

P-channel Enhancement Mode Power MOSFET

Features

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired
- 100% UIS TESTED!
- 100% ΔV_{ds} TESTED!

Applications

- Load Switch
- PWM Application
- Power Management

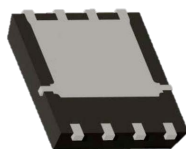
Product Summary

Parameters	Value	Unit
V_{DSS}	-40	V
$V_{GS(th)_{Typ}}$	-1.7	V
$I_D(@V_{GS}=-10V)$	-80	A
$R_{DS(ON)_{Typ}} @V_{GS}=-10V$	7.5	m Ω
$R_{DS(ON)_{Typ}} @V_{GS}=-4.5V$	10	m Ω

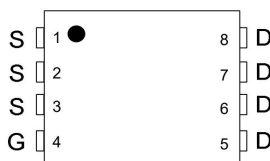
Top View



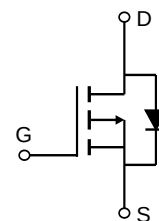
Bottom View



PDFN5x6-8L



Marking



Schematic Diagram

Ordering Information

Device	Marking	Package	Packing	Reel Size	Tape Width	Reel (pcs)
ZK40P80G	40P80	PDFN5x6	Reel	N/A	N/A	2000

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-40	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	-80	A
	$T_C = 100^{\circ}\text{C}$		-56	
Pulsed Drain Current		I_{DM}	-280	A
Single Pulsed Avalanche Energy		E_{AS}	182	mJ
Power Dissipation		P_D	90	W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	1.7	$^{\circ}\text{C/W}$
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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -32V, V_{GS} = 0V$			-1.0	μA
Gate-body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
On characteristics						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.7	-2.5	V
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -30A$		7.5	9.2	m Ω
		$V_{GS} = -4.5V, I_D = -30A$		10.0	13	m Ω
Dynamic characteristics						
Input capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = 0V$ f = 1MHz		6650		pF
Output capacitance	C_{oss}			530		
Reverse transfer capacitance	C_{rss}			287		
Gate resistance	R_g	f = 1MHz		4.2		Ω
Switching characteristics						
Total gate charge	Q_g	$V_{GS} = 0 \text{ to } -10V$ $V_{DS} = -20V, I_D = 20A$		115		nC
Gate-source charge	Q_{gs}			23		
Gate-drain charge	Q_{gd}			20		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -20V, I_D = -20A$ $V_{GS} = -10V, R_{GEN} = 3\Omega$		15		ns
Turn-on rise time	t_r			88		
Turn-off delay time	$t_{d(off)}$			122		
Turn-off fall time	t_f			101		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V_{SD}	$V_{GS} = 0V, I_S = -30A$			-1.2	V
Continuous drain-source diode forward current	I_S				-70	A
Pulsed drain-source diode forward current	I_{SM}				-280	A
Reverse recovery time	t_{rr}	$di/dt = 100A/\mu s, I_S = -20A$		25		ns
Reverse recovery charge	Q_{rr}			17		nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J = 25^\circ\text{C}$, $V_{DD} = -20V$, $V_G = -10V$, $L = 0.5mH$, $R_G = 25\Omega$, $I_{AS} = -27A$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Figure 1: Output Characteristics

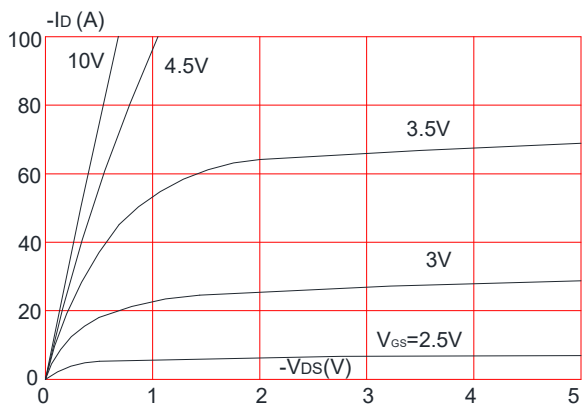


Figure 2: Typical Transfer Characteristics

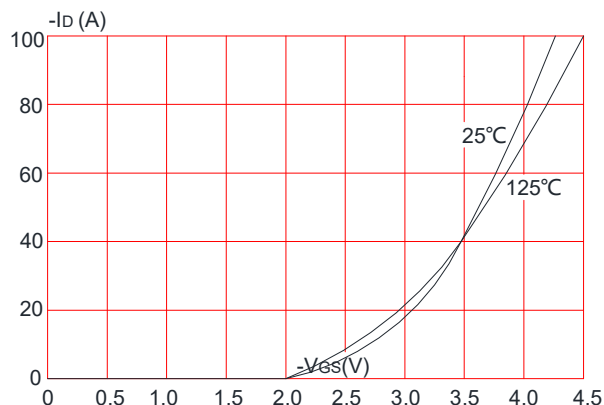


Figure 3: On-resistance vs. Drain Current

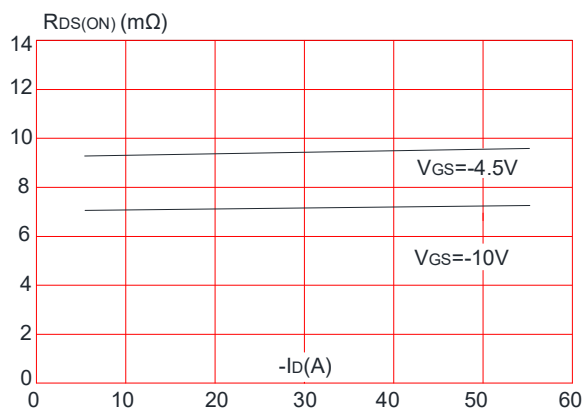


Figure 4: Body Diode Characteristics

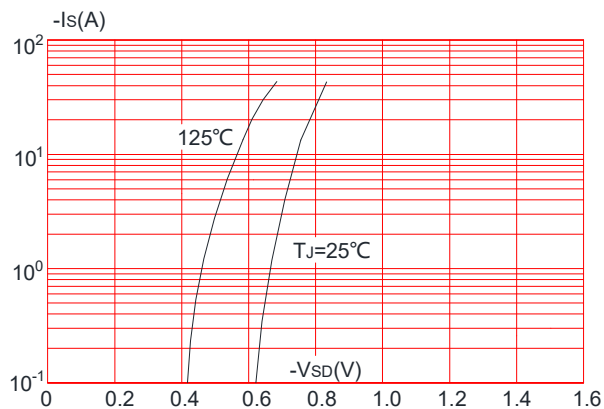


Figure 5: Gate Charge Characteristics

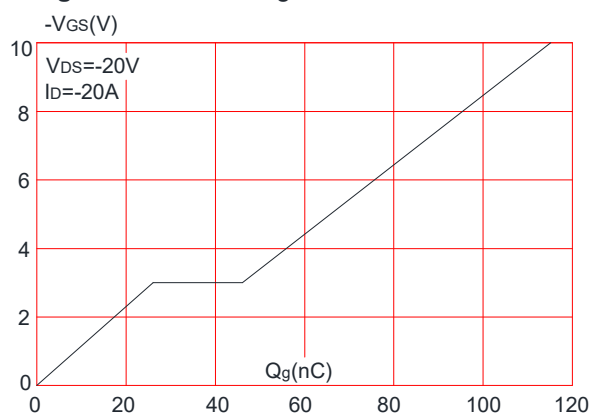
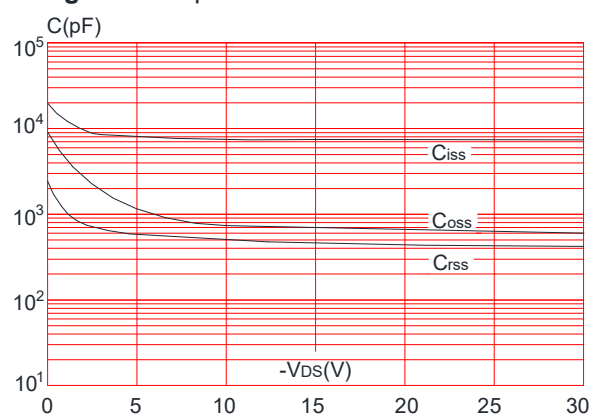


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

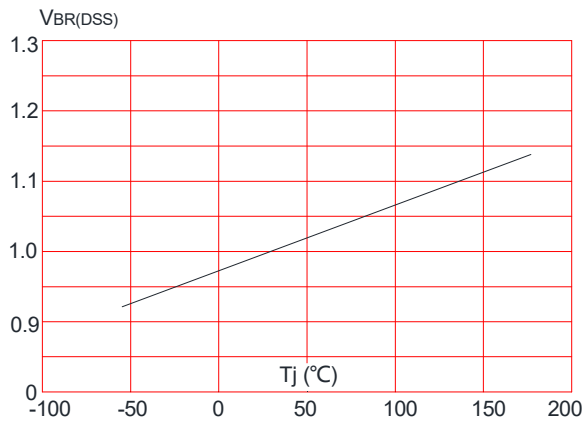


Figure 8: Normalized on Resistance vs. Junction Temperature

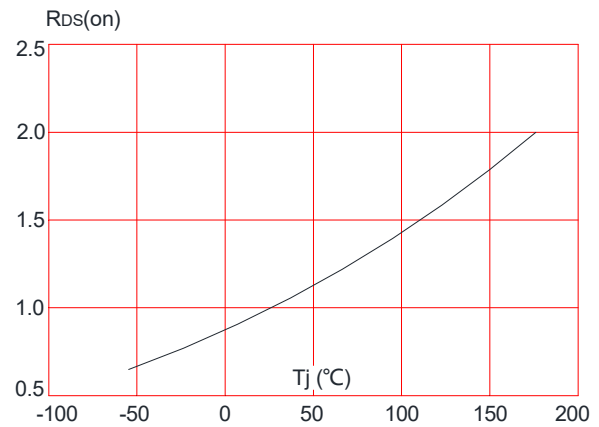


Figure 9: Maximum Safe Operating Area

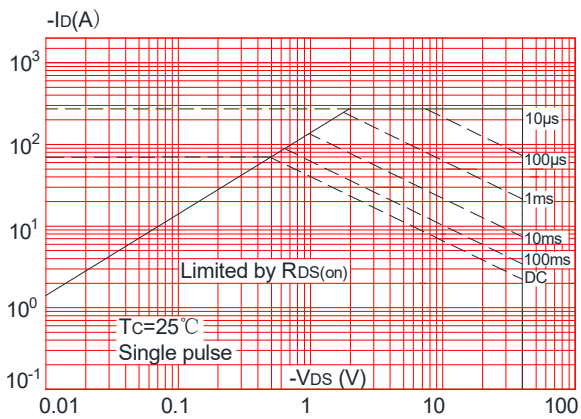


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

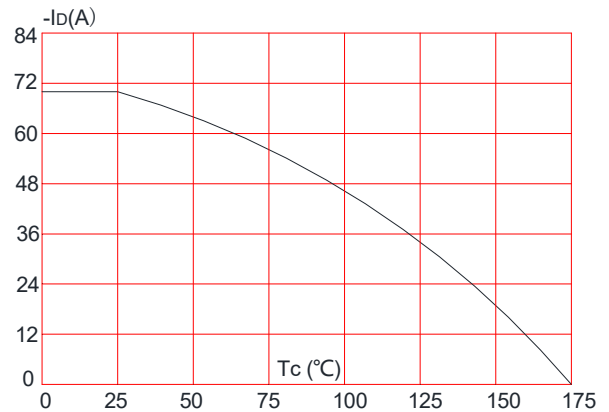
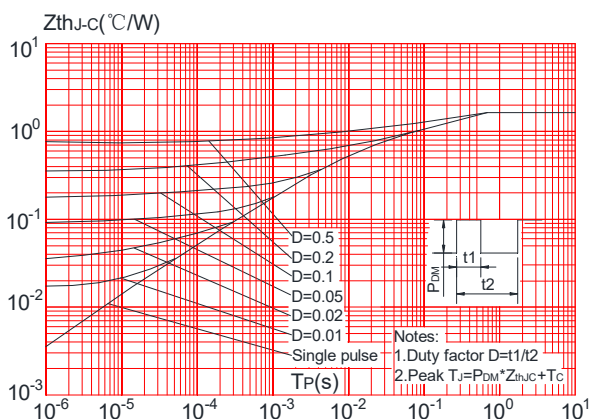
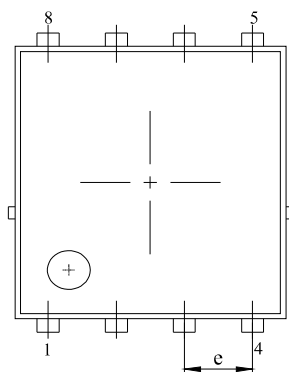
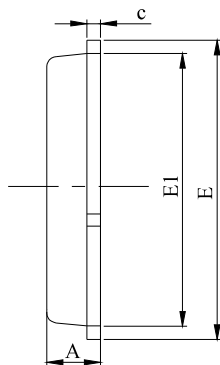


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

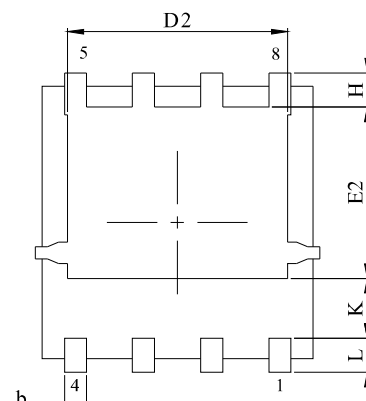




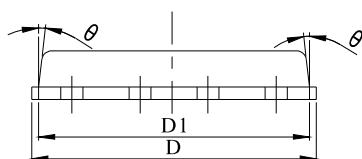
Top View



Side View



Bottom View



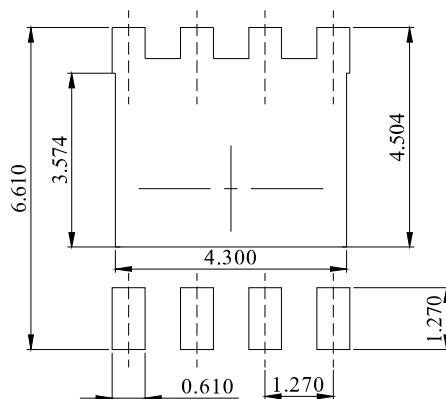
Front View

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