

N-channel Enhancement Mode Power MOSFET

Features

- Ultra-low $R_{DS(ON)}$
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant
- Split-Gate Trench
- 100% UIS TESTED!, 100% R_g TESTED!

Product Summary

Parameters	Value	Unit
V_{DSS}	30	V
$V_{GS(th)_{Typ}}$	1.79	V
$I_D(@V_{GS}=10V)$	180	A
$R_{DS(ON)_{Typ}}(@V_{GS}=10V)$	1.34	m Ω
$R_{DS(ON)_{Typ}}(@V_{GS}=4.5V)$	2.02	m Ω

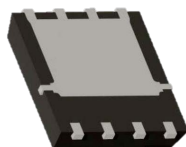
Applications

- Power Management in Computing, CE, IE 4.0, Communications
- Current Switching in DC/DC & AC/DC Sub-systems
- Moto Driving, Quick/Wireless Charging

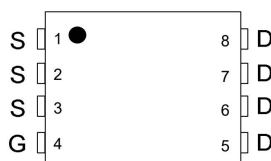
Top View



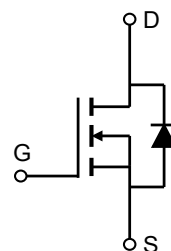
Bottom View



PDFN5x6-8L



Marking



Schematic Diagram

Ordering Information

Device	Marking	Package	Packing	Reel Size	Tape Width	Reel (pcs)
ZK30G180G	30G180	PDFN5x6	Reel	N/A	N/A	5000

MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	180	A
	$T_C = 100^{\circ}\text{C}$		112	
Pulsed Drain Current		I_{DM}	485	A
Single Pulsed Avalanche Energy		E_{AS}	101	mJ
Power Dissipation		P_D	78	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	65	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^{\circ}\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS

$T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D = 1mA	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 30V, V _{GS} =0V			1.0	μA
Gate-body leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} =±20V			±100	nA
On characteristics ④						
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.2	1.79	2.2	V
Static drain-source on-sate resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		1.34	1.41	mΩ
		V _{GS} =4.5V, I _D =15A		2.02	2.17	mΩ
Dynamic characteristics ④ ⑤						
Input capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V f =1MHz		2975		pF
Output capacitance	C _{oss}			2650		
Reverse transfer capacitance	C _{rss}			117		
Gate Resistance	R _g	f =1MHz		1.4		Ω
Switching characteristics ④ ⑤						
Total gate charge	Q _g	V _{GS} =0 to 10V V _{DS} =15V, I _D =20A		39		nC
Gate-source charge	Q _{gs}			8.6		
Gate-drain charge	Q _{gd}			5.0		
Turn-on delay time	t _{d(on)}	V _{DS} =15V, R _L =0.75Ω V _{GS} =10V, R _{GEN} =3Ω		6.0		ns
Turn-on rise time	t _r			9.0		
Turn-off delay time	t _{d(off)}			26		
Turn-off fall time	t _f			10.0		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V _{SD} ④	V _{GS} =0V, I _S =1A		0.68	1.2	V
Continuous drain-source diode forward current	I _S ①	T _C =25℃			80	A
Reverse recovery time	trr	di/dt = 100A/μs, I _F = 20A		51		ns
Reverse recovery charge	Qrr			57		nC

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under $T_{J_Max} = 150^\circ C$.
3. This single-pulse measurement was taken under the following condition [$L = 100\mu H, V_{DS} = 10V, V_{GS} = 30V$] while its value is limited by $T_{J_Max} = 150^\circ C$.
4. The power dissipation P_0 is based on $T_{J_Max} = 150^\circ C$.
5. This value is guaranteed by design hence it is not included in the production test.

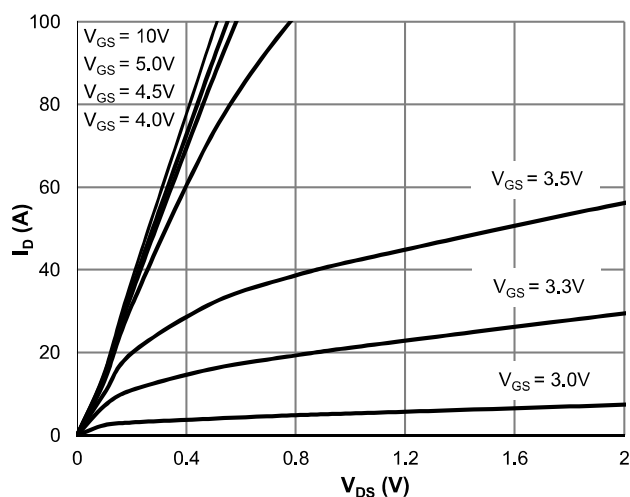


Figure 1: Saturation Characteristics

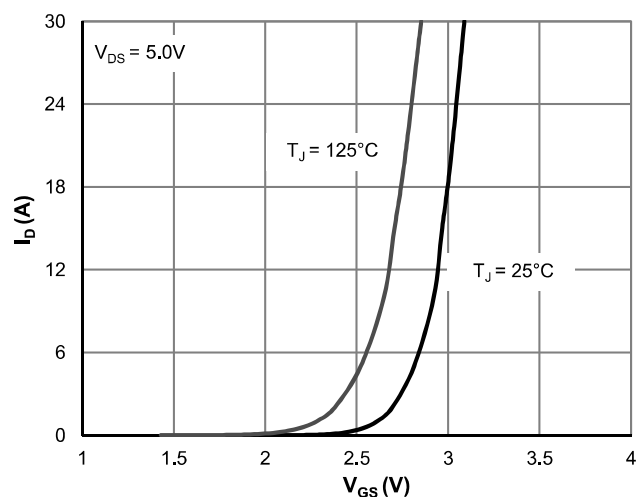


Figure 2: Transfer Characteristics

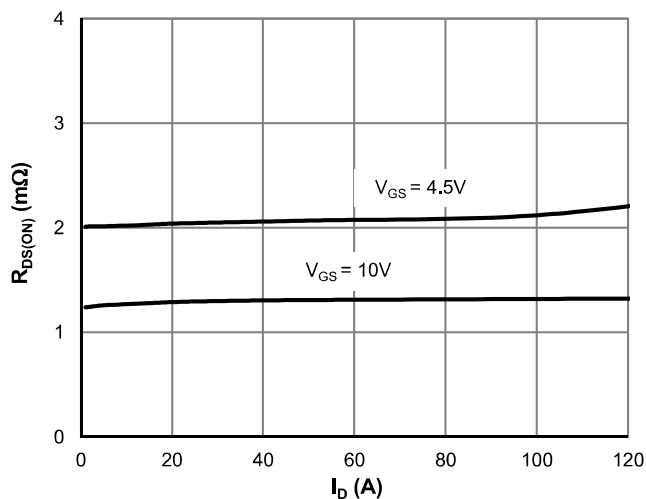


Figure 3: $R_{DS(ON)}$ vs. Drain Current

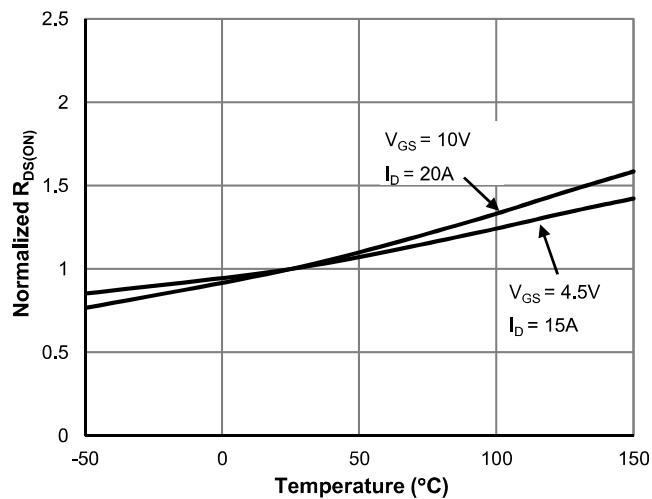


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

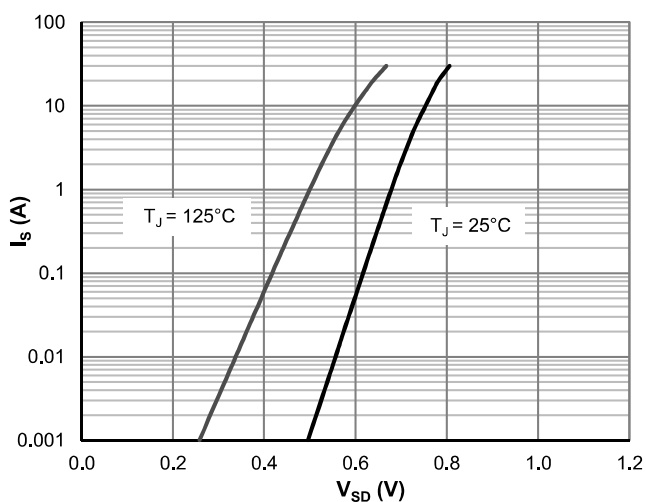


Figure 5: Body-Diode Characteristics

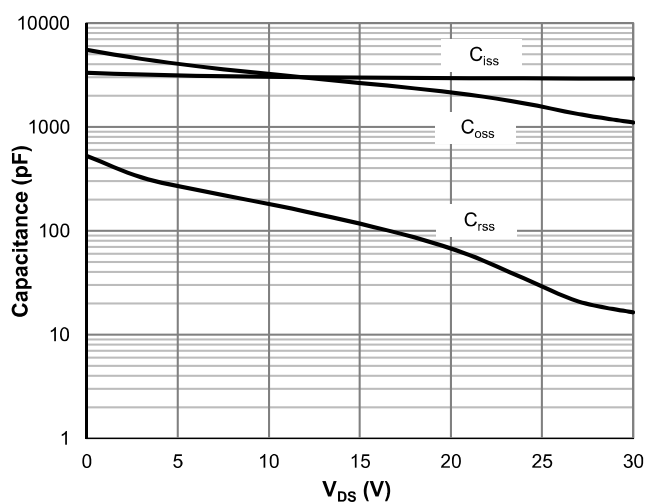


Figure 6: Capacitance Characteristics

Typical Electrical & Thermal Characteristics

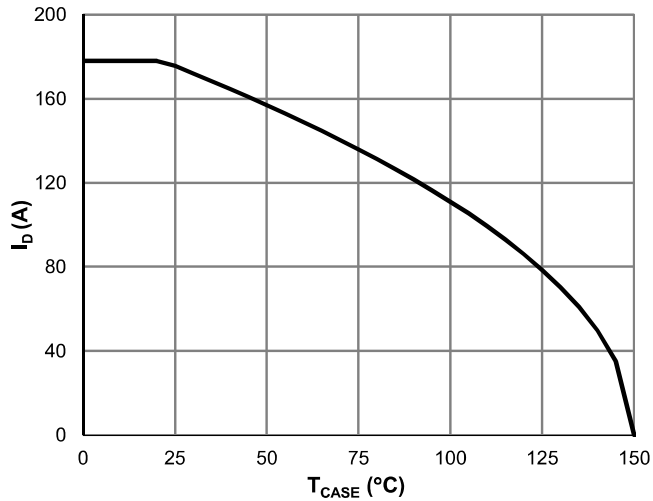


Figure 7: Current De-rating

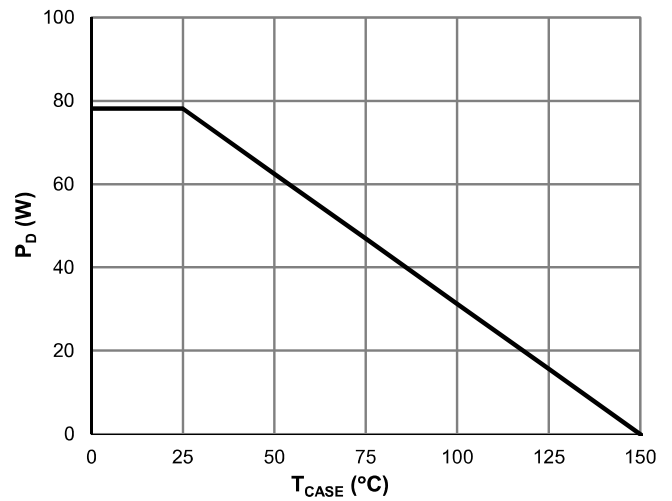


Figure 8: Power De-rating

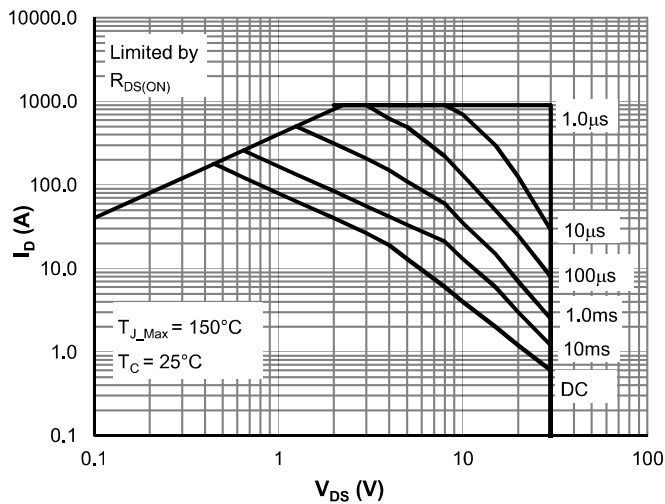


Figure 9: Maximum Safe Operating Area

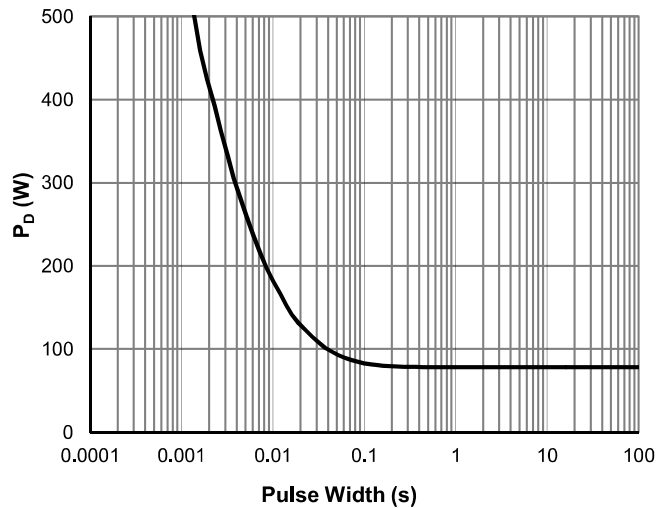


Figure 10: Single Pulse Power Rating, Junction-to-Case

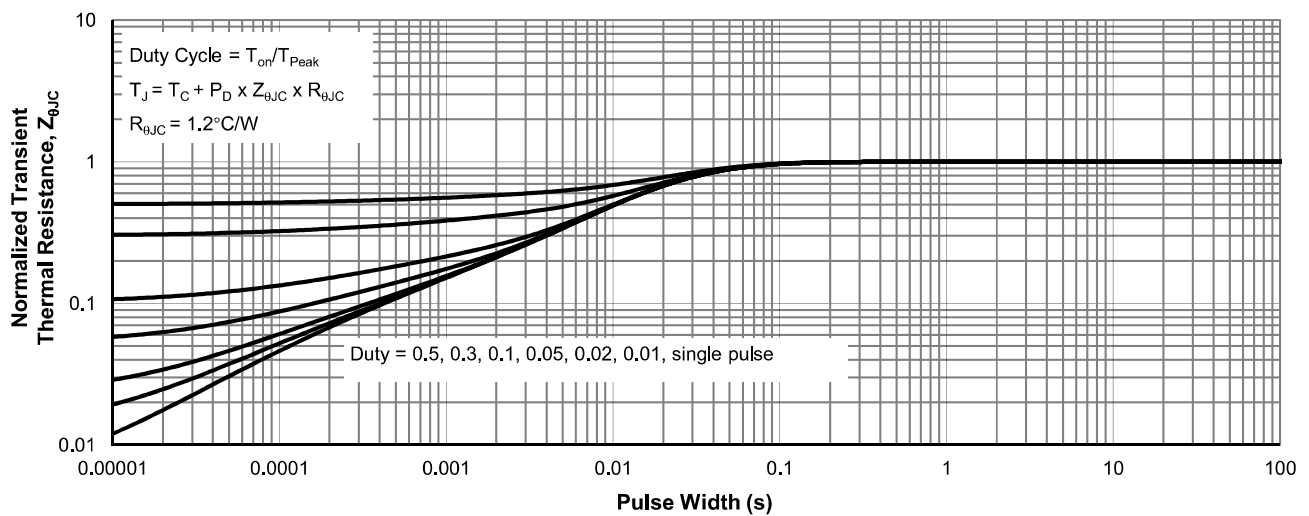
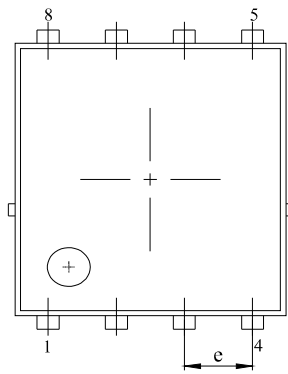
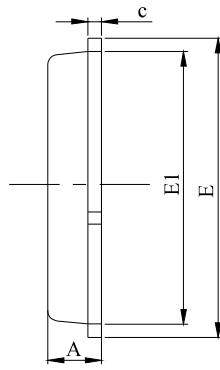


Figure 11: Normalized Maximum Transient Thermal Impedance

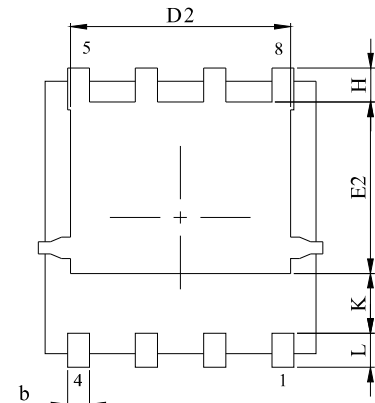
PDFN5x6-8L Package Information



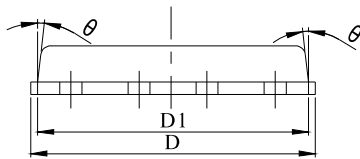
Top View



Side View



Bottom View



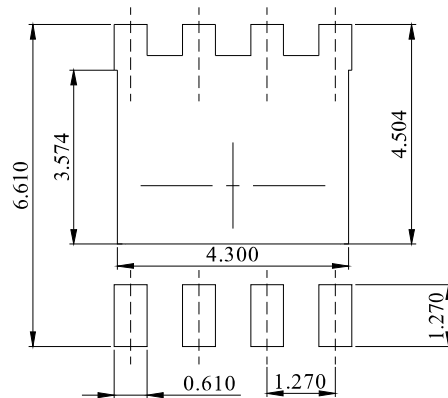
Front View

NOTES:

1. Dimension and tolerance per ASME Y14.5M, 1994.
2. All dimensions in millimeter (angle in degree).
3. Dimensions D1 and E1 do not include mold flash protrusions or gate burrs.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.31	0.41	0.51
c	0.20	0.25	0.30
D	5.00	5.20	5.40
D1	4.95	5.05	5.15
D2	4.00	4.10	4.20
E	6.05	6.15	6.25
E1	5.50	5.60	5.70
E2	3.42	3.53	3.63
e	1.27BSC		
H	0.60	0.70	0.80
L	0.50	0.70	0.80
K	1.23 REF		
θ	-	-	10°

Recommended Soldering Footprint



DIMENSIONS:MILLIMETERS