



**WANSEMI**  
万芯半导体

**WP4480**

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

**SOP8/NMOS/40V/±20V/2V/14A/11mΩ**

**Rev0.7**

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## 40V, 11mΩ, 14A, Single N-Channel

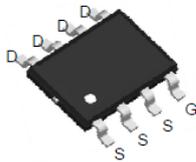
### 1.Features

- ◆ 40V MOSFET technology
- ◆ Low on-state resistance
- ◆ Fast switching
- ◆  $V_{GS} \pm 20V$

$V_{DS}$	$R_{DS(on)}$ Typ.	$I_D$
40V	11mΩ @ 10V	14A
	16mΩ @ 4.5V	

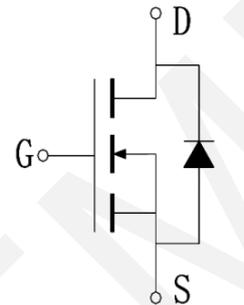
### 2.Applications

- ◆ Power Switching Application
- ◆ Load Switching



SOP8

Pin Description



Schematic Diagram

### 3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP4480	4480	SOP8	4,000	48,000

### 4.Absolute Max Ratings at $T_a=25^\circ C$ (Note1)

Parameter	Symbol	Maximum	Units
Drain to Source Voltage	$V_{DSS}$	40	V
Gate to Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current (DC)	$I_D$	14	A
Drain Current (Pulse), $PW \leq 300\mu s$	$I_{DP}$	70	A
Total Dissipation	$P_D$	3.1	W
Avalanche Energy, Single Pulsed	$E_{AS}$	56	mJ
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ C$

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 (Note 2)**

Parameter	Symbol	Value	Unit
Maximum Junction-to-Ambient	$R_{\theta JA}$	30	$^{\circ}C/W$

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

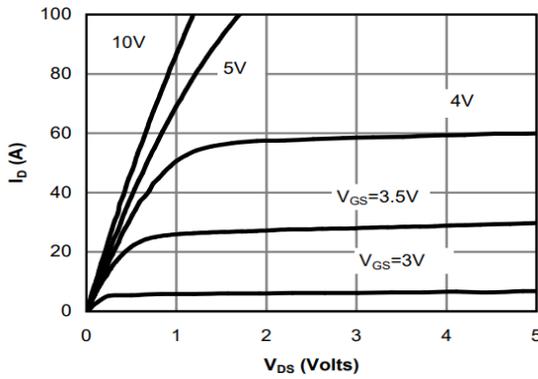
**6. Electrical Characteristics at  $T_a=25^{\circ}C$  (Note 3)**

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	40	-	-	V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 40V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_{DS} = 250\mu A$	1.2	2.0	2.5	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 14A, V_{GS} = 10V$	-	11	13	m $\Omega$
		$I_D = 5A, V_{GS} = 4.5V$	-	16	20	m $\Omega$
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = 20V,$ Frequency = 1.0MHz	-	1600	-	pF
Output Capacitance	$C_{oss}$		-	320	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	100	-	pF
Turn-ON Delay Time	$t_{d(on)}$		-	3.5	-	ns
Rise Time	$t_r$	$V_{DS} = 20V,$ $R_L = 1.5 \Omega,$ $V_{GS} = 10V,$ $R_{GEN} = 3\Omega$	-	6	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	13.2	-	ns
Fall Time	$t_f$		-	3.5	-	ns
Total Gate Charge	$Q_g$	$V_{DS} = 20V,$ $V_{GS} = 10V,$ $I_{DS} = 14A$	-	22	-	nC
	$Q_{gs}$		-	4.2	-	nC
	$Q_{gd}$		-	4.8	-	nC
Diode Forward Voltage	$V_{FSD}$	$I_S = 14A, V_{GS} = 0V$	-	0.9	1.2	V

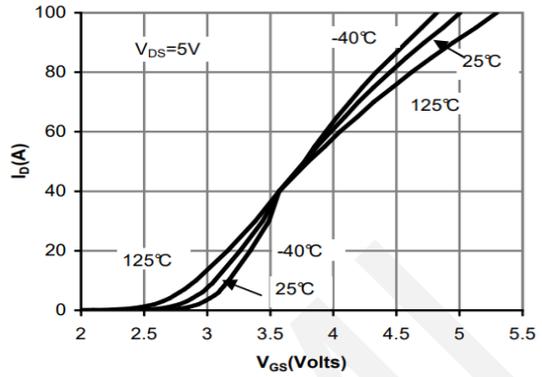
Note 3: Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.



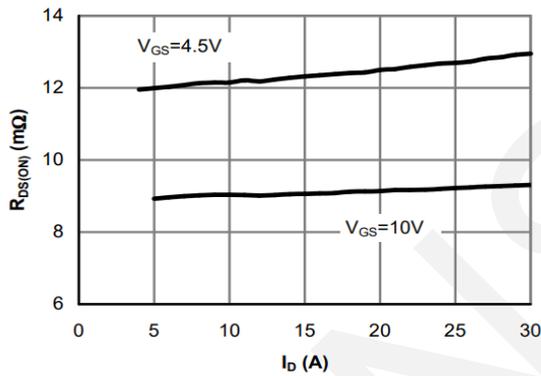
### 7. Typical electrical and thermal characteristics



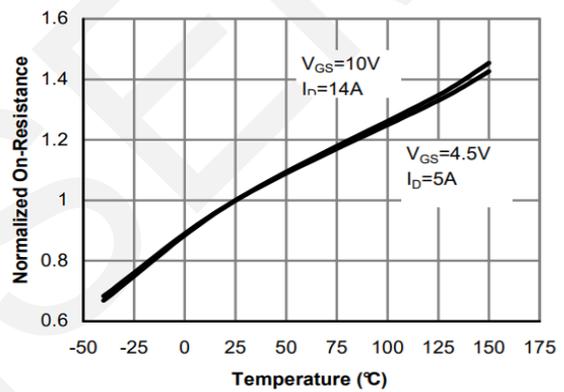
On-Region Characteristics



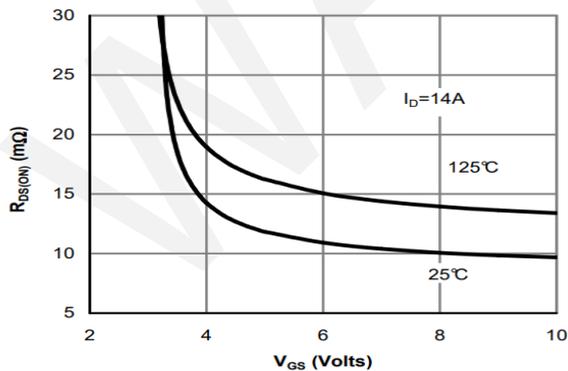
Transfer Characteristics



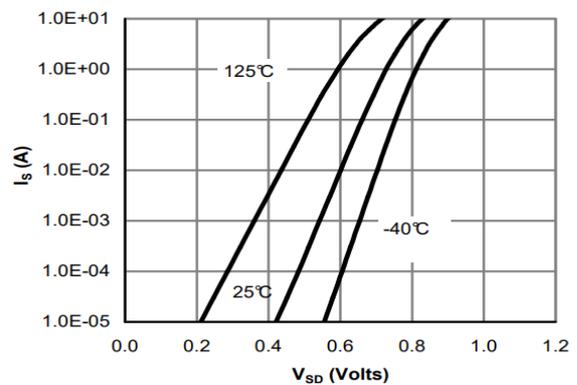
On-Resistance vs. Drain Current and Gate Voltage



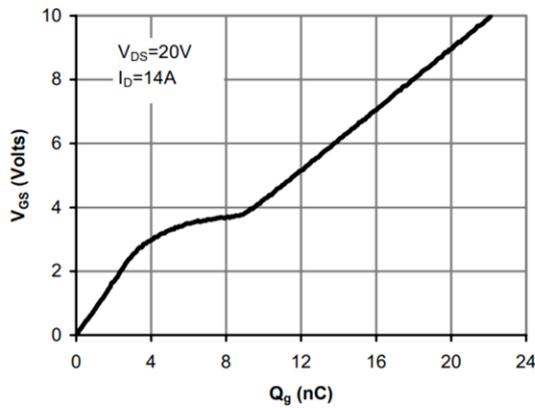
On-Resistance vs. Junction Temperature



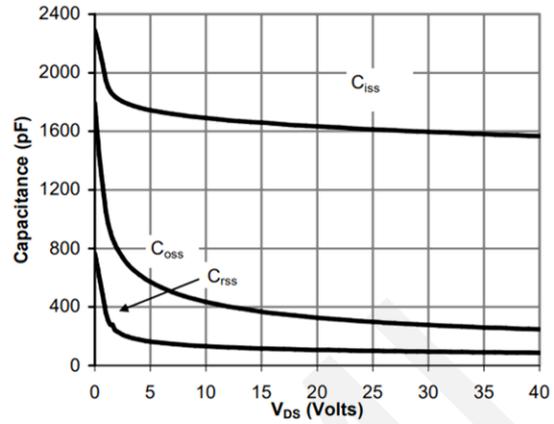
On-Resistance vs. Gate-Source Voltage



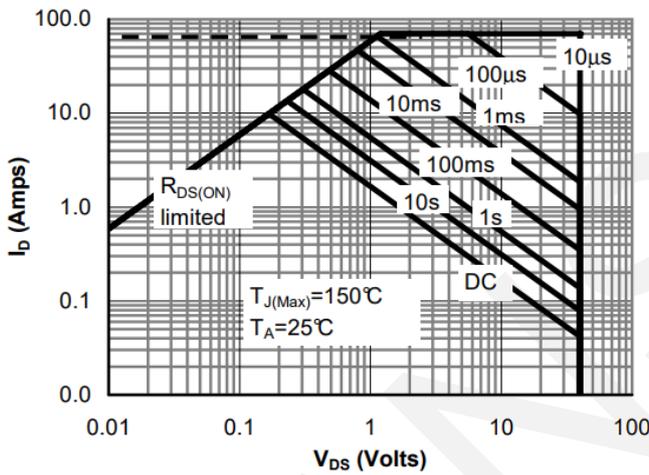
Body-Diode Characteristics



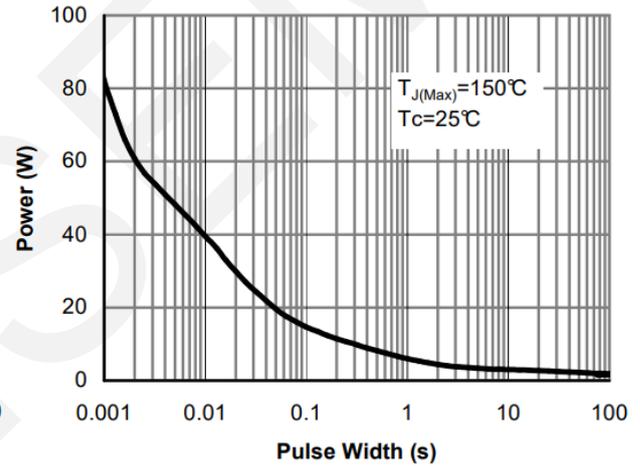
Gate-Charge Characteristics



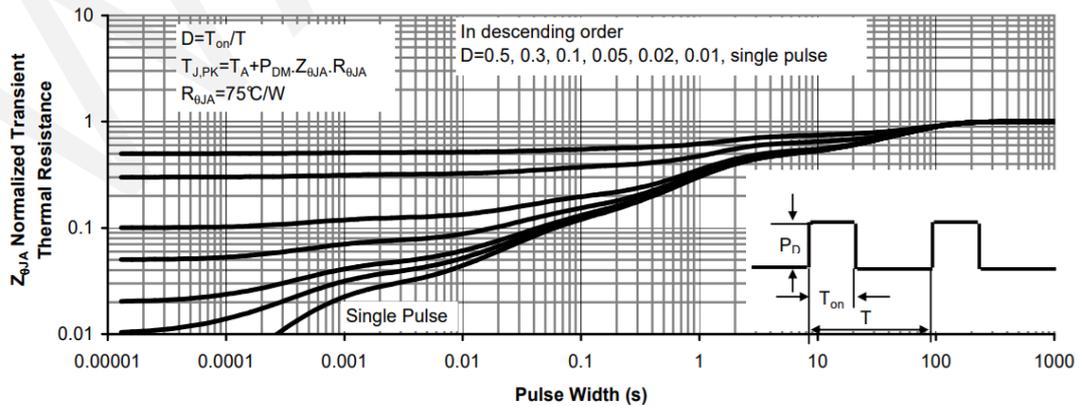
Capacitance Characteristics



Maximum Forward Biased Safe  
Operating Area



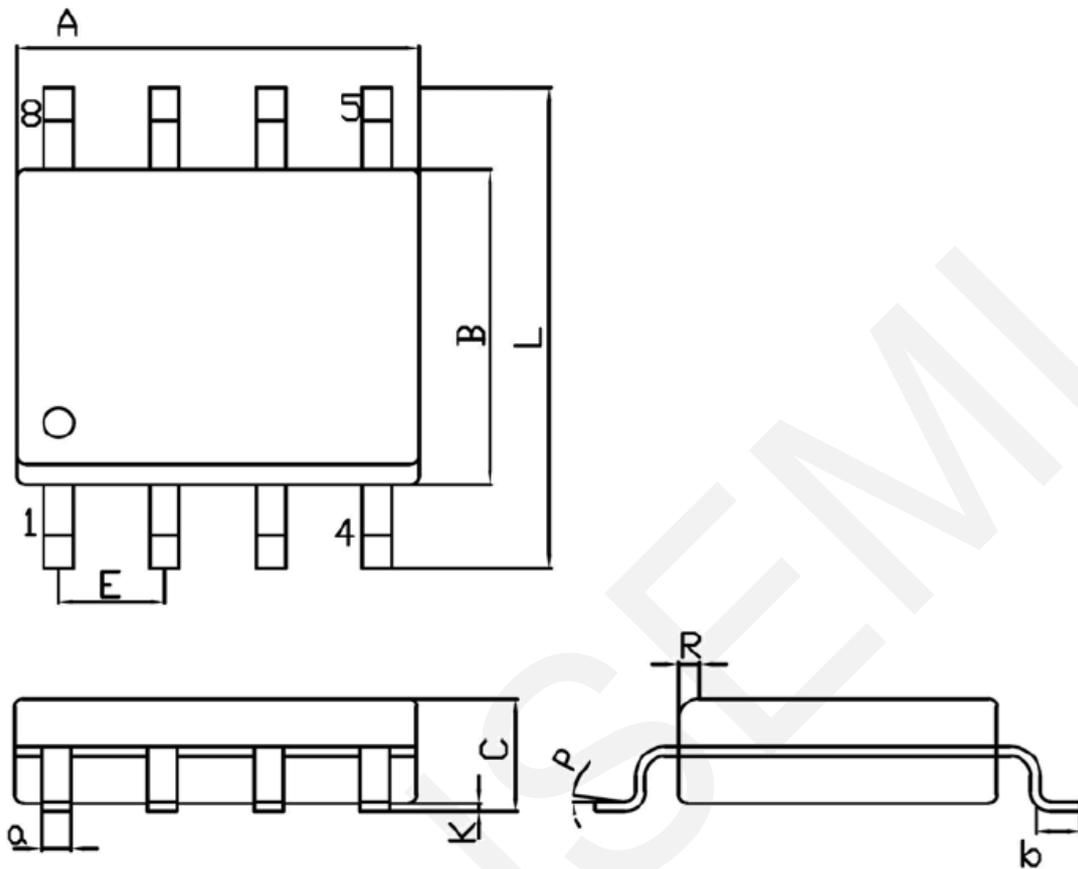
Single Pulse Power Rating Junction-to-  
Ambient



Normalized Maximum Transient Thermal  
Impedance



**8.Package Dimensions**



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.70	5.10	C	1.35	1.75
B	3.70	4.10	a	0.35	0.49
L	5.80	6.20	R	0.30	0.60
E	1.27BSC		P	0°	7°
K	0.12	0.22	b	0.40	1.25

## 9. Important Notice

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