



N-Channel Enhancement MOSFET

Features

- Drain-Source Breakdown Voltage V_{DSS} 55V
- Drain-Source On-Resistance
 $R_{DS(ON)}$ 8m Ω , at $V_{GS}=10$, $I_D=59A$
- *Continuous Drain Current* at $T_C=25^\circ C$ $I_D=110A$
- Advanced high cell density Trench Technology
- RoHS Compliance & Halogen Free

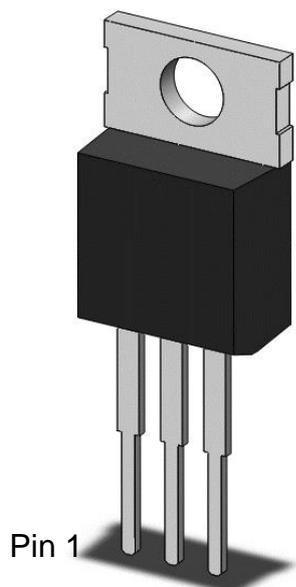
Description

These Power MOSFETs utilizes Advanced Trench Process Technology which comes with High Density Cell Design for Ultra Low RDS(ON). The device exhibits rugged avalanche characteristics and guaranteed to withstand a stipulated level of energy in the breakdown mode.

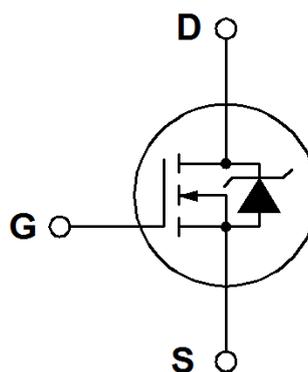
Applications

- Switching Applications
- Motor Drivers
- Relay Drivers

Package Outline



Schematic



Gate: **Pin 1**
Drain: **Pin 2**
Source: **Pin 3**



CTH11055NS

N-Channel Enhancement MOSFET

Absolute Maximum Rating at 25°C

Symbol	Parameters	Test Conditions	Min	Notes
V _{DS}	Drain-Source Voltage	55	V	
V _{GS}	Gate-Source Voltage	±20	V	
I _D	Continuous Drain Current	110	A	1
I _{DM}	Pulsed Drain Current	300	A	1
P _D	Total Power Dissipation	200	W	2
EAS	Pulsed Avalanche Rating	850	mJ	
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		--	62.5	--	°C /W	1,4



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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	$V_{GS} = 0V, I_D = 250\mu A$	55	-	-	V	
I_{DSS}	Drain-Source Leakage Current	$V_{DS} = 55V, V_{GS} = 0V$	-	-	1	μA	
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA	

On Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$R_{DS(ON)}$	Drain-Source On-Resistance	$V_{GS} = 10V, I_D = 59A$	-	6.0	8.0	m Ω	3
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu A$	2.0	-	4.0	V	3

Dynamic Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
C_{ISS}	Input Capacitance	$V_{GS} = 0V,$	-	4040	-	pF	
C_{OSS}	Output Capacitance	$V_{DS} = 25V$	-	342	-		
C_{RSS}	Reverse Transfer Capacitance	$f = 1MHz$	-	129	-		

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$T_{D(ON)}$	Turn-On Delay Time	$V_{DS} = 28V,$	-	28.7	-	ns	
T_R	Rise Time	$V_{GS} = 10V,$	-	8.6	-		
$T_{D(OFF)}$	Turn-Off Delay Time	$R_G = 2.5\Omega,$	-	61.5	-		
T_F	Fall Time	$I_D = 59A$	-	13.12	-		
Q_G	Total Gate Charge	$V_{DS} = 10V,$	-	72.3	-	nC	
Q_{GS}	Gate-Source Charge	$V_{GS} = 4.5V,$	-	21.4	-		
Q_{GD}	Gate-Drain (Miller) Charge	$I_D = 1A$	-	15.2	-		
T_{rr}	Reverse Recovery Time	$I_{SD} = 59A,$		40		nS	
Q_{rr}	Reverse Recovered Charge	$di/dt = 100A/s$		50		nC	



Drain-Source Diode Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V _{SD}	Body Diode Forward Voltage	V _{GS} = 0V, I _{SD} = 59	-	-	1.2	V	
I _{SD}	Body Diode Continuous Current		-	-	110	A	1

Note:

1. The power dissipation is limited by 150°C junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
3. Thermal Resistance follow JESD51-3.



Typical Characteristic Curves

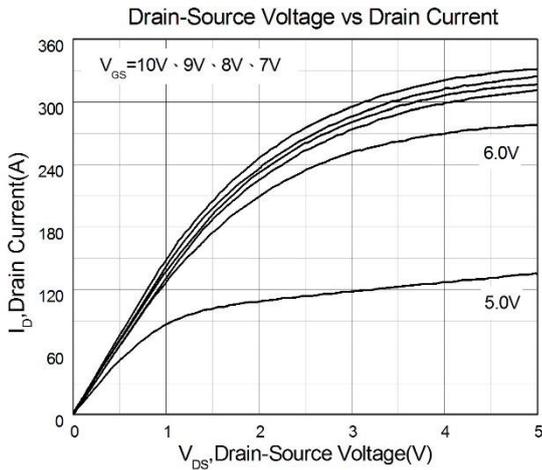


Figure 1

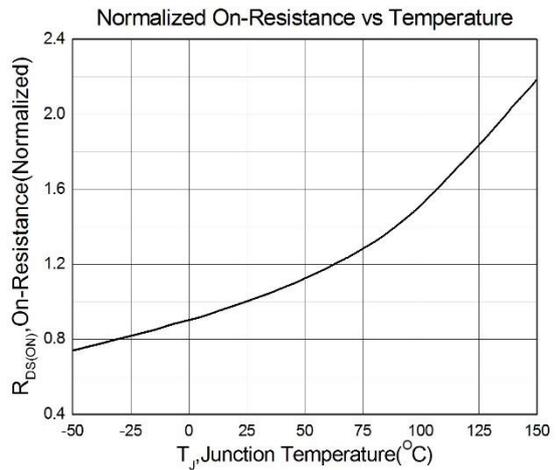


Figure 2

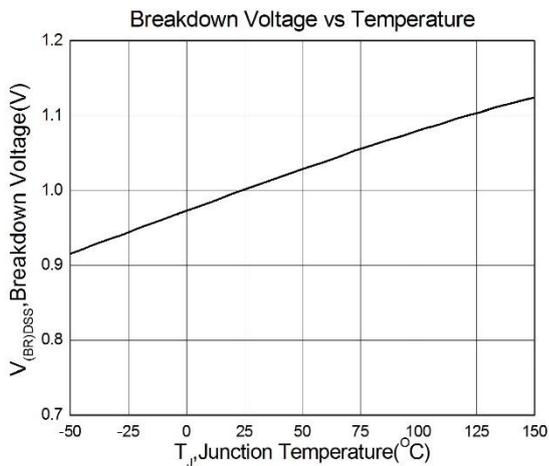


Figure 3

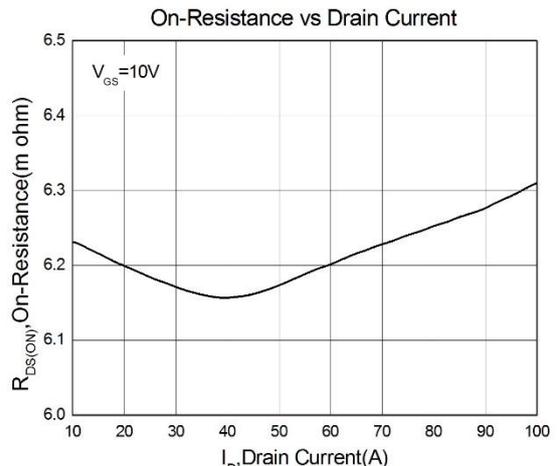


Figure 4

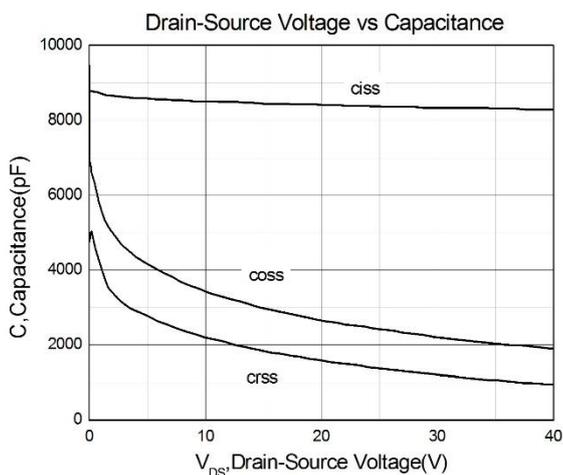


Figure 5

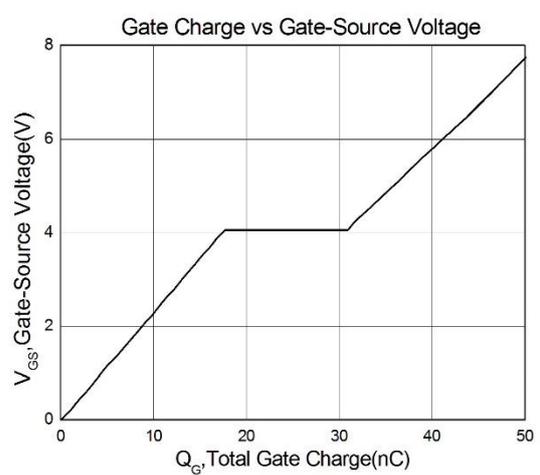


Figure 6

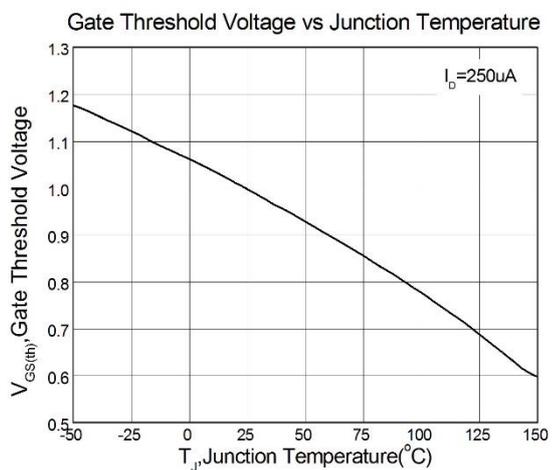


Figure 7

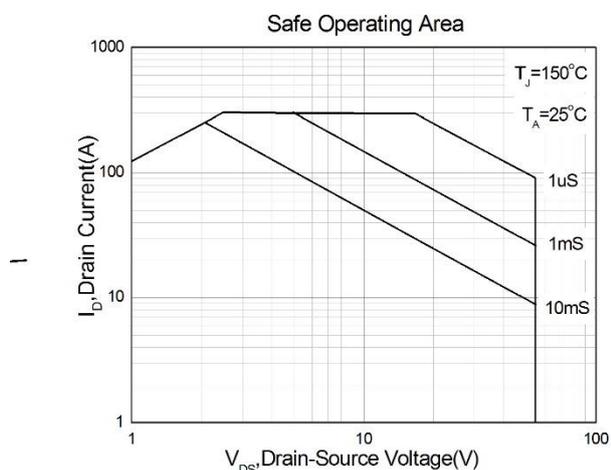


Figure 8



Test Circuits & Waveforms

Figure 9: Gate Charge Test Circuit

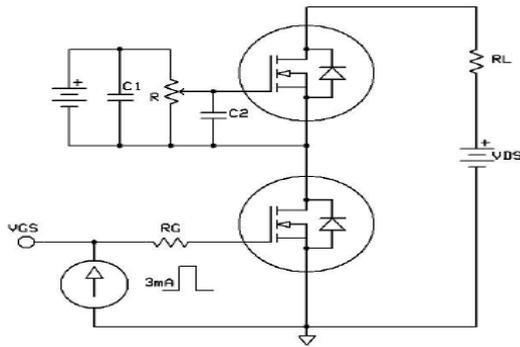


Figure 10: Gate Charge Waveform

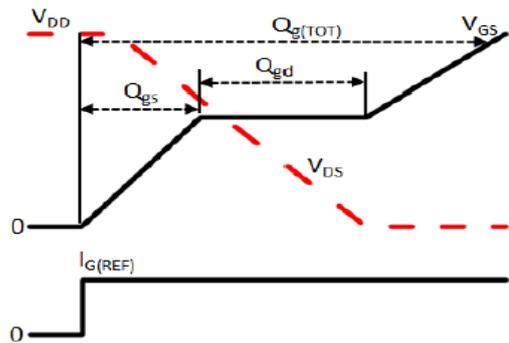


Figure 11: Switching Time Test Circuit

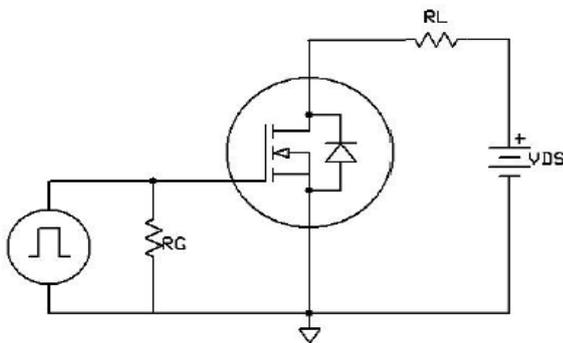


Figure 12: Switching Time Waveform

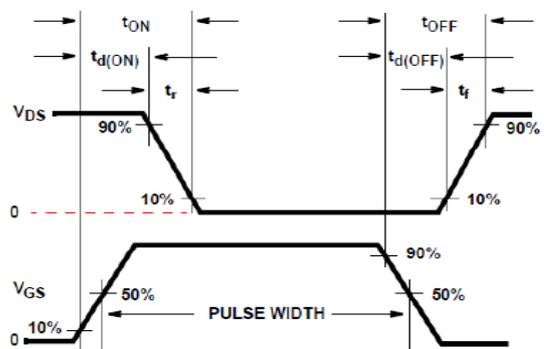


Figure 13: Unclamped Energy Test Circuit

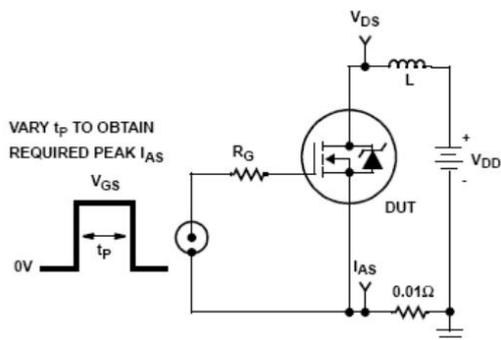
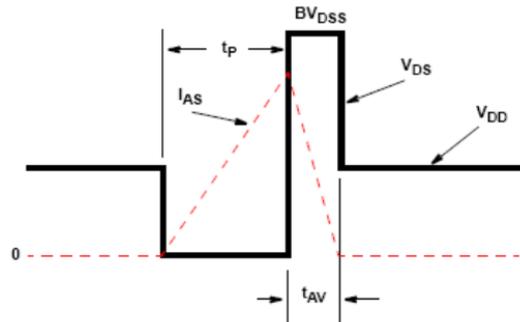


Figure 14: Unclamped Energy Waveforms

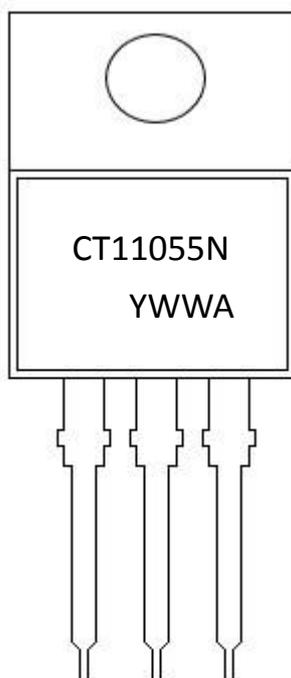




CTH11055NS

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Marking Information



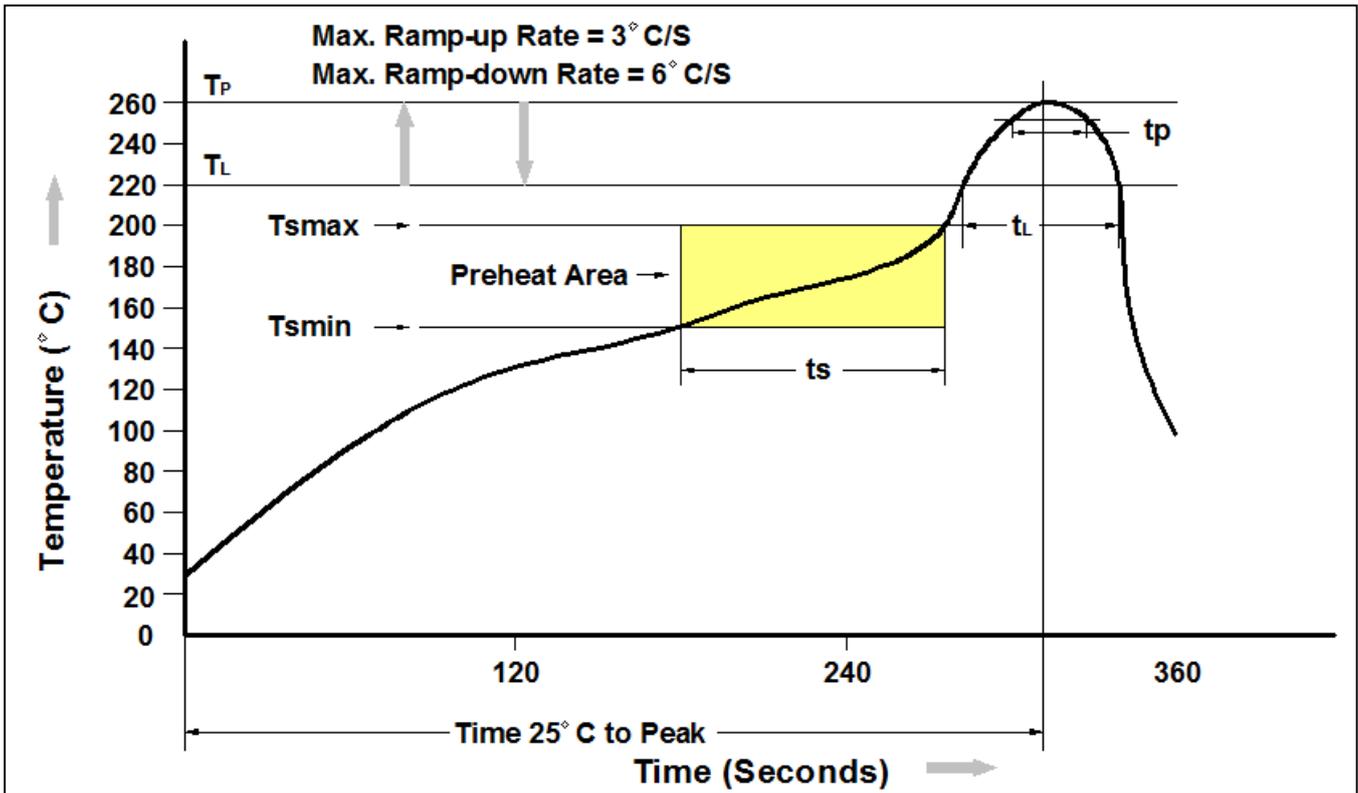
CT : CT-Micro
11055N : Device Number
Y : Fiscal Year
WW : Work Week
D : Production Code

Ordering Information

Part Number	Description	Quantity
CTH11055NS	TO-220 Tube	50 pcs



Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmín)	150°C
Temperature Max. (Tsmáx)	200°C
Time (ts) from (Tsmín to Tsmáx)	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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