



**WANSEMI**  
万芯半导体

**WX044N10KF**

# **N-channel Enhancement Mode Power MOSFET**

TO-263/NMOS/100V/ $\pm 20$ V/3.0V/130A/4.4m $\Omega$

Rev0.5

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## 100V, 4.4mΩ, 130A, N-channel MOSFET

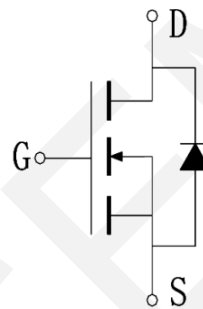
### 1.Features

- ◆ Low Gate Charge
- ◆ Ultra-low  $R_{DS(on)}$
- ◆ Halogen-free and RoHS-compliant
- ◆ 100% A UIS&Rg Tested

$V_{DS}$	$R_{DS(on)}$ Typ.	$I_D$ Max.
100V	4.4mΩ @10V	130A

### 2.Applications

- ◆ Current Switching in DC/DC & AC/DC (SR) Sub-system
- ◆ Motor Driving in Power Tool, E-vehicle, Robotics



Schematic Diagram

### 3.Package Marking and Ordering Information

Part no.	Package	Marking	PCS/Reel	PCS/CTN.
WX044N10KF	TO-263	044N10	800	4,800

### 4.Absolute Max Ratings at Ta=25°C (Note1)

Parameter	Symbol	Maximum	Units
Drain to Source Voltage	$V_{DSS}$	100	V
Gate to Source Voltage	$V_{GSS}$	±20	V
Drain Current (DC)	$I_D$	130	A
Drain Current (Pulse), $PW \leq 300\mu s$	$I_{DP}$	520	A
Total Dissipation	$P_D$	250	W
Avalanche Energy, Single Pulsed	$E_{AS}$	702	mJ
Junction Temperature	$T_j$	150	°C
Storage Temperature	$T_{stg}$	-55 to +150	°C

Note 1: Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### 5. Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Ambient	$R_{\theta JA}$	60	$^{\circ}C/W$
Junction to case	$R_{\theta JC}$	0.5	$^{\circ}C/W$

Note 2: When mounted on 1 inch square copper board  $t \leq 10\text{sec}$  The value in any given application depends on the user's specific board design.

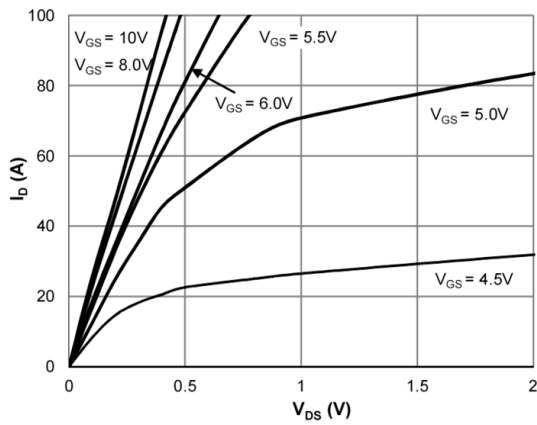
### 6. Electrical Characteristics at $T_a=25^{\circ}C$ (Note 2)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	100	-	-	V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate to Source Leakage Current	$I_{GSS1}$	$V_{GS} = \pm 20V, V_{SS} = 0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2.2	3.0	3.8	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 20A, V_{GS} = 10V$	-	4.4	5.3	m $\Omega$
Input Capacitance	$C_{iss}$	$V_{GS}=0V,$ $V_{DS}=50V,$ Frequency=1.0MHz	-	3962	-	pF
Output Capacitance	$C_{oss}$		-	101	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	47	-	pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS} = 45V, R_L = 2.3\Omega$ $V_{GS} = 10V,$ $R_{GEN} = 3\Omega$	-	17	-	ns
Rise Time	$t_r$		-	29	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	45	-	ns
Fall Time	$t_f$		-	16	-	ns
Total Gate Charge	$Q_g$	$V_{DS} = 45V,$ $V_{GS} = 10V,$ $I_D = 20A$	-	63	-	nC
	$Q_{gs}$		-	25	-	nC
	$Q_{gd}$		-	11.4	-	nC
Diode Forward Voltage	$V_{FSD}$	$I_S = 20A, V_{GS} = 0$	0.4	-	1.2	V

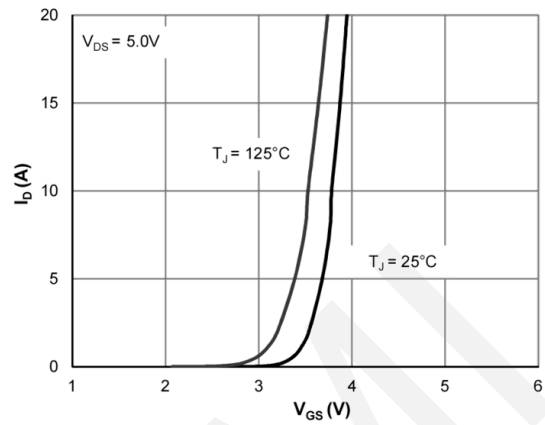
Note 2: Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.



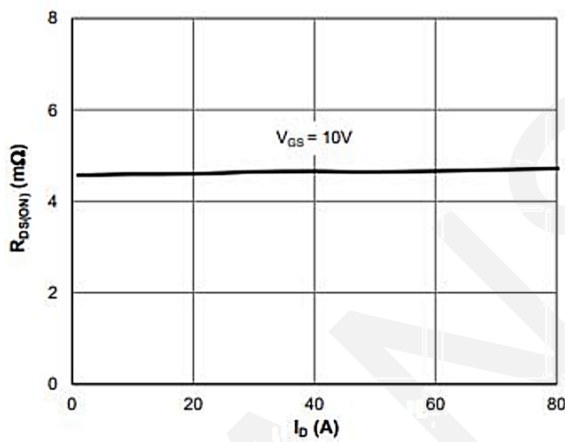
### 7. Typical electrical and thermal characteristics



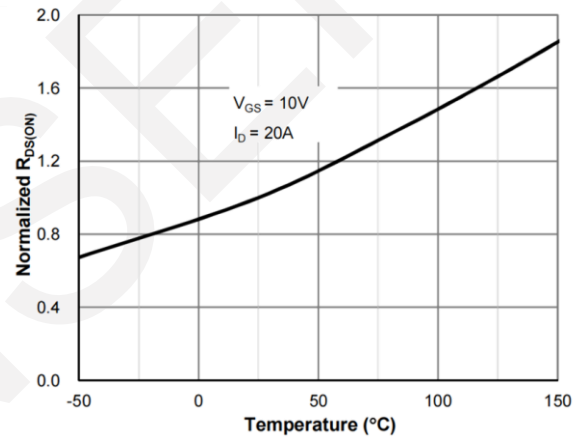
Saturation Characteristics



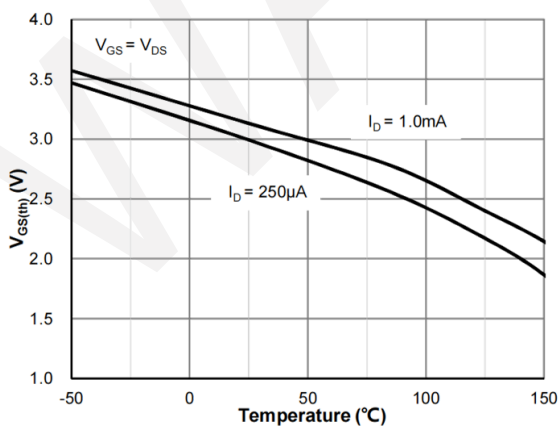
Transfer Characteristics



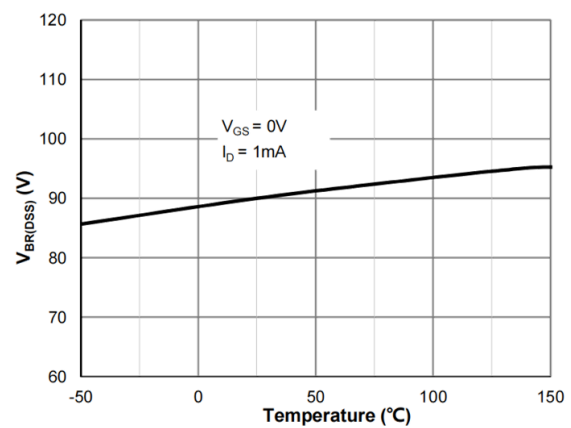
$R_{DS(on)}$  vs. Drain Current



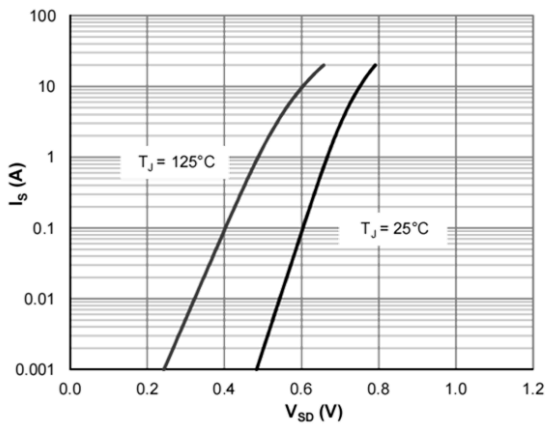
$R_{DS(on)}$  vs. Junction Temperature



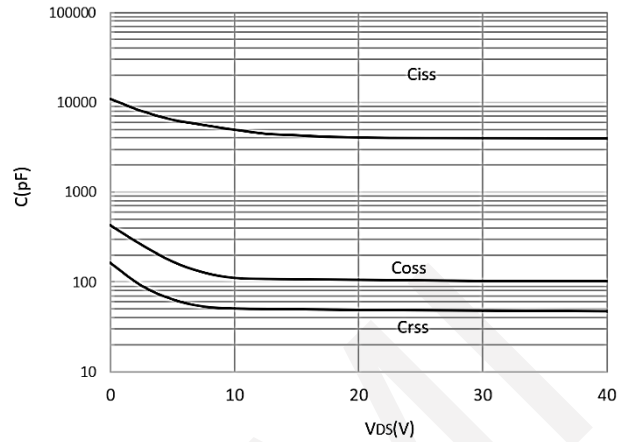
$V_{GS(th)}$  vs. Junction Temperature



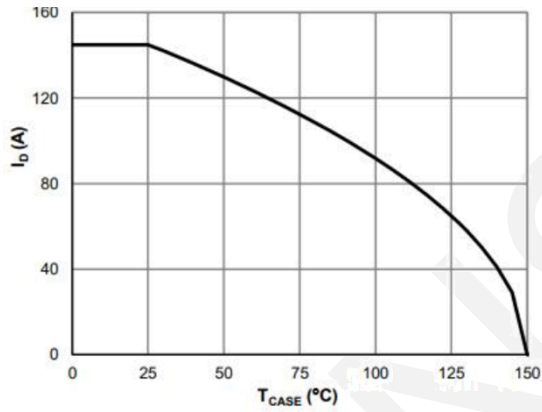
$V_{BR(DSS)}$  vs. Junction Temperature



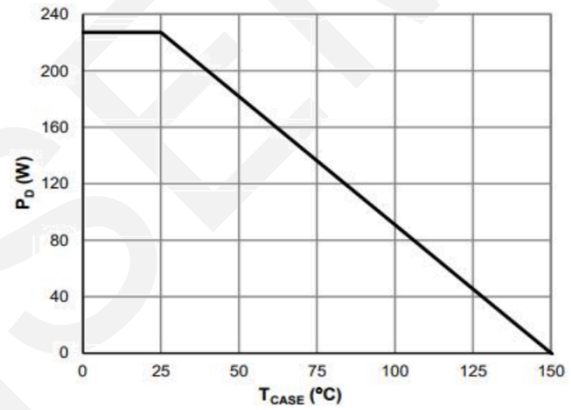
**Body-Diode Characteristics**



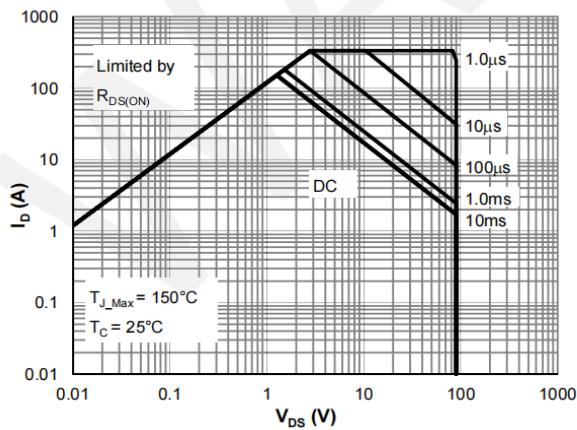
**Capacitance Characteristics**



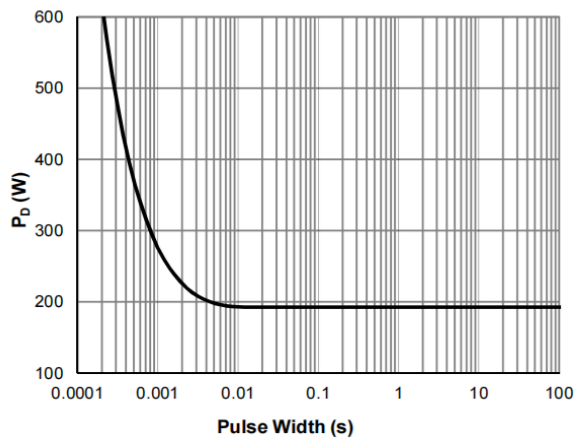
**Current De-rating**



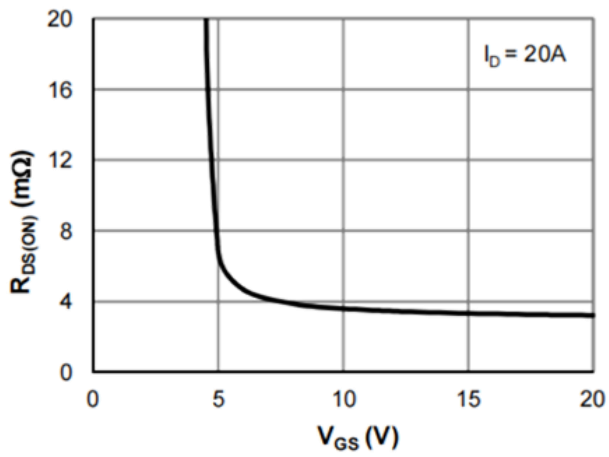
**Power De-rating**



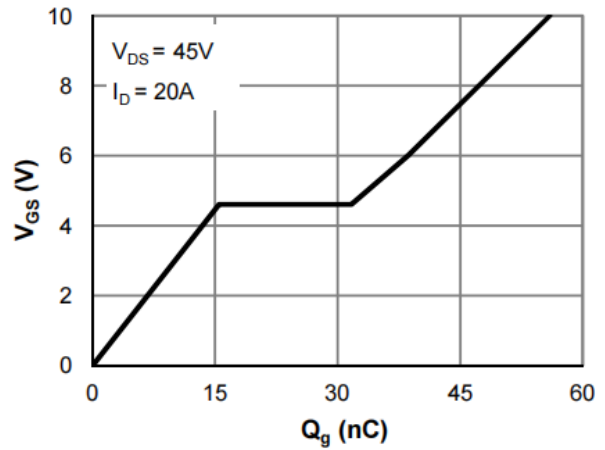
**Maximum Safe Operating Area**



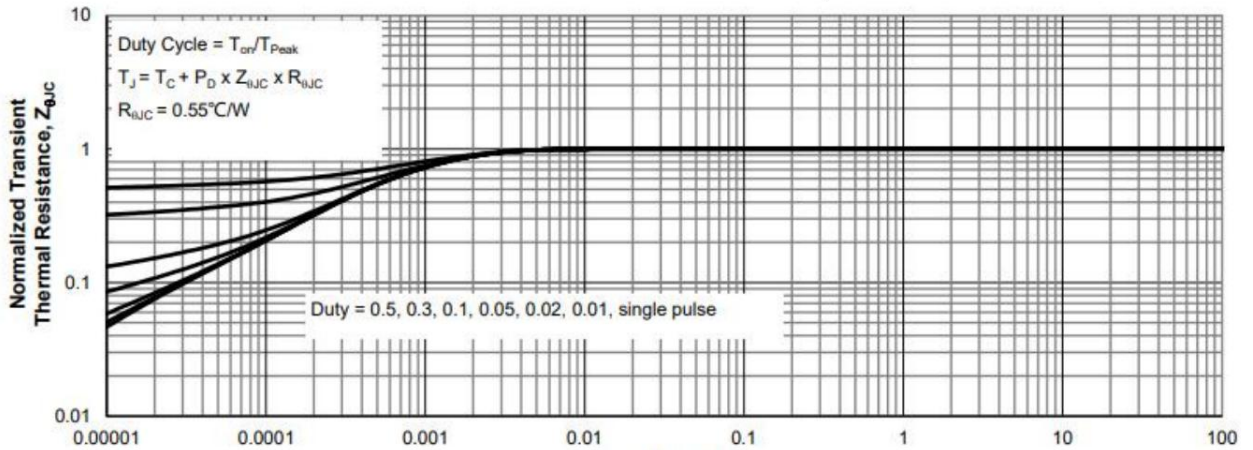
**Single Pulse Power Rating, Junction-to-Case**



$R_{DS(on)}$  vs.  $V_{GS}$



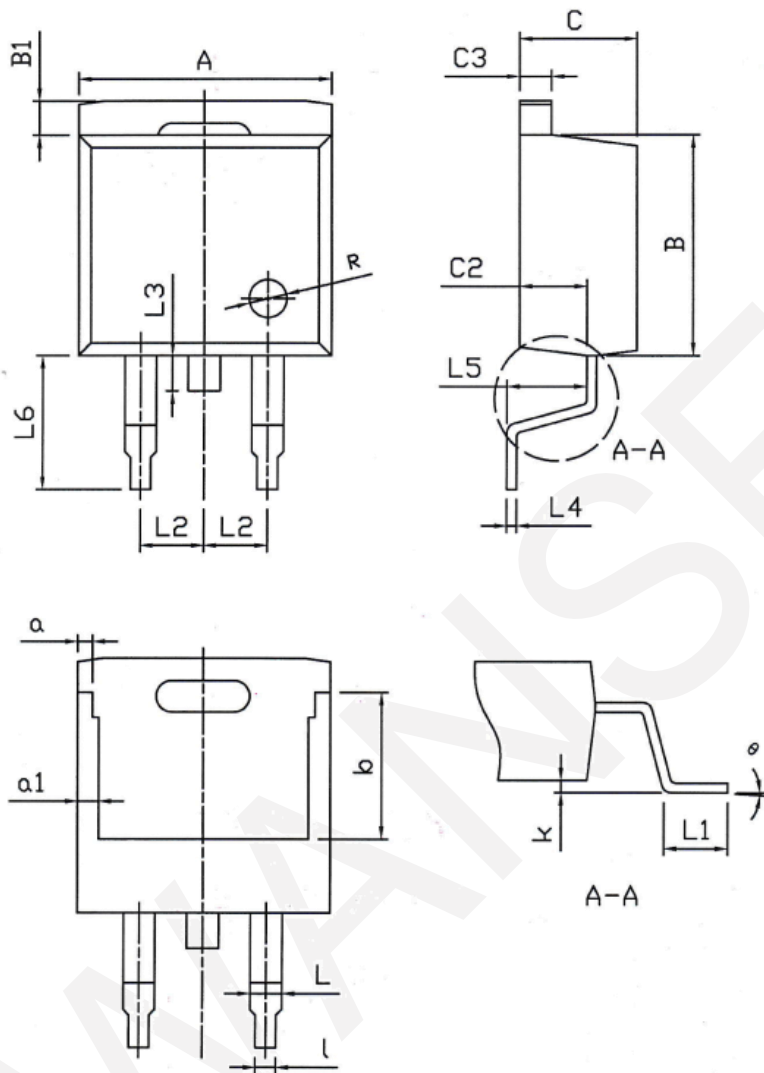
Gate Charge



Normalized Maximum Transient Thermal Impedance



**8.Package Dimensions**



Dimensions In Millimeters			
Symbol	MIN	TYP	MAX
A	10.00	10.20	10.40
B	8.50	8.70	8.90
B1	1.06	1.26	1.46
C	4.49	4.69	4.89
C2	2.54	2.69	2.84
C3	1.17	1.27	1.37
L	1.12	1.27	1.42
L1	2.34	2.54	2.74
L2	-	2.54	-
L3	1.20	1.40	1.60
L4	0.281	0.381	0.481
L5	2.54	2.79	3.04
L6	5.05	5.30	5.55
R	-	1.50	-
a	0.455	0.655	0.855
a1	0.70	0.90	1.10
b	5.648	5.798	5.948
k	0.00	-	0.25
l	0.70	0.81	0.96
θ	0°	-	9°

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