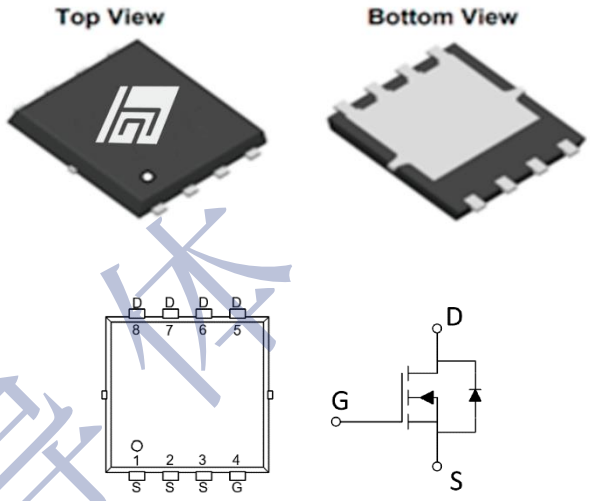
40V_{DS}/±20V_{GS} N-Channel EpicSGT MOSFET

Features

- V_{DS}=40V,I_D=69A
- $R_{DS(ON)}$= 3.9mΩ（TYP.）V_{GS}=10V,I_D=20A
- $R_{DS(ON)}$=5mΩ（TYP.）V_{GS}=4.5V,I_D=20A
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance
- High Current Capability
- Halogen and Antimony Free,Rohs compliant

PDFN5060



Applications

- Load Switch
- Power management in portable/desktop PCs
- DC/DC conversion

Ordering Information

Orderable Device	Package	Marking information	Package Qty.
AER4051AE	PDFN5060	AER4051AE ywwFxxx	5000pcs/Reel

Absolute Maximum Ratings (Ta=25℃,unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_C=25℃)	I_D	69	A
Continuous Drain Current (T_C=100℃)		50	A
Pulsed Drain Current	I_{DM}	200	A
Avalanche Current(L=0.1mH)	I_{AS}	40	A
Single Pulsed Avalanche Energy	E_{AS}	80	mJ
Maximum Power Dissipation (T_C =25℃)	P_D	48	W
Maximum Power Dissipation (T_C =100℃)		20	W
Operating,Storage Temperature Range	T_J,T_{STG}	-55~150	℃

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	-	2.6	-	℃/ W
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	-	54	-	℃/ W

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V	-	-	1	μA
Gate -Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS},I_D=250μA	1.0	1.5	2.0	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=20A	-	3.9	5.2	mΩ
		V_{GS}=4.5V,I_D=20A	-	5	6.5	

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	V_{DS}=20V	-	1087	-	pF
Output capacitance	C_{oss}	V_{GS}=0V	-	314	-	
Reverse transfer capacitance	C_{rss}	f=1MHz	-	19	-	
Gate Resistance	R_g	f=1MHz	-	1.1	-	Ω
Total Gate Charge	Q_g	V_{DS}=20V	-	21	-	nC
Gate Source Charge	Q_{gs}	V_{GS}=10V	-	4.3	-	
Gate Drain Charge	Q_{gd}	I_D=20A	-	4	-	
Turn-on delay Time	$t_{d(on)}$	V_{GS}=10V	-	4.7	-	ns
Rise time	t_r	V_{DS}=20V	-	41.5	-	
Turn-off delay Time	$t_{d(off)}$	I_D=20A	-	22	-	
Fall time	t_f	R_G=3Ω	-	8	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=1A	-	0.7	1	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_{SD}=20A	-	16	-	ns
Reverse Recovery Charge	Q_{rr}	d_i/d_t=100A/μs	-	4	-	nC

Electrical Characteristics Diagrams

Figure 1. On-Region Characteristics

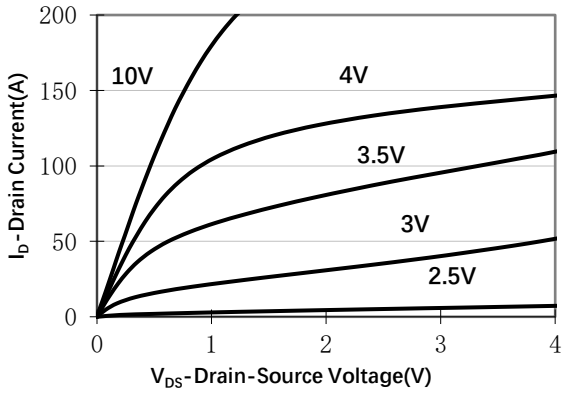


Figure 2. Transfer Characteristics

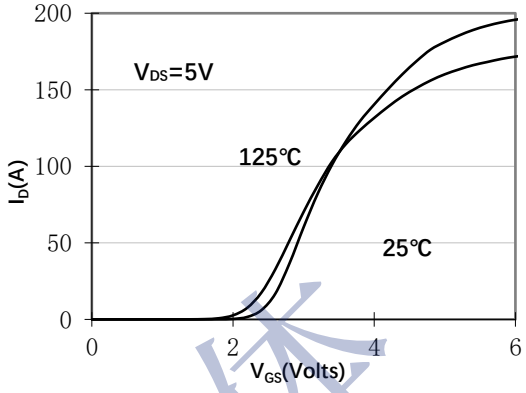


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

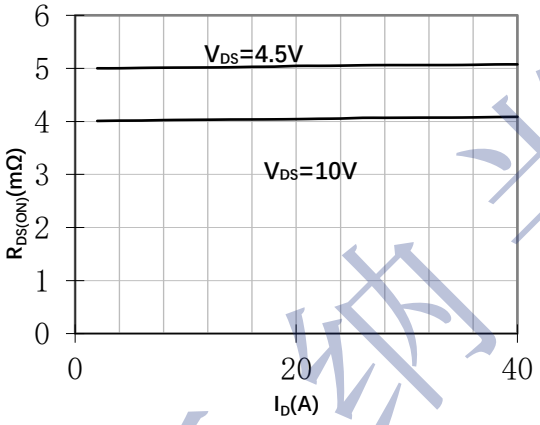


Figure 4. On-Resistance vs. Junction Temperature

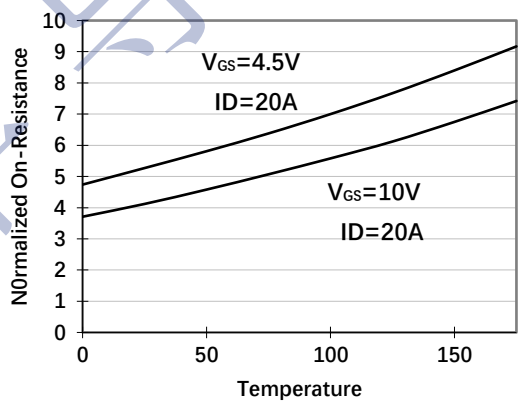


Figure 5. On-Resistance vs. Gate-Source Voltage

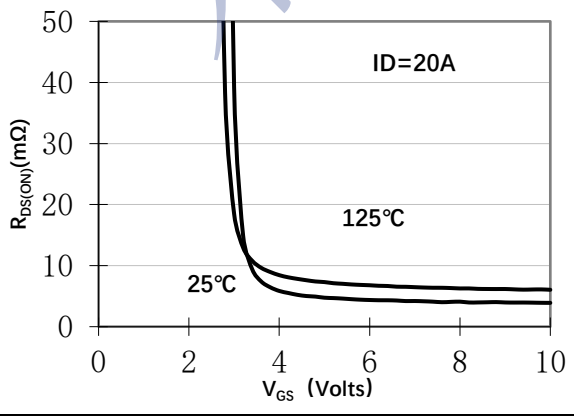


Figure 6. Body-Diode Characteristics

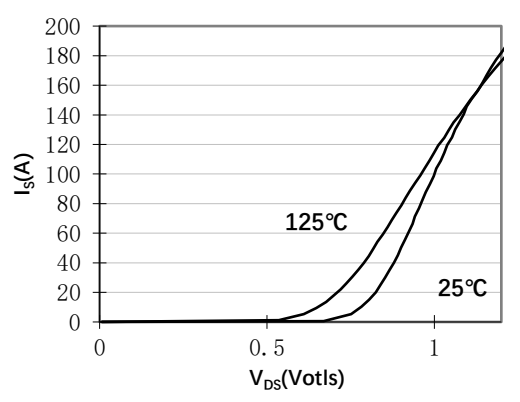


Figure 7. Gate-Charge Characteristics

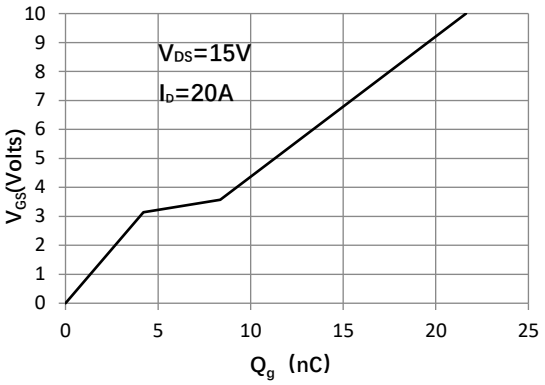


Figure 8. Capacitance Characteristics

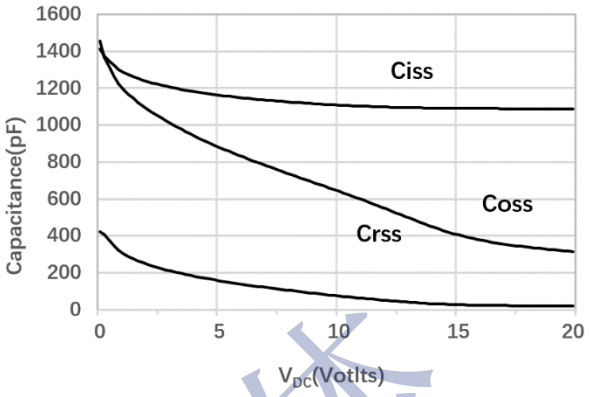


Figure 9. Maximum Forward Biased Safe Operating Area

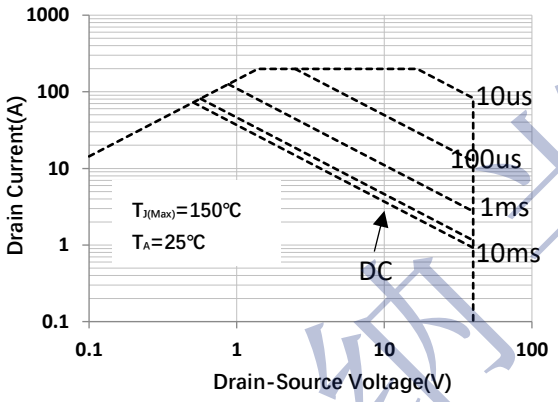


Figure 10. Single Pulse Power Rating Junction-to-Ambient

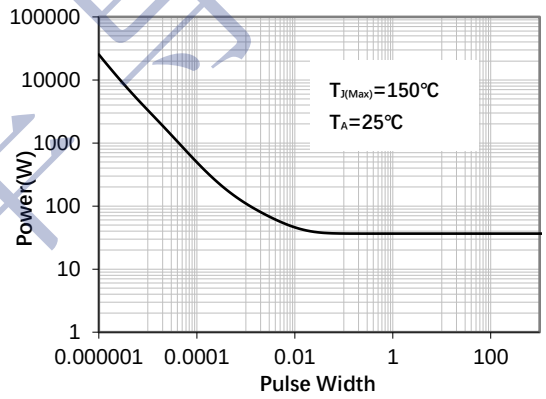
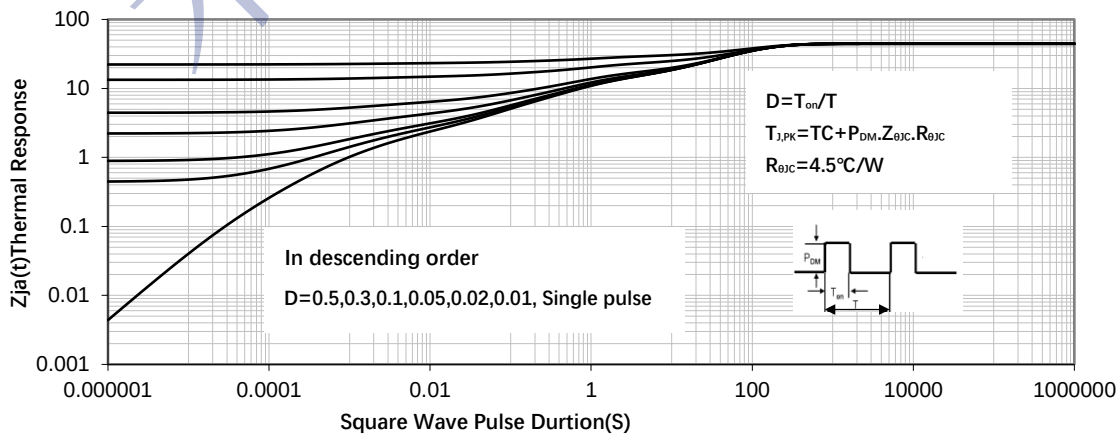
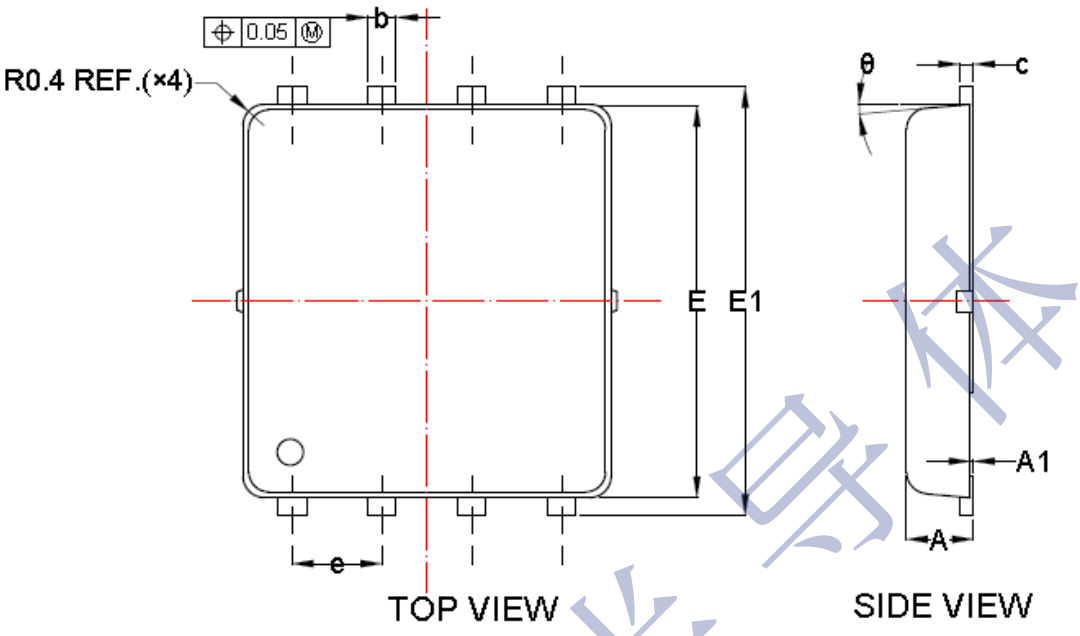


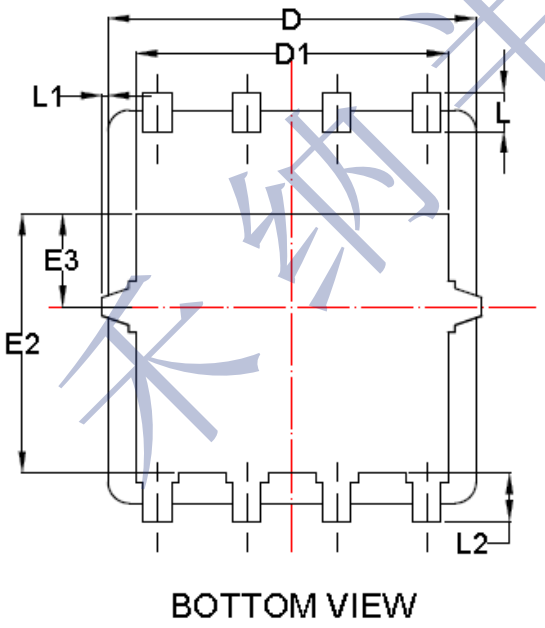
Figure 11. Normalized Maximum Transient Thermal Impedance



Physical Dimensions

PDFN5060





SYMBOLS	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.85	0.95	1.10
A1	0.00	-	0.05
b	0.30	0.40	0.50
c	0.15	0.20	0.25
D	4.80	5.10	5.40
D1	4.25	4.35	4.45
E	5.50	5.75	6.00
E1	5.95	6.05	6.25
E2	3.525	3.625	3.725
E3	1.175	1.275	1.375
e		1.27BSC	
L	0.45	0.55	0.65
L1	0.00	-	0.15
L2		0.68REF	
θ	0°	-	10°