

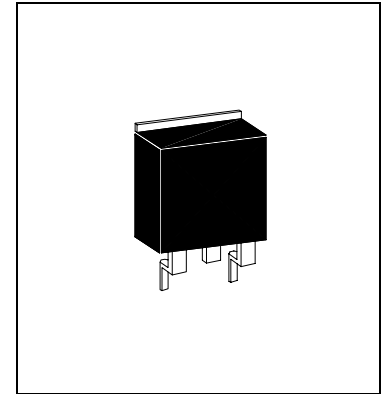


# HU603AL

N-Channel Logic Level Enhancement Mode Field Effect Transistor

## Description

This very high density process has been especially tailored to minimize on-state resistance and provide superior switching performance. These devices are particularly suited for low voltage applications such as DC/DC converters and other battery powered circuits where fast switching, low in-line power loss, and resistance to transients are needed.



## Absolute Maximum Ratings (Ta=25°C)

- Maximum Temperatures  
Operating and Storage Temperature ..... -65 ~ +175 °C
- Maximum Power Dissipation  
Total Power Dissipation at Tc=25°C ..... 60 W  
Derate Above 25°C ..... 0.4 W / °C
- Maximum Voltages and Currents  
Drain-Source Voltage ..... 30 V  
Gate-Source Voltage -Continuous ..... ±20 V  
Drain Current -Continuous ..... 30 A  
Drain Current -Pulsed ..... 100 A  
Thermal Resistance, Junction-to-Case ..... 2.5 °C / W  
Thermal Resistance, Junction-to-Ambient ..... 62.5 °C / W

## Electrical Characteristics

### • Off Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	-	-	10	uA
+I <sub>GSS</sub>	Gate-Body Leakage ,Forward	V <sub>GS</sub> =20V, V <sub>DS</sub> =0V	-	-	100	nA
-I <sub>GSS</sub>	Gate-Body Leakage ,Reverse	V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V	-	-	-100	nA

### • On Characteristics

V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.1	-	3	V
		V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =10mA	1.4	-	3	
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =25A	-	0.018	0.022	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A	-	0.029	0.040	
I <sub>DS(on)</sub>	On-State Drain Current	V <sub>GS</sub> =10V, V <sub>DS</sub> =10V	60	-	-	A
		V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V	15	-	-	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =25A	-	26	-	S

### • Dynamic Characteristic

C <sub>iSS</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V f=1.0Mhz	-	1100	-	pF
C <sub>oSS</sub>	Output Capacitance		-	600	-	pF
C <sub>rSS</sub>	Reverse Transfer Capacitance		-	180	-	pF



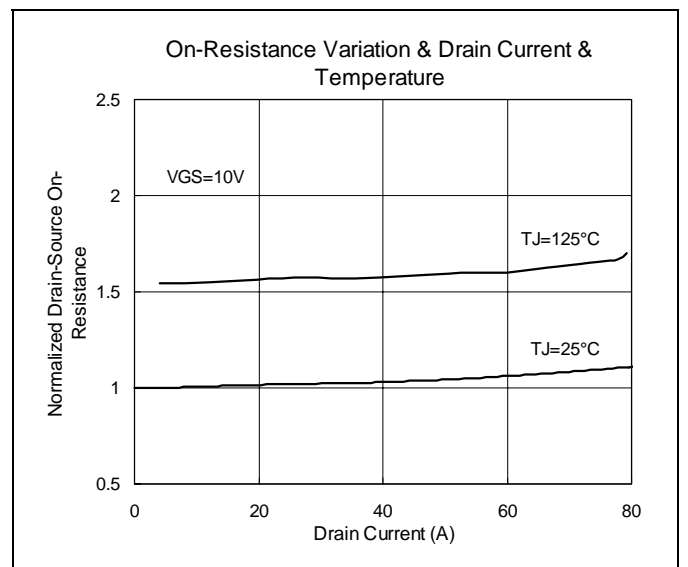
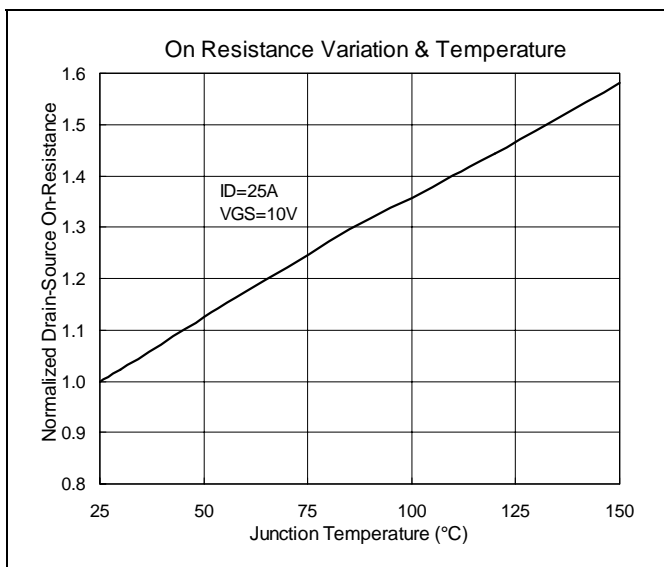
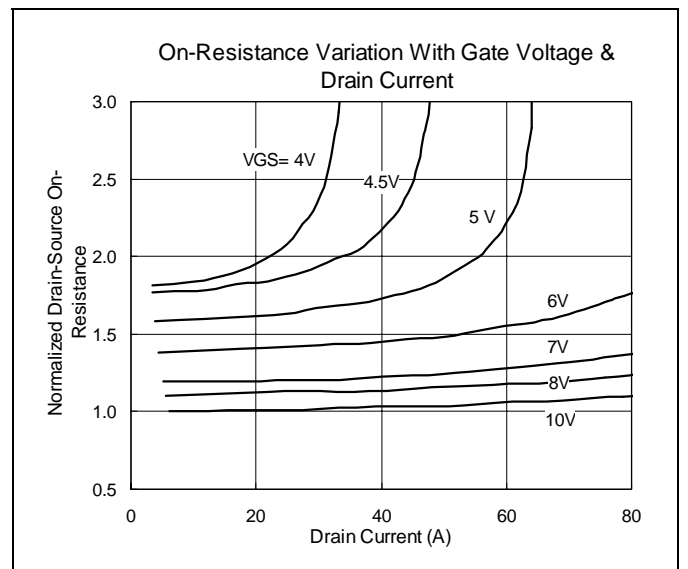
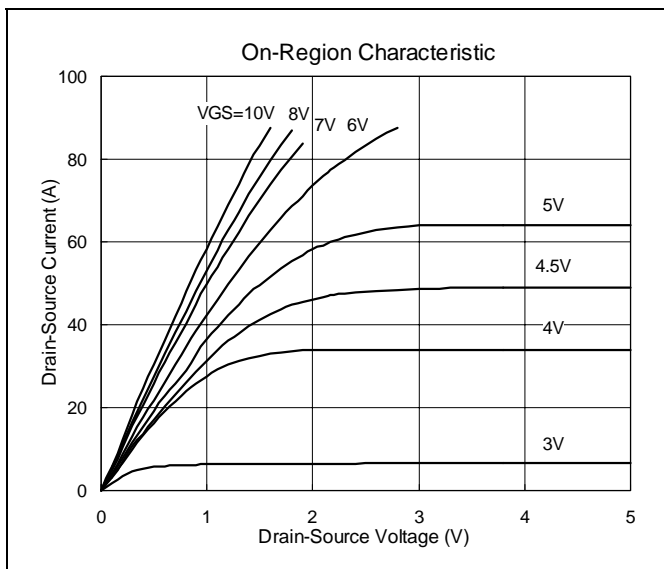
### • Switching Characteristics

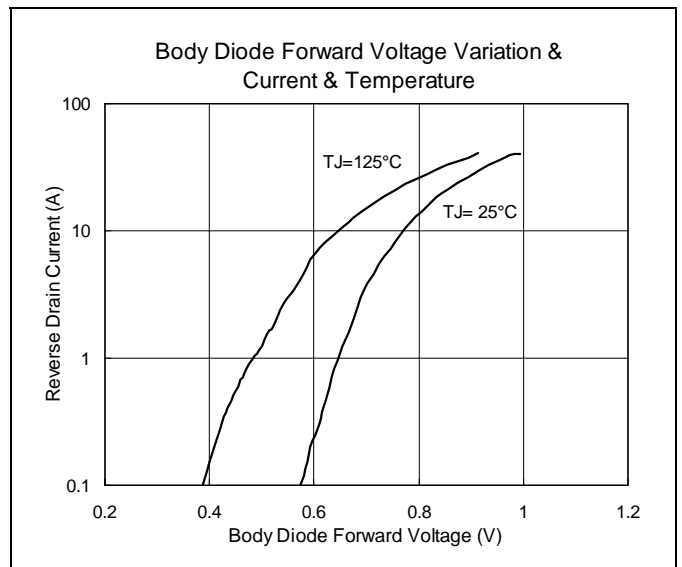
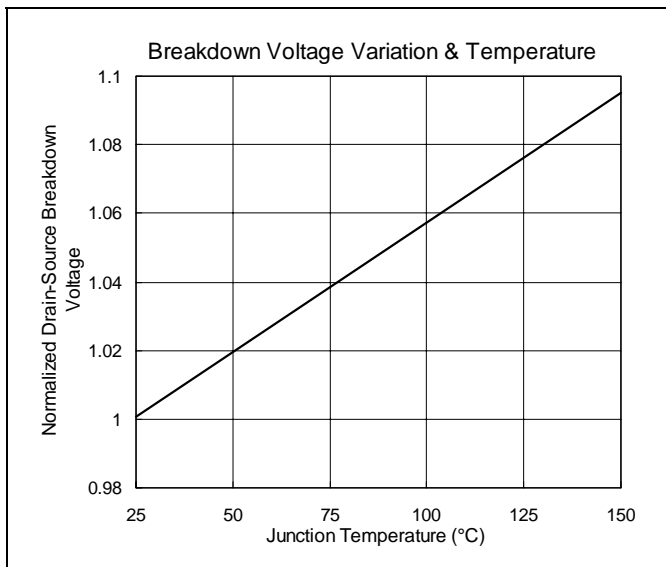
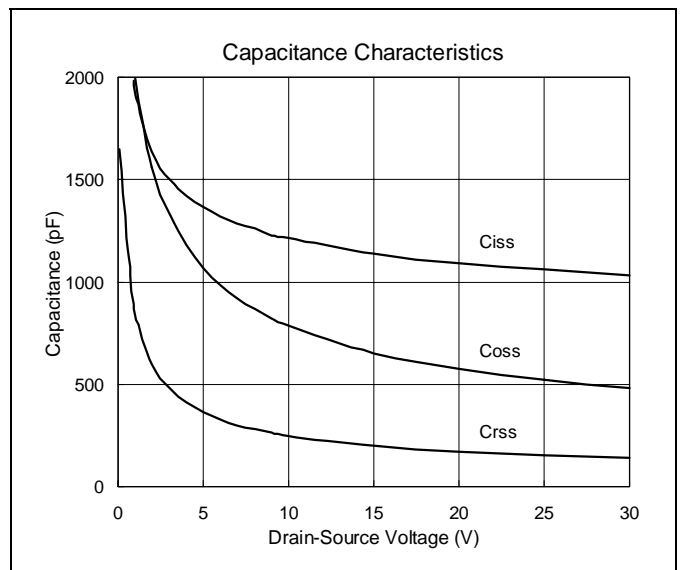
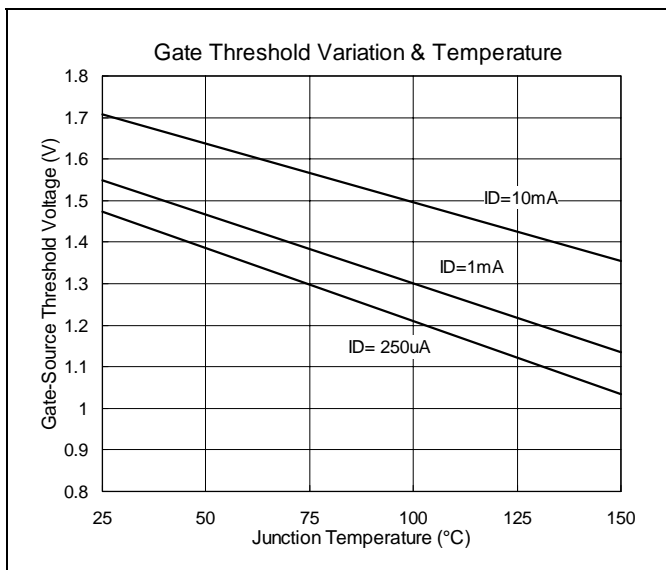
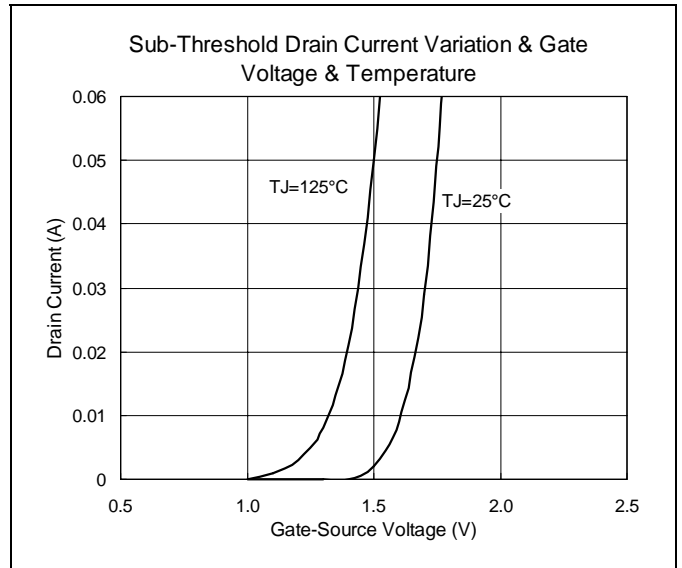
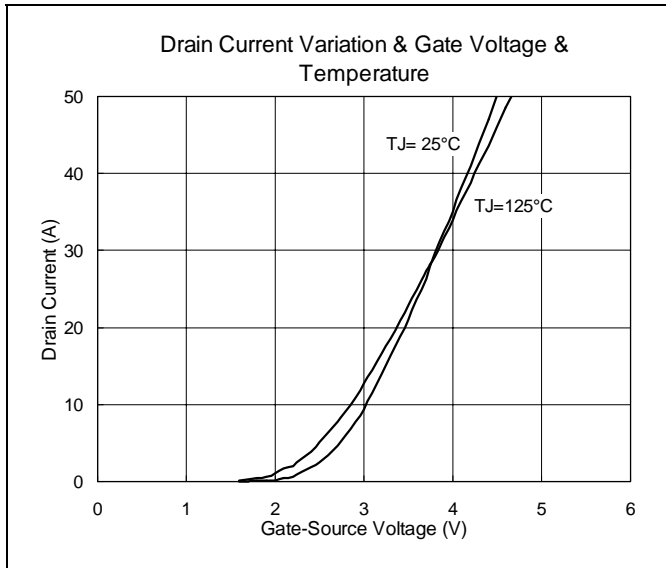
Symbol	Parameter	Condition	Min	Typ	Max	Unit
T(on)	Turn-On Delay Time	$V_{DS}=15V, I_D=25A$ $V_{GS}=10V, R_{GEN}=24\Omega$	-	-	30	ns
	Turn-On Rise Time		-	-	110	ns
T(off)	Turn-Off Delay Time		-	-	150	ns
	Turn-Off Fall Time		-	-	130	ns
$Q_g$	Total Gate Charge	$V_{DS}=10V, I_D=25A,$ $V_{GS}=10V$	-	-	45	nC
$Q_{gs}$	Gate-Source Charge		-	-	10	nC
$Q_{gd}$	Gate-Drain Charge		-	-	10	nC

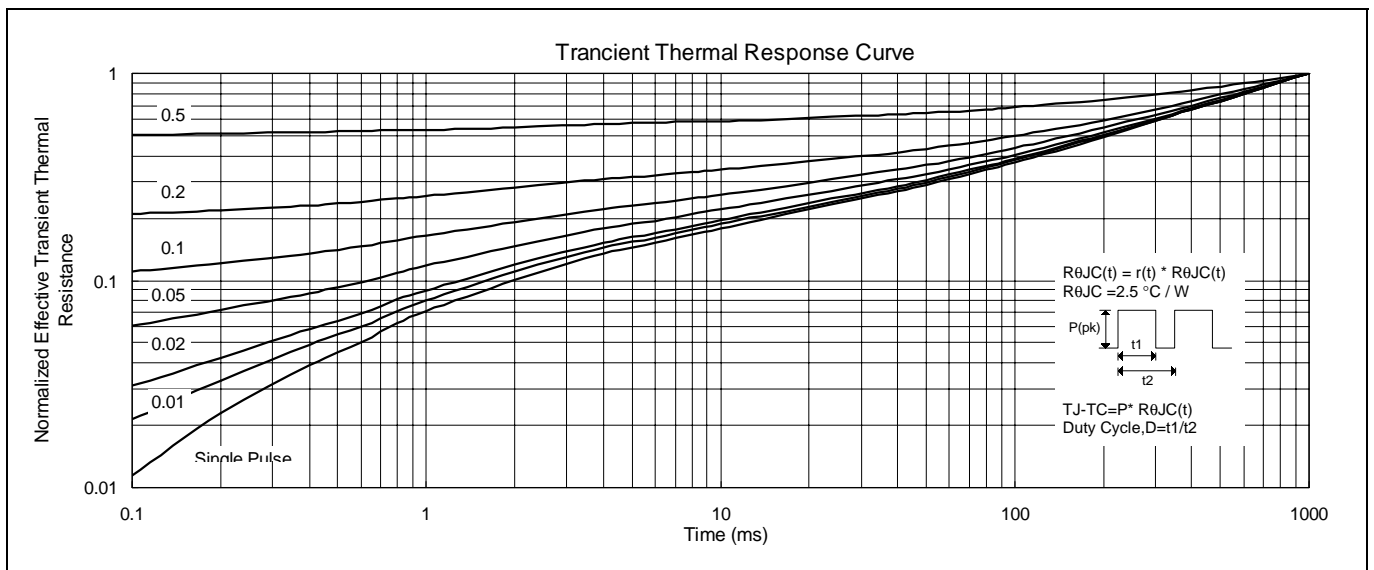
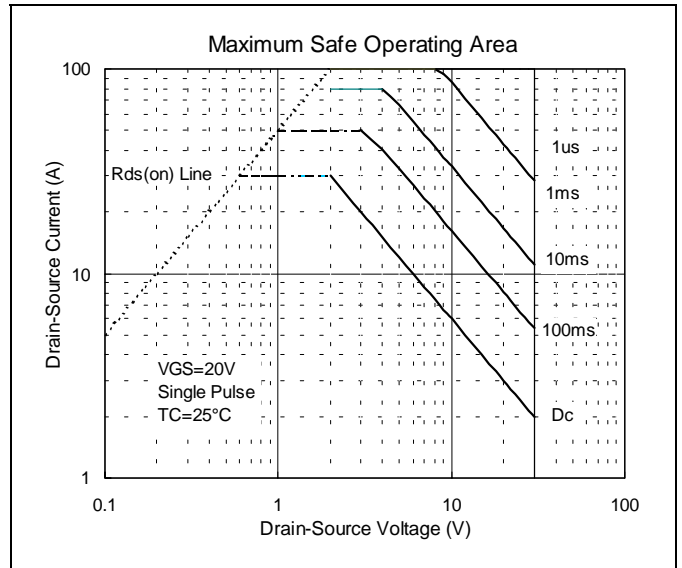
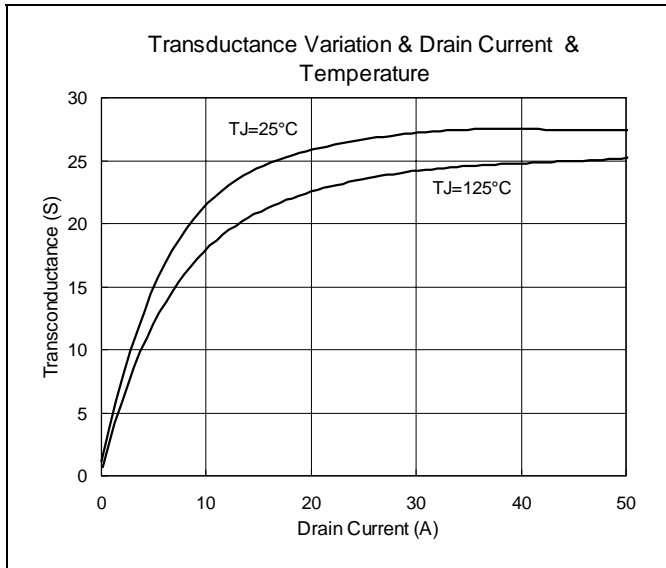
### • Drain-Source Diode Characteristics And Maximum Ratings

$V_{SD}$	Maximum Continuous Drain-Source Diode Forward Current	-	-	25	A
	Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=25A$	-	-	1.3

## Characteristics Curve









## TO-263 Dimension

**Marking :**

HSMC Logo		Product Series
Part Number		Rank
Date Code		

Style : Pin 1.Gate 2.Drain 3.Source

3-Lead TO-263 Plastic Surface Mounted Package  
HSMC Package Code : U

\*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.3800	0.4050	9.65	10.29	I	0.0500	0.0700	1.27	1.78
B	0.3300	0.3700	8.38	9.40	J	-	*0.1000	-	*2.54
C	-	0.0550	-	1.40	K	0.0450	0.0550	1.14	1.40
D	0.5750	0.6250	14.61	15.88	L	0.0200	0.0390	0.51	0.99
E	0.1600	0.1900	4.06	4.83	$\alpha 1$	-	-	6°	8°
F	0.0450	0.0550	1.14	1.40	$\alpha 2$	-	-	6°	8°
G	0.0900	0.1100	2.29	2.79	$\alpha 3$	-	-	0°	5°
H	0.0180	0.0290	0.46	0.74					

**Notes :** 1.Dimension and tolerance based on our Spec. dated Jan. 09,1998.  
 2.Controlling dimension : millimeters.  
 3.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 4.If there is any question with packing specification or packing method, please contact your local HSMC sales office.

**Material :**

- Lead : 42 Alloy ; solder plating
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0

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