SuperMOS –TOLL 100V BV_{DSS},1.07mΩ $R_{DS(on)}$, N-channel MOSFET

1. Description

The IPT015N10N5(ES) is N-Channel enhancement MOS Field Effect Transistor. Using advanced shielded gate trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product IPT015N10N5(ES) is Pb-free.

2. Features

- 100V, $R_{DS(ON)}$=1.07mΩ(TYP.) @V_{GS}=10V
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

100% UIS TESTED

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
IPT015N10N5(ES)	TOLL	GNT10R014/LOT	Halogen free	Tape & Reel	2,000 PCS	UL 94V-0	13 inches

Table-1 Ordering information

5. Pin Configuration and Functions

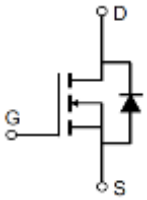
Pin	Function	Outline	Circuit Diagram
1	Gate		
2/3/4/5/6/7/8	Source		
9	Drain		

Table-2 Pin configuration

6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 ℃ ambient temperature unless otherwise specified.

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		BV_{DSS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	430	A
	T_C=100°C		258	
Maximum Power Dissipation	T_C=25°C	P_D	463	W
Pulsed Drain Current		I_{DM}	1720	A
Avalanche energy [a]		E_{AS}	1106	mJ
Operating Junction Temperature		T_J	-55 to 150	°C
Lead Temperature		T_L	260	°C
Storage Temperature Range		T_{stg}	-55 to 150	°C

Thermal resistance ratings

Single Operation			
Parameter	Symbol	Typical	Unit
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	0.27	°C/W

Note:

a: Starting TJ=25℃, V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25Ω,I_{AS}=66.5A.

Electrical Characteristics

At TA = 25℃ unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V			1.0	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D=250uA	2.4	3	3.6	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=30A		1.07	1.4	mΩ
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS}=0V, f=100KHz, V_{DS}=50V		9080		pF
Output Capacitance	C_{OSS}			3509		
Reverse Transfer Capacitance	C_{RSS}			79		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS}=0 to 10V, V_{DS}=50V, I_D=100A		160		nC
Gate-to-Source Charge	Q_{GS}			55		
Gate-to-Drain Charge	Q_{GD}			38		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS}=10V, V_{DD}=50V, I_D=100A, R_G=3Ω		30		ns
Rise Time	t_r			80		
Turn-Off Delay Time	$t_{d(OFF)}$			82		
Fall Time	t_f			95		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS}=0V, I_S=30A			1.2	V

7. Typical Characteristics

Figure 1: Output Characteristics

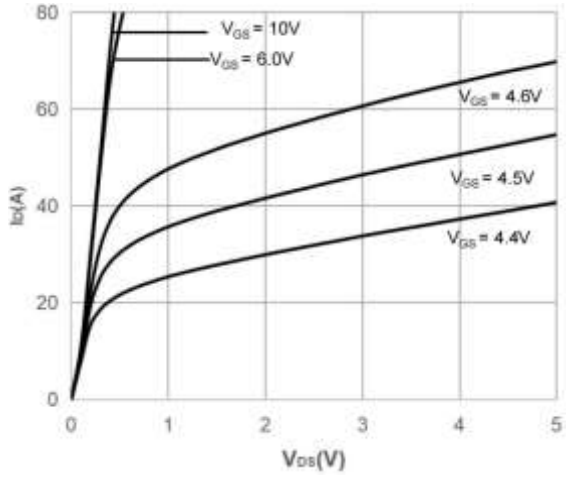


Figure 2: Typical Transfer Characteristics

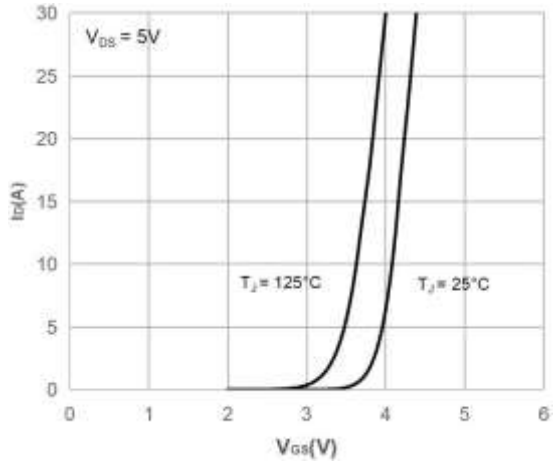


Figure 3: On-resistance vs. Drain Current

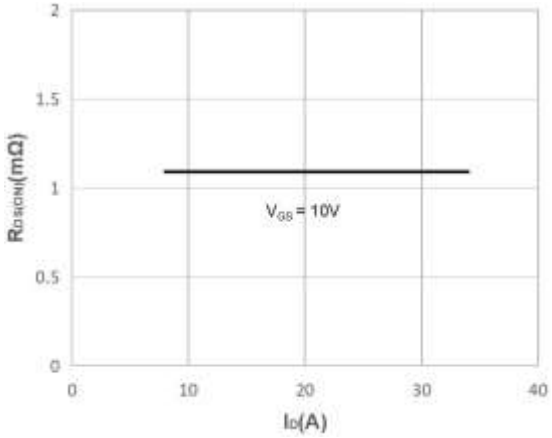


Figure 4: Body Diode Characteristics

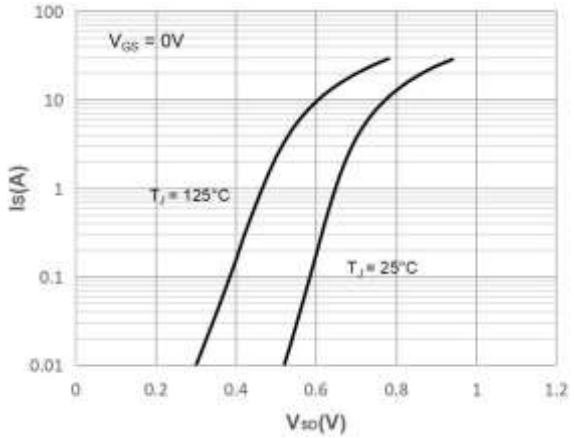


Figure 5: Capacitance Characteristics

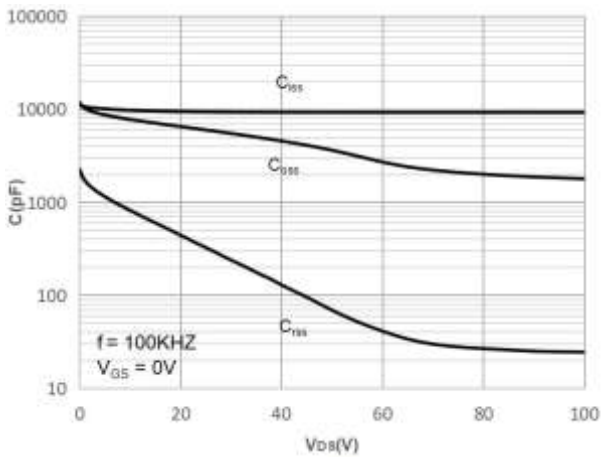
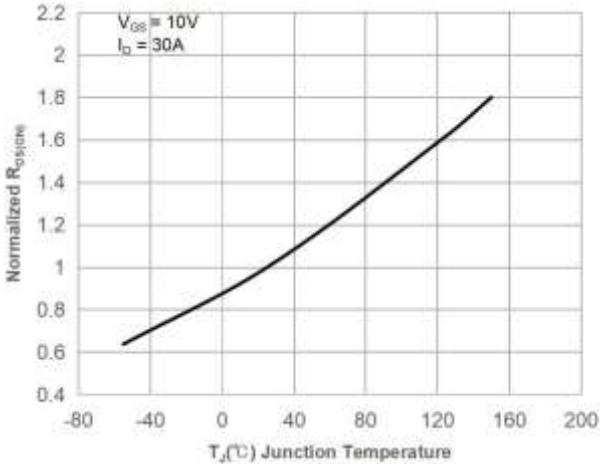
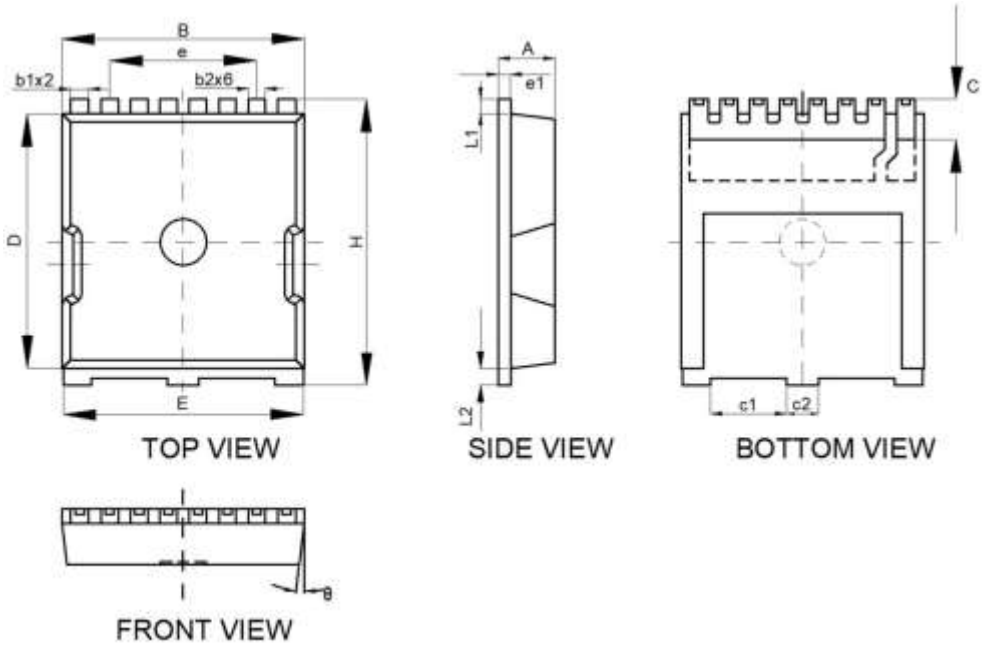


Figure 6: Normalized on Resistance vs. Junction Temperature

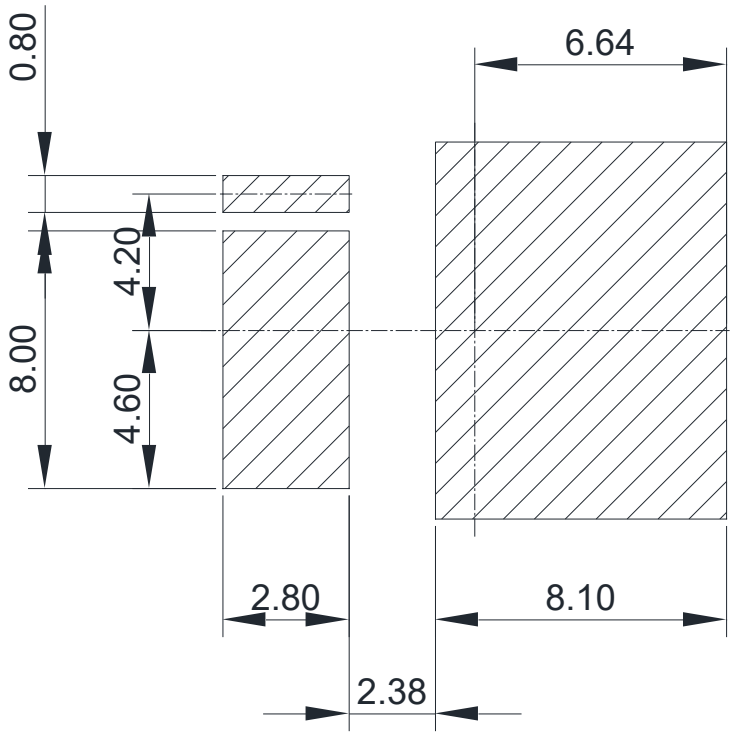


8. Dimension (TOLL)



SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.40
B	9.85	9.90	9.95
C	1.50	1.60	1.70
D	10.40	10.50	10.60
E	9.75	9.80	9.85
H	11.60	11.70	11.80
L1	0.55	0.65	0.75
L2	0.65	0.70	0.75
e		6.0BSC	
e1	0.45	0.50	0.55
b1	0.70	0.75	0.80
b2	0.60	0.70	0.80
c1	3.00	3.10	3.20
c2	1.10	1.20	1.30
θ		11°	

9. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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