

# NP179N04TUK

40 V – 180 A – N-channel Power MOS FET  
 Application: Automotive

R07DS1248EJ0100  
 Rev.1.00  
 Feb 12, 2015

## Description

The NP179N04TUK is N-channel MOS Field Effect Transistors designed for high current switching applications.

## Features

- Super low on-state resistance  
 $R_{DS(on)} = 1.25 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 90 \text{ A)}$
- Low Ciss  
 $C_{iss} = 8900 \text{ pF TYP. (} V_{DS} = 25 \text{ V)}$
- Designed for automotive application and AEC-Q101 qualified

## Ordering Information

Part No.	Lead Plating	Packing		Package
NP179N04TUK-E1-AY *1	Pure Sn (Tin)	Tape 800 p/reel	Taping (E1 type)	TO-263-7pin
NP179N04TUK-E2-AY *1			Taping (E2 type)	

Note: \*1 Pb-free (This product does not contain Pb in the external electrode)

## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ )

Item	Symbol	Ratings	Unit
Drain to Source Voltage ( $V_{GS} = 0 \text{ V}$ )	$V_{DSS}$	40	V
Gate to Source Voltage ( $V_{DS} = 0 \text{ V}$ )	$V_{GSS}$	$\pm 20$	V
Drain Current (DC) ( $T_C = 25^\circ\text{C}$ )	$I_{D(DC)}$	$\pm 180$	A
Drain Current (pulse) *1	$I_{D(pulse)}$	$\pm 720$	A
Total Power Dissipation ( $T_C = 25^\circ\text{C}$ )	$P_{T1}$	288	W
Total Power Dissipation ( $T_A = 25^\circ\text{C}$ ) *2	$P_{T2}$	1.8	W
Channel Temperature	$T_{ch}$	175	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +175	$^\circ\text{C}$
Repetitive Avalanche Current *3	$I_{AR}$	66	A
Repetitive Avalanche Energy *3	$E_{AR}$	435	mJ

Notes: \*1  $T_C = 25^\circ\text{C}$ ,  $P_W \leq 10 \mu\text{s}$ , Duty Cycle  $\leq 1\%$

\*2 Mounted on glass epoxy substrate of 40 mm  $\times$  40 mm  $\times$  1.6 mm with 4% Copper area (35  $\mu\text{m}$ )

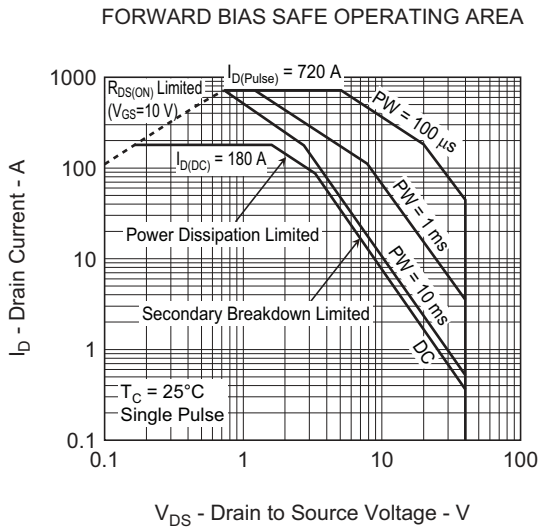
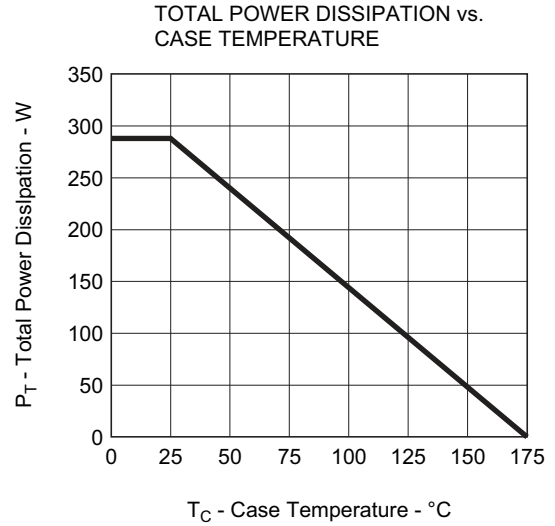
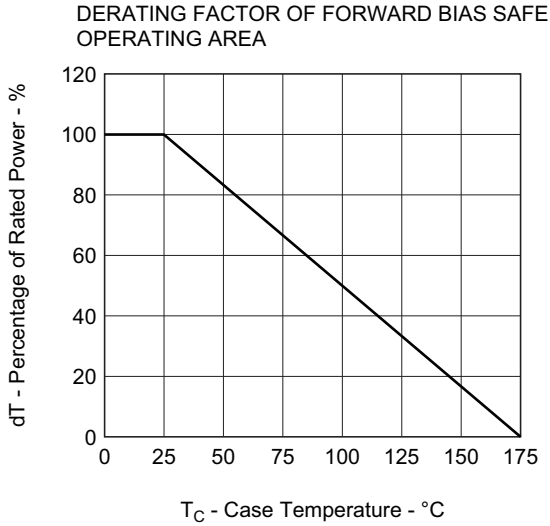
\*3  $R_G = 25 \Omega$ ,  $V_{GS} = 20 \text{ V} \rightarrow 0 \text{ V}$

## Thermal Resistance

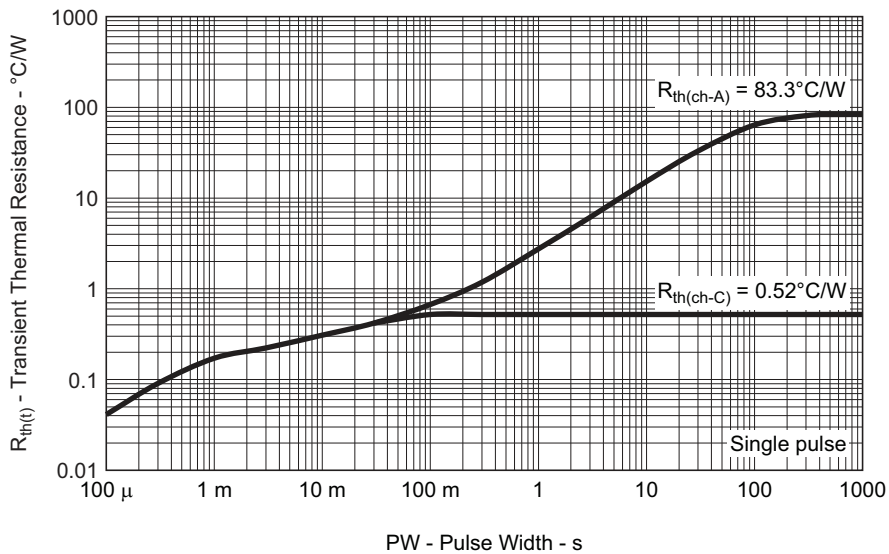
Channel to Case Thermal Resistance	$R_{th(ch-C)}$	0.52	$^\circ\text{C/W}$
Channel to Ambient Thermal Resistance	$R_{th(ch-A)}$	83.3	$^\circ\text{C/W}$



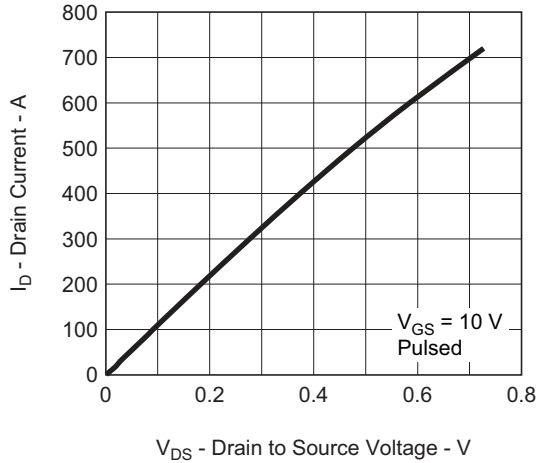
Typical Characteristics (T<sub>A</sub> = 25°C)



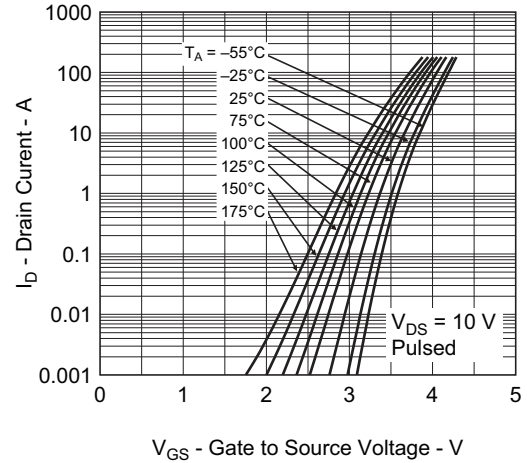
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



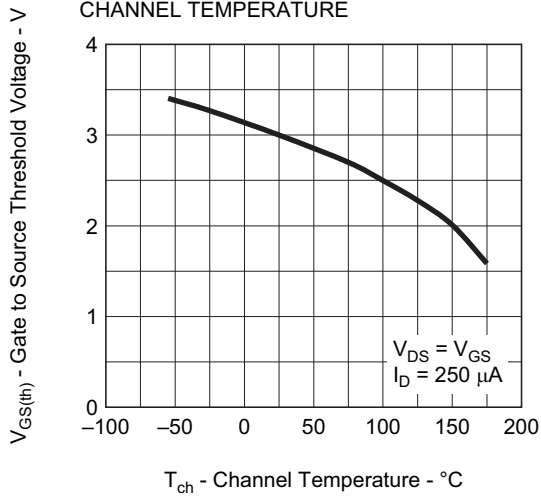
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



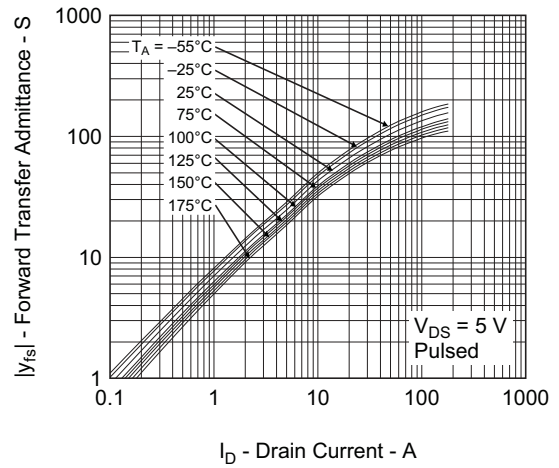
FORWARD TRANSFER CHARACTERISTICS



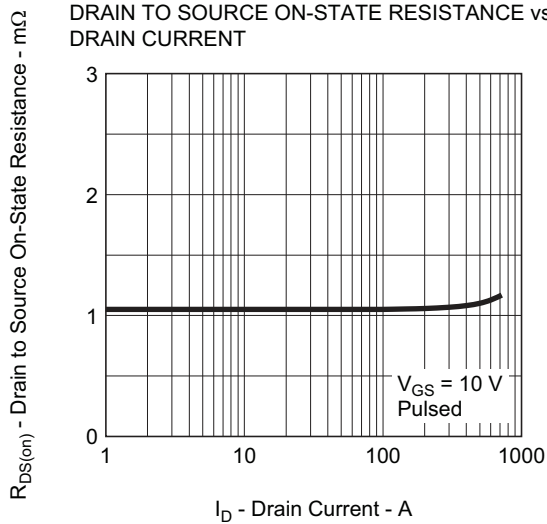
GATE TO SOURCE THRESHOLD VOLTAGE vs. CHANNEL TEMPERATURE



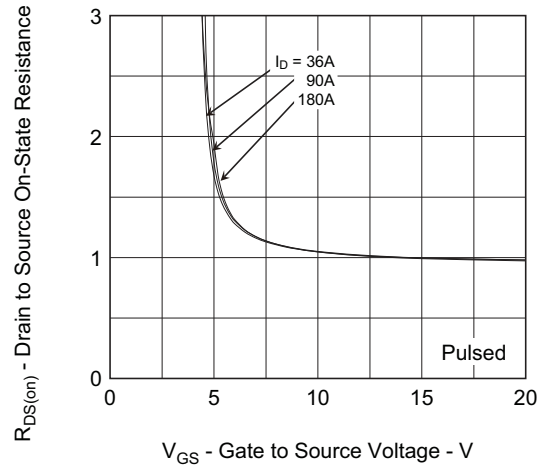
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



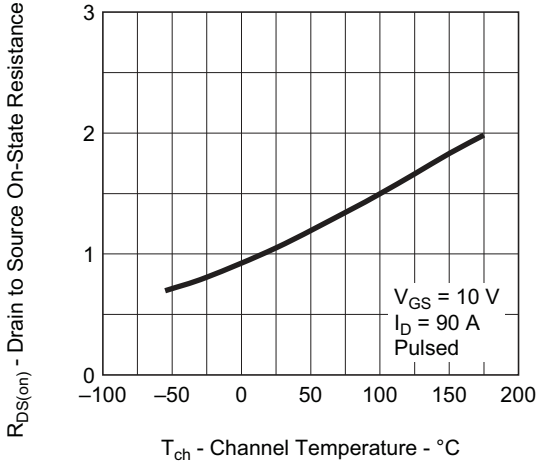
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



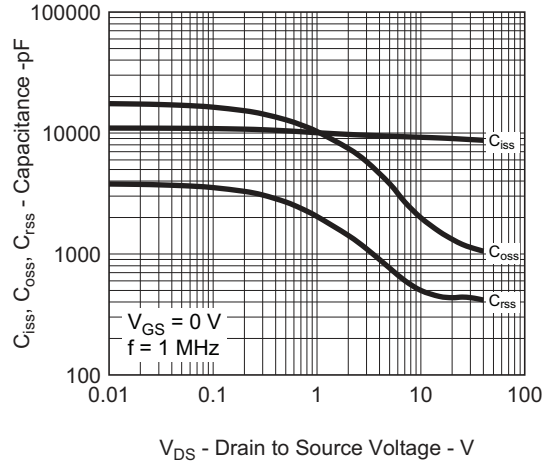
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



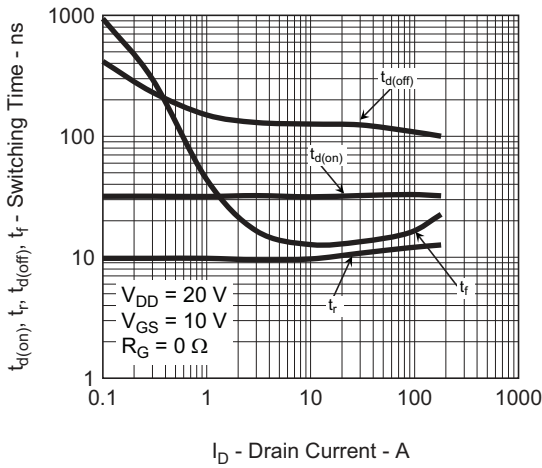
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



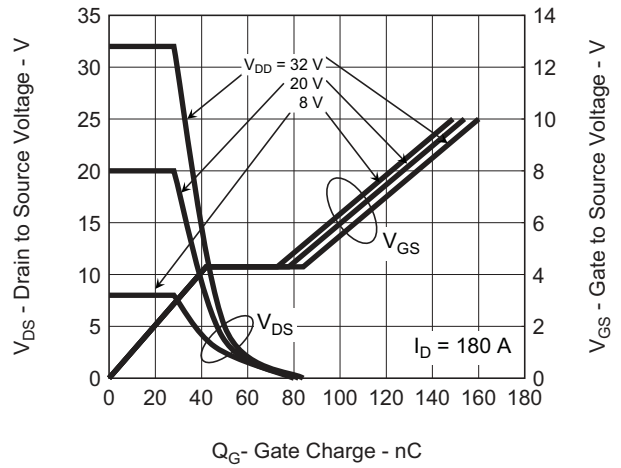
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



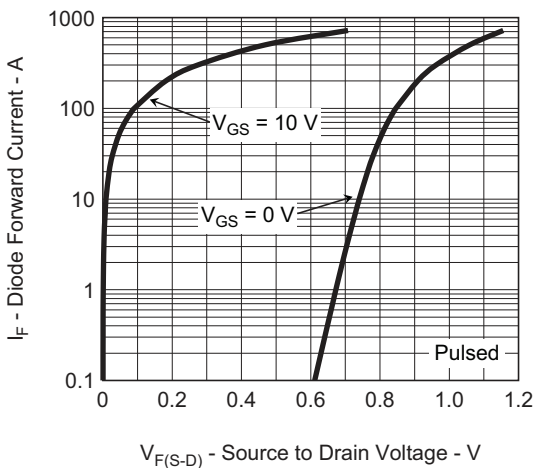
SWITCHING CHARACTERISTICS



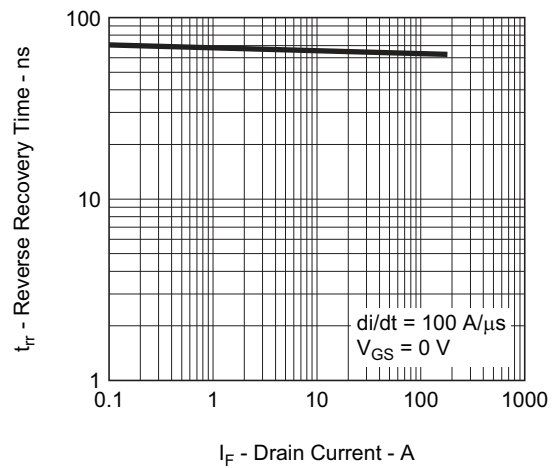
DYNAMIC INPUT/OUTPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



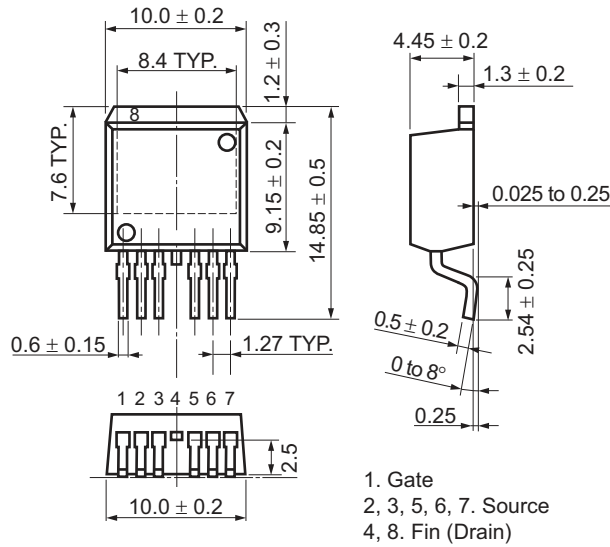
REVERSE RECOVERY TIME vs. DRAIN CURRENT



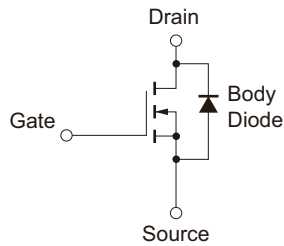
**Package Drawing (Unit: mm)**

**TO-263-7pin (MP-25ZT) (Mass: 0.128 g TYP.)**

Renesas Code: PRSS0008DB-A



**Equivalent Circuit**



Remark: Strong electric field, when exposed to this device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop generation of static electricity as much as possible, and quickly dissipate it once, when it has occurred.

<b>Revision History</b>	<b>NP179N04TUK Data Sheet</b>
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Rev.	Date	Description	
		Page	Summary
1.00	Feb 12, 2015	—	First Edition Issued

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