$ 65m Ω , at V_{GS} = 2.5V, I_D = 2.5A
 $R_{DS(ON)}$ 80m Ω , at V_{GS} = 1.8V, I_D = 2.0A
- Continuous Drain Current at T_A =25°C I_D = 3.2A
- Advanced high cell density Trench Technology
- RoHS Compliance & Halogen Free

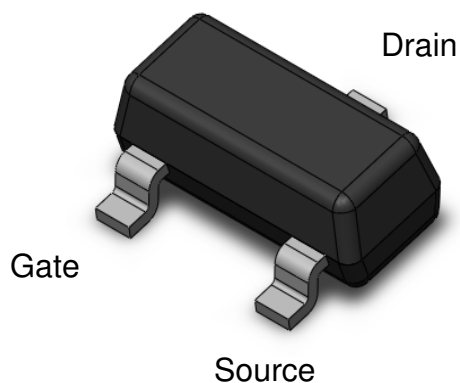
Description

The CT3A01-R3 uses high performance Trench Technology to provide excellent $R_{DS(ON)}$ and low gate charge which is suitable for most of the synchronous buck converter applications.

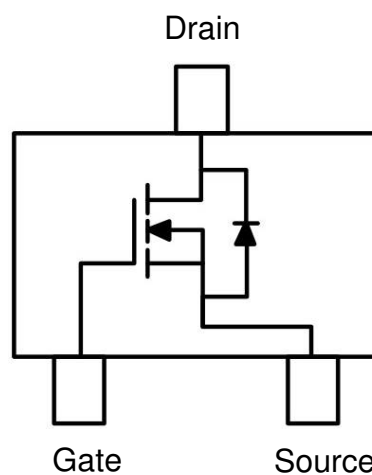
Applications

- Power Management
- Portable Equipment
- Load switch

Package Outline



Schematic



**CT3A01-R3****N-Channel Enhancement MOSFET****Absolute Maximum Rating at 25°C**

Symbol	Parameters	Test Conditions	Min	Notes
V _{DS}	Drain-Source Voltage	20	V	
V _{GS}	Gate-Source Voltage	±8	V	
I _D	Continuous Drain Current @T _A =25°C	3.2	A	1
I _{DM}	Pulsed Drain Current	15	A	1
P _D	Total Power Dissipation @T _A =25°C	1.4	W	2
T _{STG}	Storage Temperature Range	-55 to 150	°C	
T _J	Operating Junction Temperature Range	-55 to 150	°C	

Thermal Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
R _{θJA}	Thermal Resistance Junction-Ambient		--	125	--	°C /W	1,4



N-Channel Enhancement MOSFET

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

Static Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$B_{V_{DS}}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	20	-	-	V	
I_{DSS}	Drain-Source Leakage Current	$V_{DS} = 20V, V_{GS} = 0V$	-	-	1	μA	
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm 8V, V_{DS} = 0V$	-	-	± 100	nA	

On Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$R_{DS(ON)}$	Drain-Source On-Resistance	$V_{GS} = 4.5V, I_D = 3.2A$	-	55	85	m Ω	3
		$V_{GS} = 2.5V, I_D = 2.5A$	-	65	115	m Ω	
		$V_{GS} = 1.8V, I_D = 2.0A$	-	80	130	m Ω	
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu A$		0.75	1.2	V	3

Dynamic Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
C_{ISS}	Input Capacitance	$V_{GS} = 0V,$ $V_{DS} = 15V$ $f = 1MHz$	-	455	-	pF	
C_{OSS}	Output Capacitance		-	90	-		
C_{RSS}	Reverse Transfer Capacitance		-	60	-		

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$T_{D(ON)}$	Turn-On Delay Time	$V_{DS} = 15V,$ $V_{GS} = 4.5V,$ $R_G = 6\Omega,$ $I_D = 1.0A$	-	9	-	ns	
T_R	Rise Time		-	4	-		
$T_{D(OFF)}$	Turn-Off Delay Time		-	20	-		
T_F	Fall Time		-	4.5	-		
Q_G	Total Gate Charge	$V_{DS} = 10V,$ $V_{GS} = 4.5V,$ $I_D = 3.2A$	-	6.4	-	nC	
Q_{GS}	Gate-Source Charge		-	3	-		
Q_{GD}	Gate-Drain (Miller) Charge		-	3.0	-		



CT3A01-R3

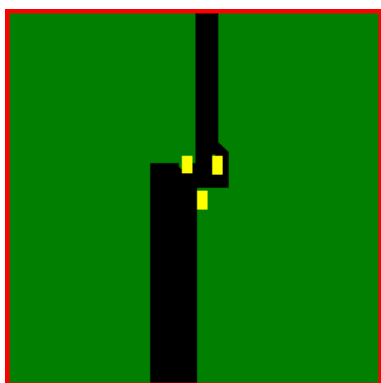
N-Channel Enhancement MOSFET

Drain-Source Diode Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_{SD}	Body Diode Forward Voltage	$V_{GS} = 0V, I_D = 3.2$	-	-	1.2	V	
I_{SD}	Body Diode Continuous Current		-	-	3.2	A	1

Note:

1. The power dissipation is limited by 150°C junction temperature.
2. Device mounted on a glass-epoxy board



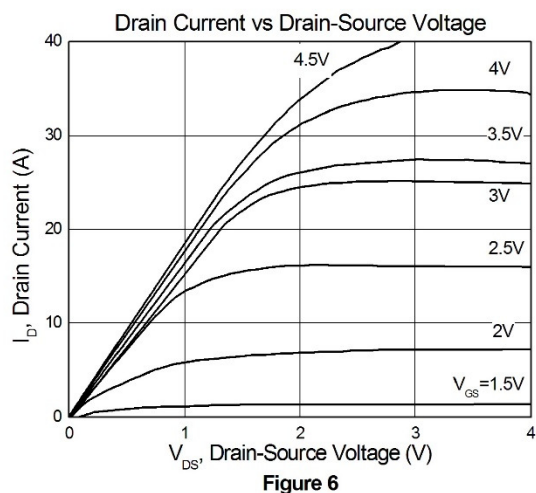
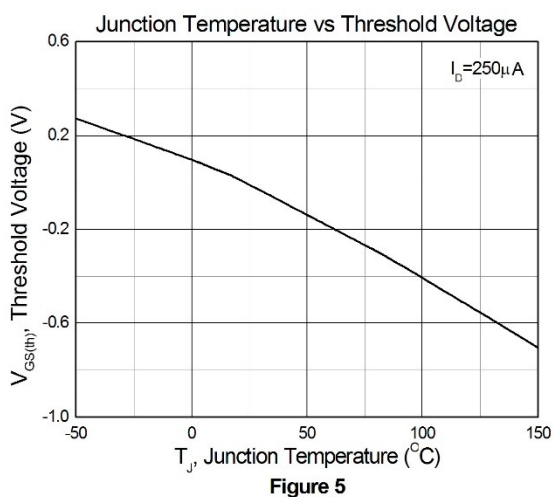
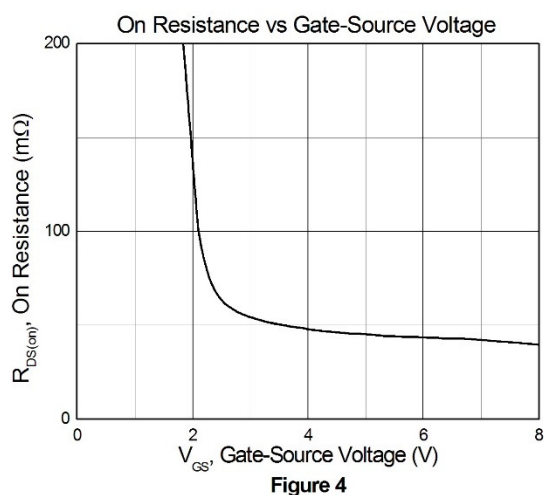
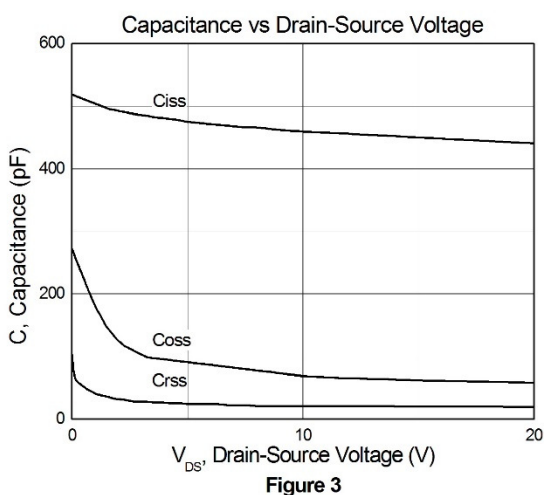
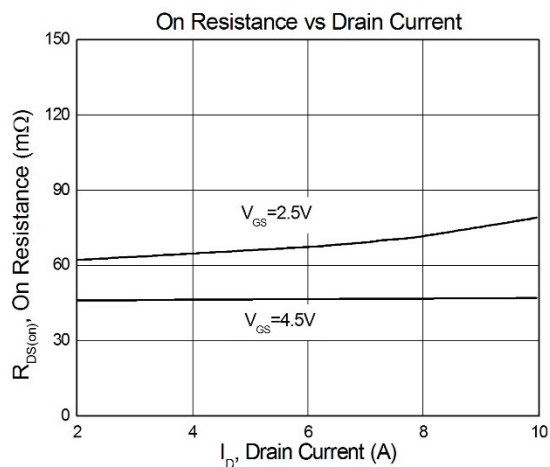
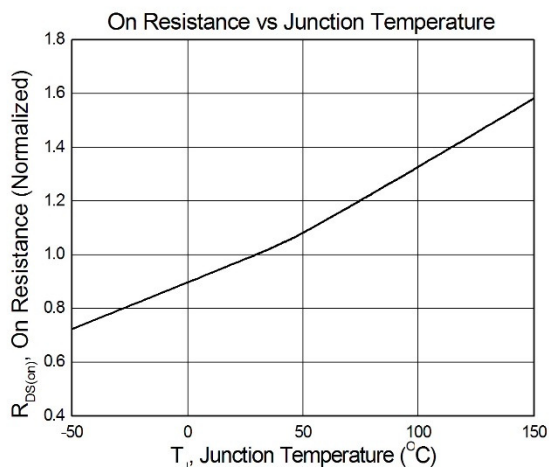
FR-4
25.4 × 25.4 mm .
2 Oz Copper

Actual Size

3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
4. Thermal Resistance follow JESD51-3.



Typical Characteristic Curves





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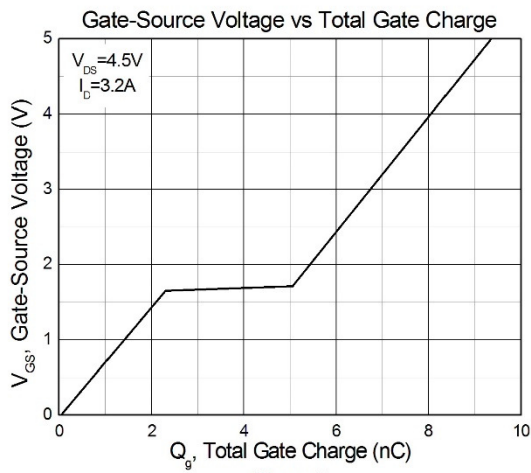


Figure 7

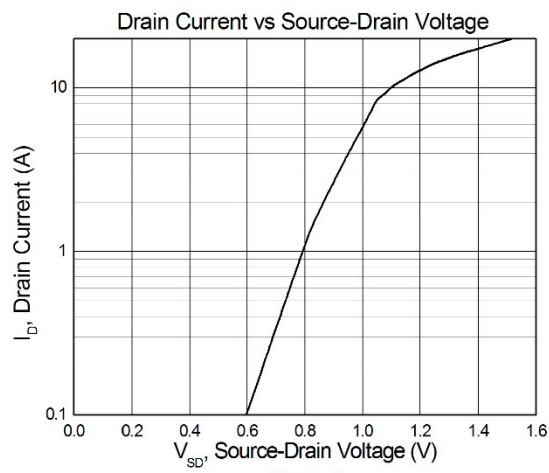


Figure 8



Test Circuits & Waveforms

Figure 9: Gate Charge Test Circuit

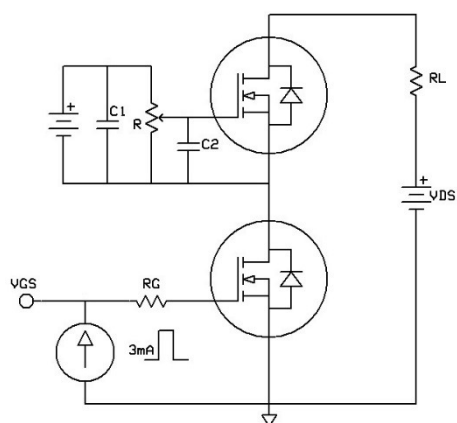


Figure 10: Gate Charge Waveform

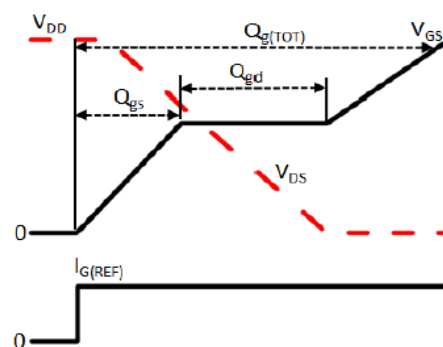


Figure 11: Switching Time Test Circuit

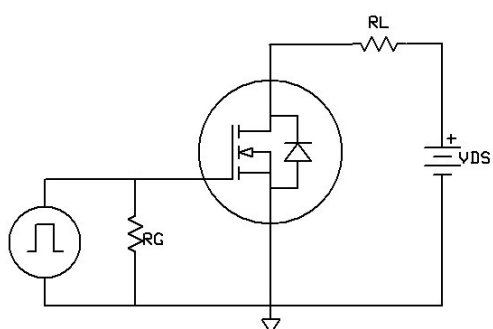
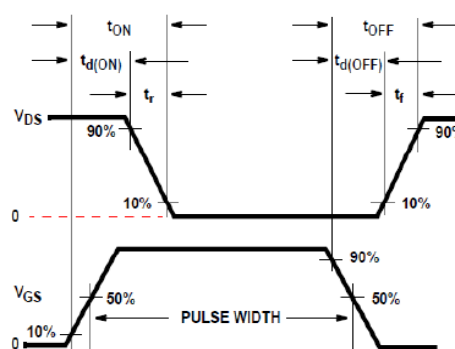
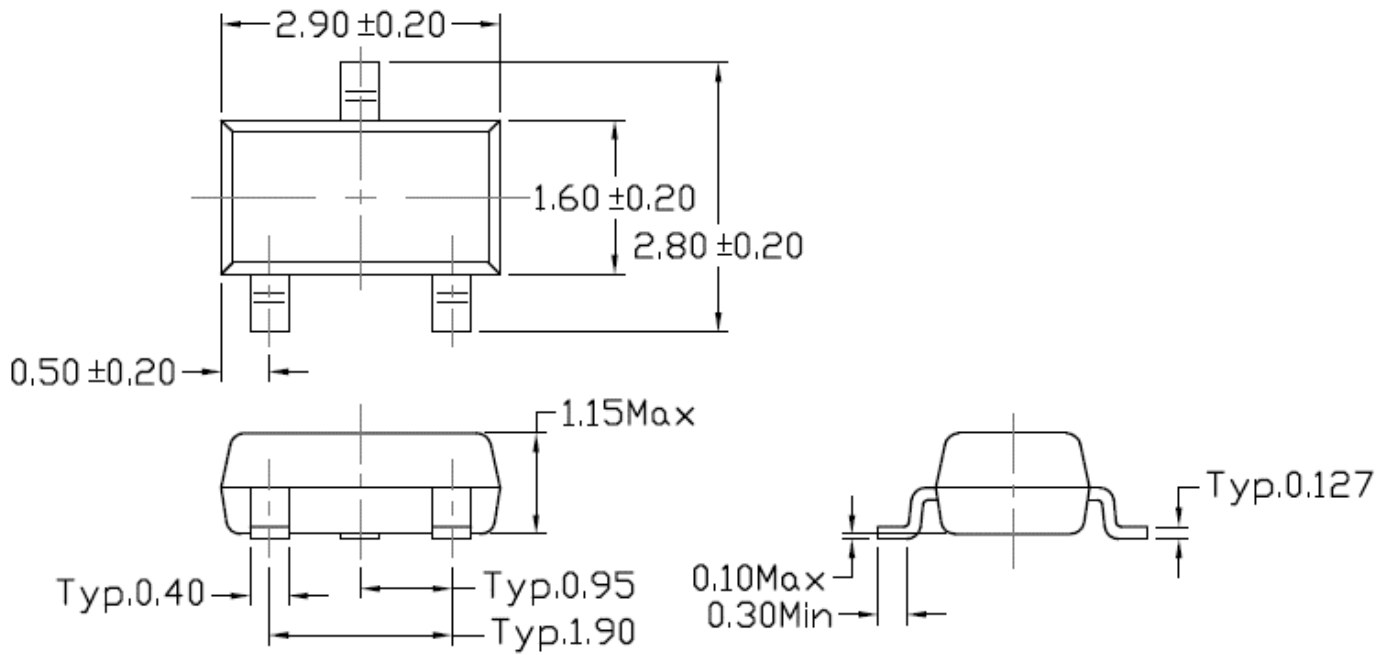


Figure 12: Switching Time Waveform

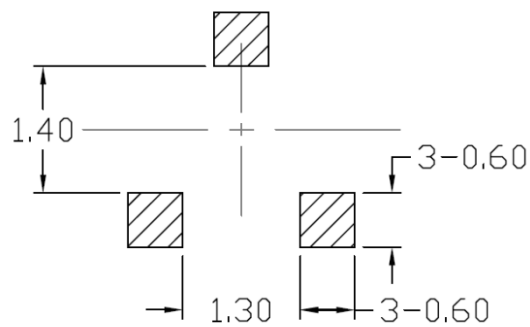




Package Dimension (SC-59)



Recommended pad layout for surface mount leadform

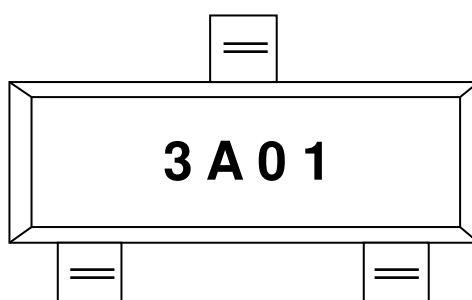




CT3A01-R3

N-Channel Enhancement MOSFET

Marking Information



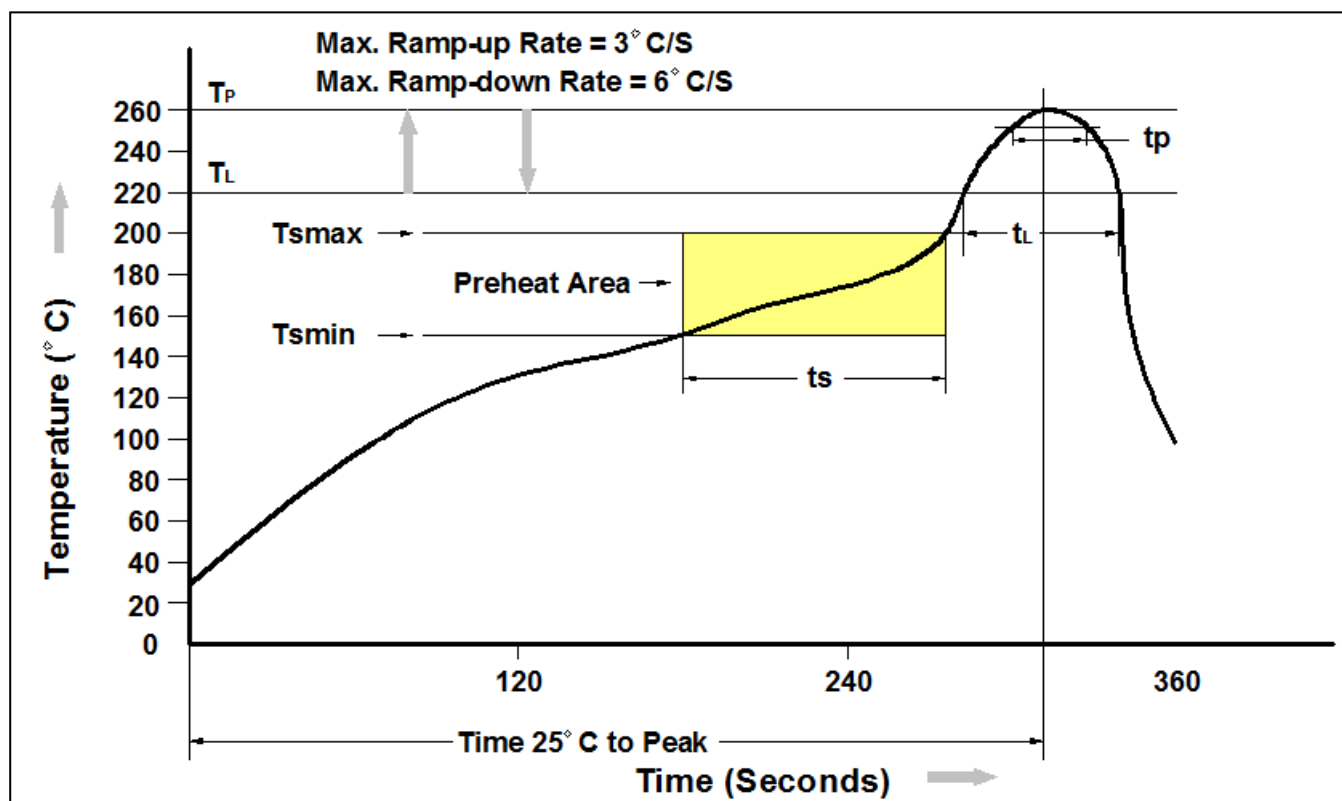
3A01 : Device Number

Ordering Information

<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
CT3A01-R3	SC-59 Reel	3000 pcs



Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150 °C
Temperature Max. (Tsmax)	200 °C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Ramp-up Rate (tL to tp)	3 °C/second max.
Liquidous Temperature (Tl)	217 °C
Time (tL) Maintained Above (Tl)	60 – 150 seconds
Peak Body Package Temperature	260 °C +0 °C / -5 °C
Time (tp) within 5 °C of 260 °C	30 seconds
Ramp-down Rate (Tp to Tl)	6 °C/second max
Time 25 °C to Peak Temperature	8 minutes max.



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