ZK30G160GA

N-channel Enhancement Mode Power MOSFET

Features

- Uses advanced SGT technology
- Extremely low on-resistance RDS(on)
- Excellent gate charge x RDS(on) product(FOM)

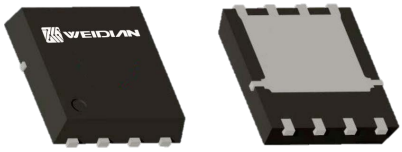
Product Summary

Parameters	Value	Unit
V_{DSS}	30	V
$V_{GS(th)_Typ}$	2.7	V
I_D(@V_{GS}=10V)	178	A
$R_{DS(ON)_Typ}$(@V_{GS}=10V	1.65	mΩ
$R_{DS(ON)_Typ}$(@V_{GS}=4.5V	-	mΩ

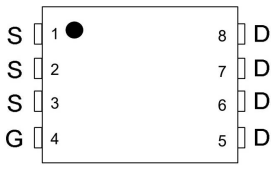
Applications

- Motor control and drive
- Battery management
- DC/DC

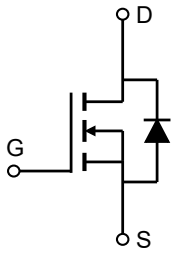
Top View **Bottom View**



PDFN5x6-8L



Marking



Schematic Diagram

Ordering Information

Device	Marking	Package	Packing	Reel Size	Tape Width	Reel (pcs)
ZK30G160GA	30G160	PDFN5x6	Reel	N/A	N/A	5000

MAXIMUM RATINGS (T_a=25℃ 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°C	I_D	178	A
	T_C = 100°C		110	
Pulsed Drain Current		I_{DM}	400	A
Single Pulsed Avalanche Energy		E_{AS}	101	mJ
Power Dissipation		P_D	100	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	-	℃/W
Operating Junction and Storage Temperature Range		T_J ,T_{stg}	-55 to 150	℃

MOSFET ELECTRICAL CHARACTERISTICS

T_a=25℃ 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	2	2.7	3.5	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		1.65	1.8	mΩ
		V_{GS} =4.5V, I_D =15A		-		mΩ
Dynamic characteristics ④⑤						
Input capacitance	C_{iss}	V_{DS} =15V,V_{GS} =0V f =1MHz		2800		pF
Output capacitance	C_{oss}			1220		
Reverse transfer capacitance	C_{rss}			69		
Gate Resistance	R_g	V_{DS} =0V,V_{GS} =0V f =1MHz		7.9		Ω
Switching characteristics ④⑤						
Total gate charge	Q_g	V_{GS}=0 to 10V V_{DS}=15V, I_D=20A		39		nC
Gate-source charge	Q_{gs}			6.9		
Gate-drain charge	Q_{gd}			6.9		
Turn-on delay time	$t_{d(on)}$	V_{DS}=15V,R_L=0.75Ω V_{GS}=10V,R_{GEN}=3Ω		5		ns
Turn-on rise time	t_r			7		
Turn-off delay time	$t_{d(off)}$			26		
Turn-off fall time	t_f			5		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V_{SD} ④	V_{GS} =0V, I_S=1A			1.2	V
Continuous drain-source diode forward current	I_S ①	T_C =25℃				A
Reverse recovery time	trr	di/dt = 100A/μs, I_F = 20A		14		ns
Reverse recovery charge	Qrr			21		nC

Notes:

1.Computed continuous current assumes the condition of TJ_Max while the actual continuous current depends on the thermal & electro-mechanical application board design.

2.This single-pulse measurement was taken under TJ_Max = 150°C.

3.This single-pulse measurement was taken under the following condition [L = 100μH, V08 = 10V, V08 = 30V] while its value is limited byT_{J_Max} = 150°C.

4.The power dissipation P0 is based on T J_Max = 150°C.

5.This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

Diagram 1: Power dissipation

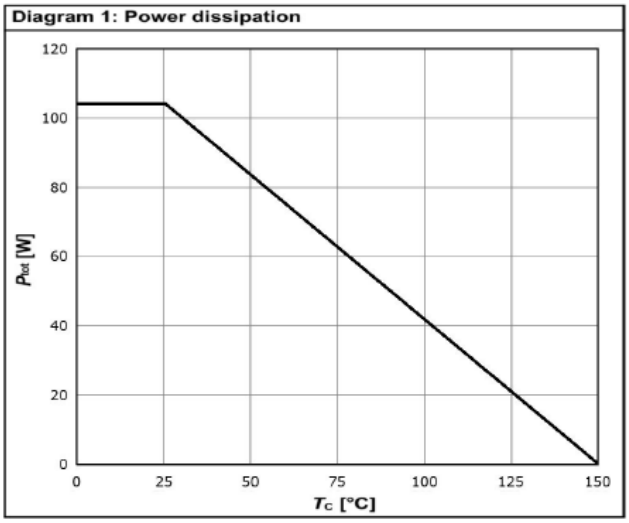


Diagram 2: Drain current

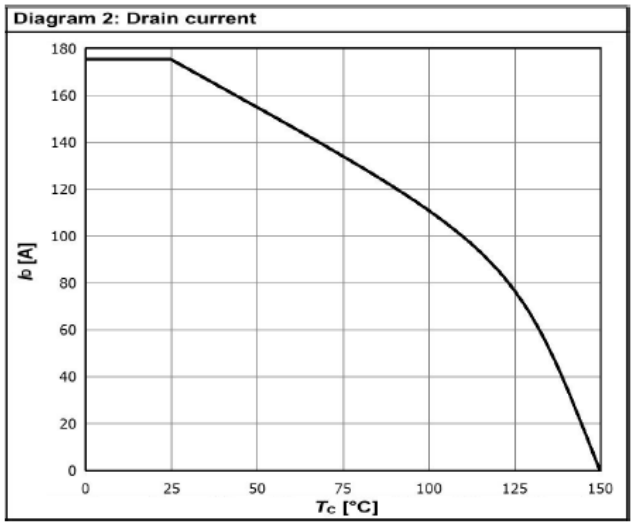


Diagram 3: Safe operating area

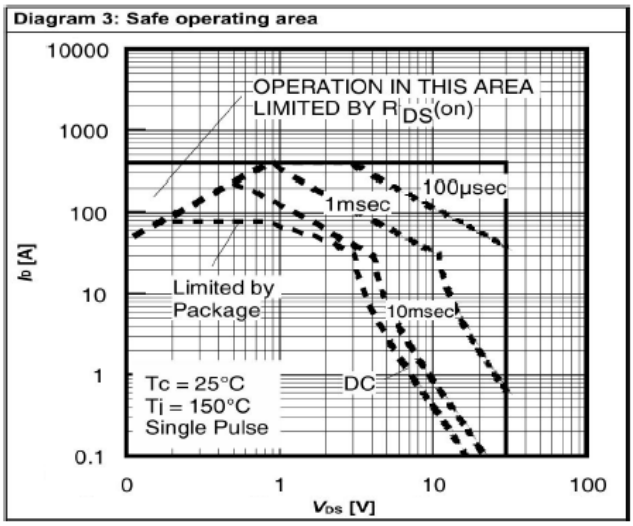


Diagram 4: Max. transient thermal impedance

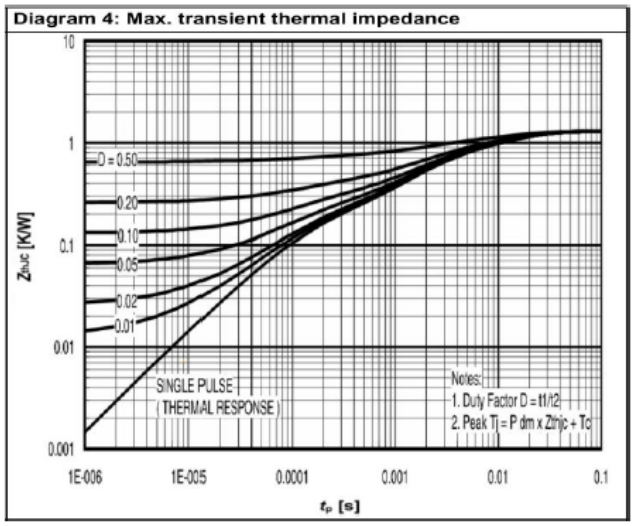


Diagram 5: Typ. output characteristics

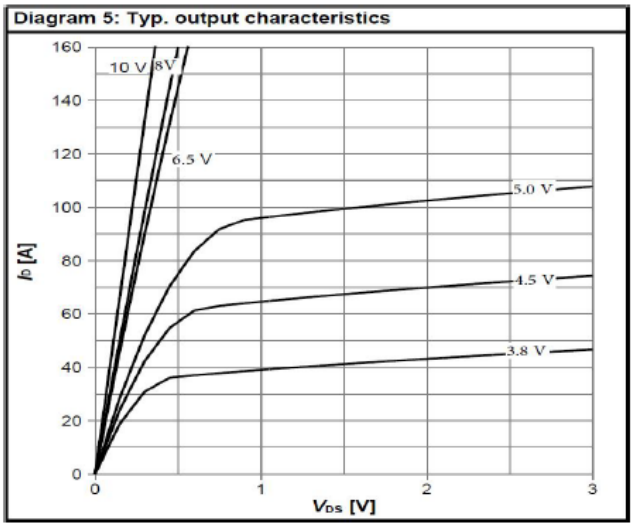
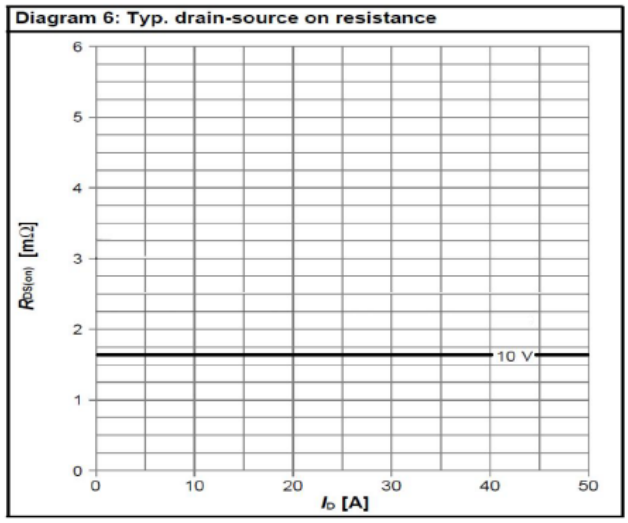


Diagram 6: Typ. drain-source on resistance



Typical Electrical & Thermal Characteristics

Diagram 7: Typ. transfer characteristics

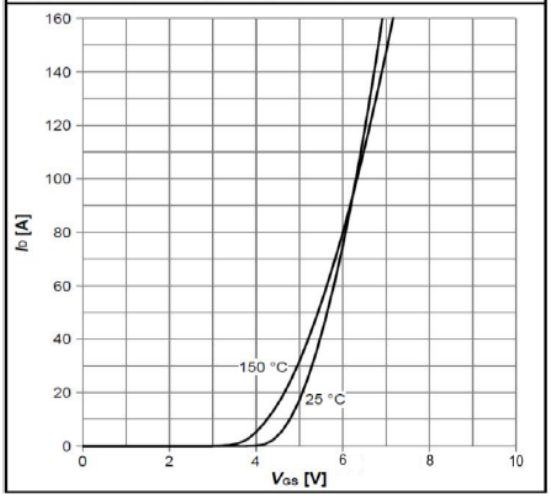


Diagram 8: Drain-source on-state resistance

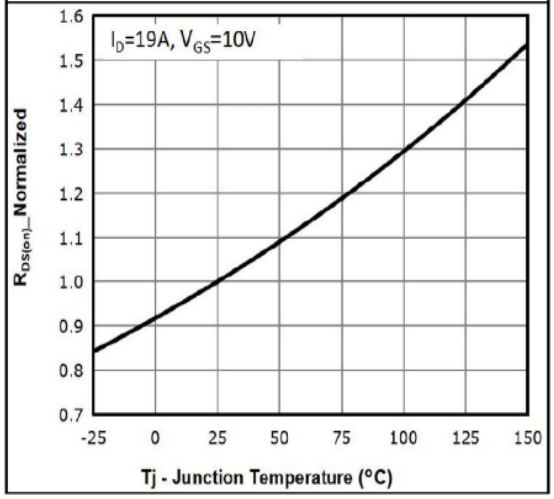


Diagram 9: Forward characteristics of reverse diode

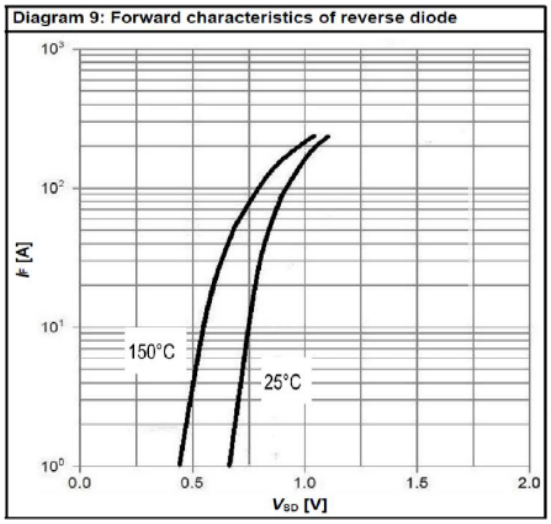


Diagram 10: Typ. gate charge

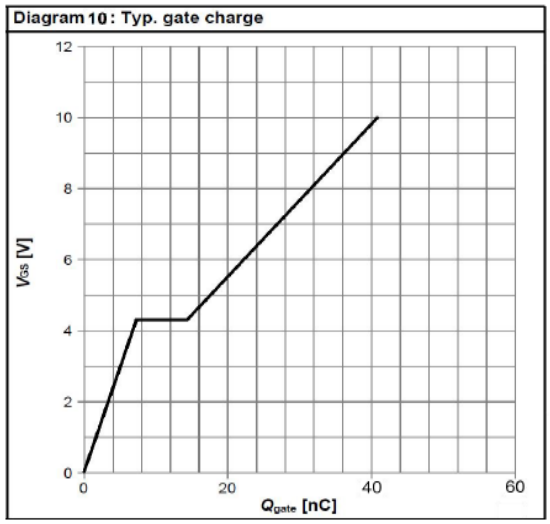
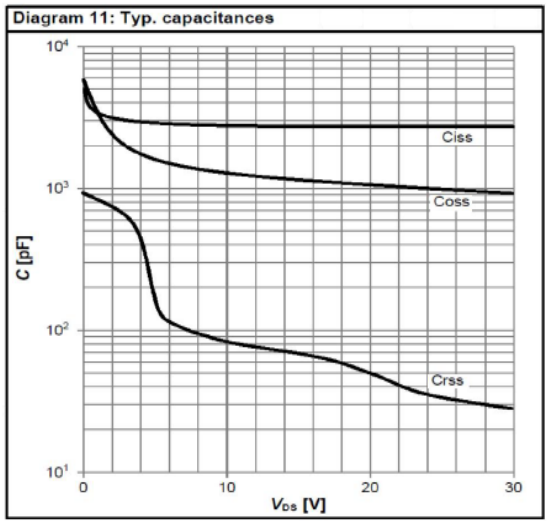
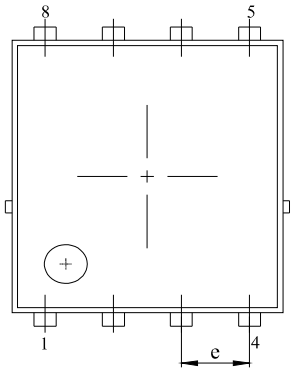
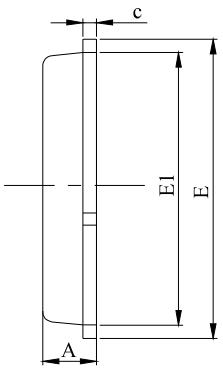


Diagram 11: Typ. capacitances

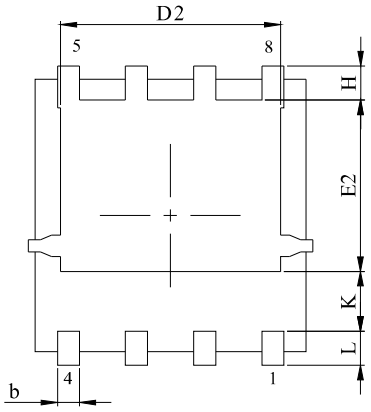




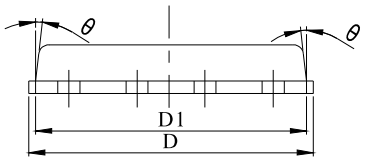
Top View



Side View



Bottom View



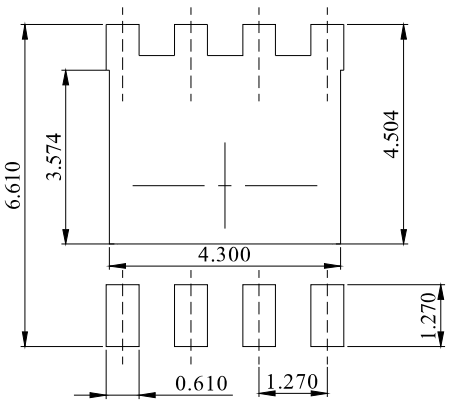
Front View

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