

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D@T_c=25^{\circ}C$
650V	56mΩ@18V	72A

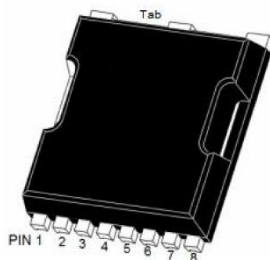
Feature

- Wide bandgap SiC MOSFET technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed switching
- Low reverse recovery(Qrr)

Application

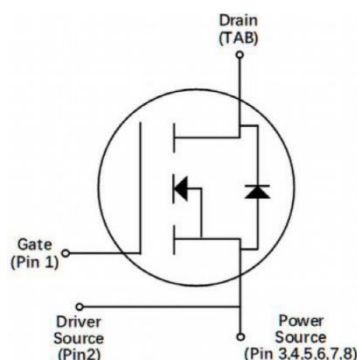
- Switch mode power supplies
- Renewable energy
- On Board Charger
- High voltage DC/DC converters

Package

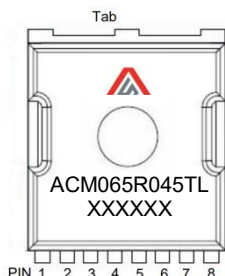


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Circuit diagram



Marking



Absolute maximum ratings (T_c=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	V _{DS}	V _{GS} = 0V, I _D = 100μA	650	V
Gate-Source Voltage	V _{GSmax}	AC (f > 1Hz)	-10/+25	V
Gate-Source Voltage	V _{GSOP}	Static	-4/+18	V
Continuous Drain Current	I _D	V _{GS} = 18V, T _C = 25°C	72	A
	I _D	V _{GS} = 18V, T _C = 100°C	51	
Pulsed Drain Current	I _{D,pulse}	Pulse with t _p limited by T _{Jmax}	121	A
Power Dissipation	P _D	T _J = 175°C	227	W
Thermal Resistance (Typ)	R _{θJC}	Junction-to-Case	0.66	°C/W
Junction Temperature	T _J		-55~ +175	°C
Storage Temperature	T _{STG}		-55~ +175	°C

Electrical characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =100μA	650			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =650V,V _{GS} =0V,T _J =25°C			50	μA
Gate-Source leakage current	I _{GSS}	V _{GS} =18V, V _{DS} =0V			250	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =12mA		2.7		V
		V _{DS} =V _{GS} , I _D =12mA,T _J =175°C		1.9		
Drain-source on-resistance	R _{DS(on)}	V _{GS} =15V, I _D =20A		44		mΩ
		V _{GS} =18V, I _D =20A		36	56	
		V _{GS} =15V, I _D =20A,T _J =175°C		52		
		V _{GS} =18V, I _D =20A,T _J =175°C		47		
Transconductance	g _{fs}	V _{GS} =18V, I _D =20A		15		S
		V _{GS} =18V, I _D =20A,T _J =175°C		14		
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =600V,V _{GS} =0V,f =1 MHz V _{AC} = 25mV		1525		pF
Output Capacitance	C _{oss}			115		
Reverse Transfer Capacitance	C _{rss}			3.3		
Internal Gate Resistance	R _{G(int)}	f=1 MHz, V _{AC} = 25mV		1.4		Ω
Total Gate Charge	Q _g	V _{DS} =400V,I _D =20A V _{GS} =-4/18V		80		nC
Gate-Source Charge	Q _{gs}			19		
Gate-Drain Charge	Q _{gd}			21		
Source-Drain Diode characteristics						
Diode Forward Current	I _S	V _{GS} =-4V,T _C =25°C		46		A
Diode Forward voltage	V _{SD}	V _{GS} =-4V, I _{SD} =10A		4.0		V
		V _{GS} =-4V, I _{SD} =10A,T _J =175°C		3.5		V
Diode pulse Current	I _{S, pulse}	V _{GS} =-4V, pulse width t _p limited by T _{imax}		121		A

Typical Characteristics

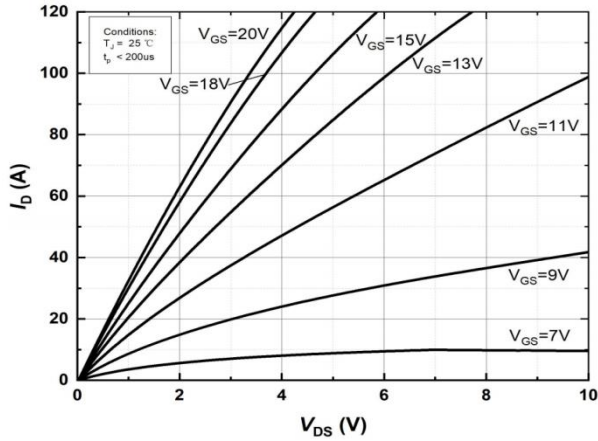


Figure 1. Output characteristics at $T_j=25^{\circ}\text{C}$

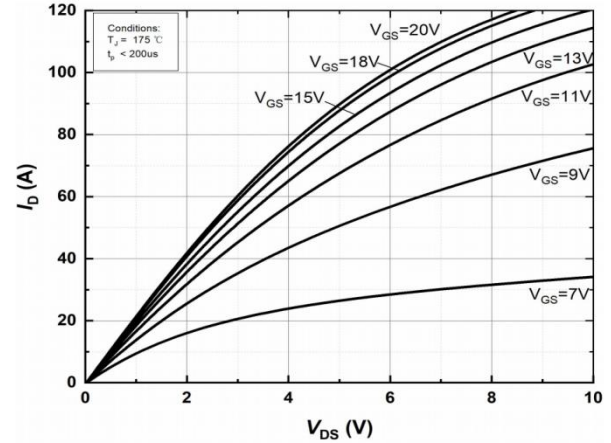


Figure 2. Output characteristics at $T_j=175^{\circ}\text{C}$

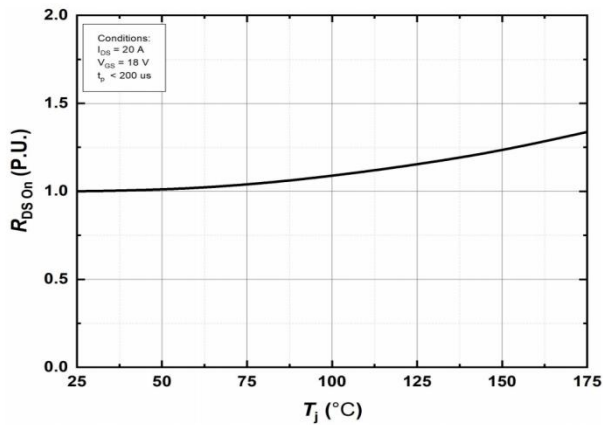


Figure 3. Normalized On-Resistance vs. Temperature

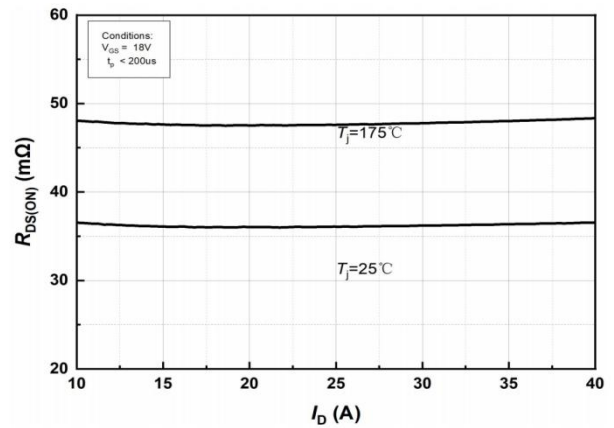


Figure 4. On-Resistance vs. Drain current for Various Temperature

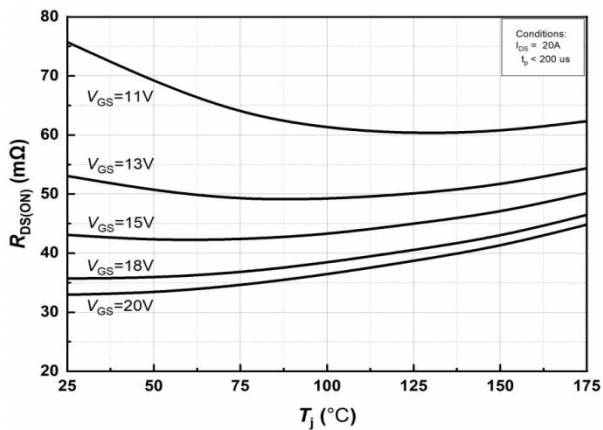


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

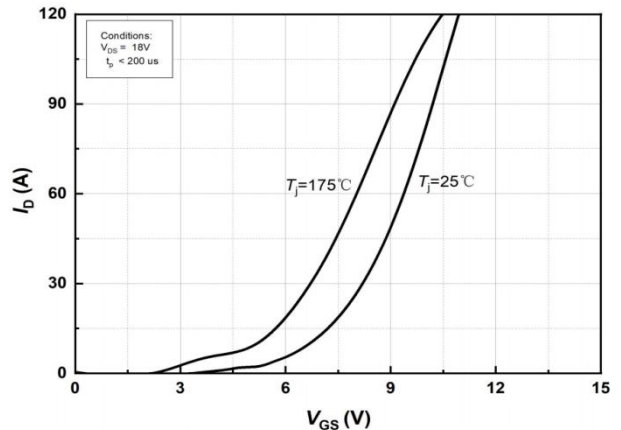


Figure 6. Transfer Characteristics for Various Junction Temperatures

Typical Characteristics

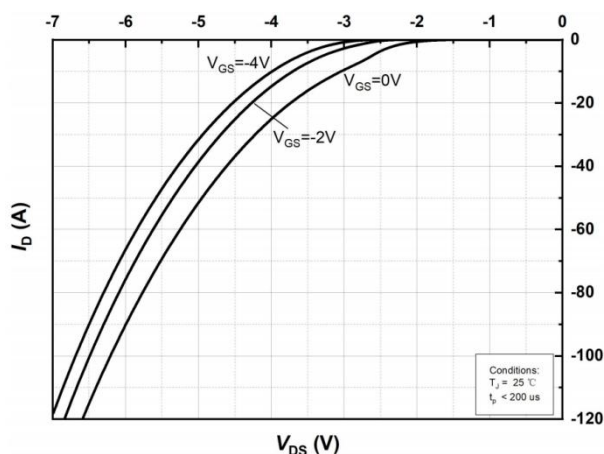


Figure 7. Body Diode Characteristics at $T_j=25^{\circ}\text{C}$

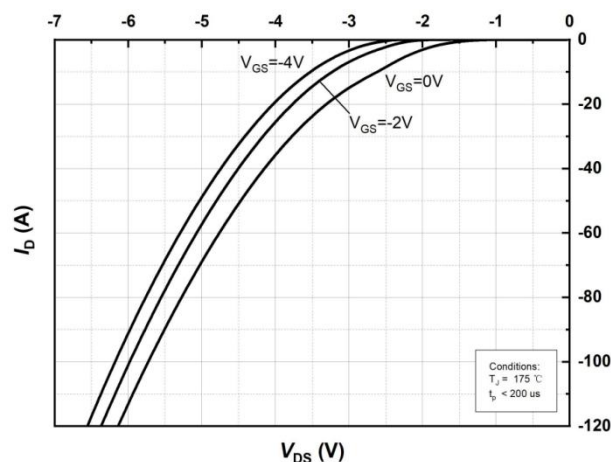


Figure 8. Body Diode Characteristics at $T_j=175^{\circ}\text{C}$

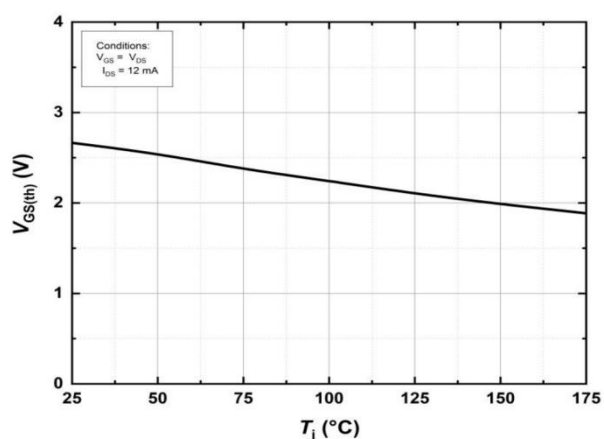


Figure 9. Threshold Voltage vs. Temperature

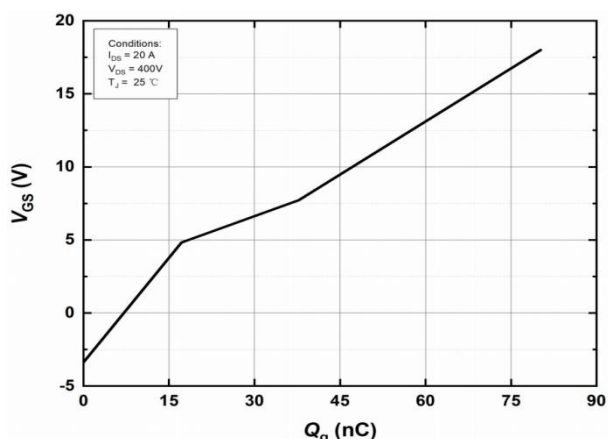


Figure 10 Gate Charge Characteristics

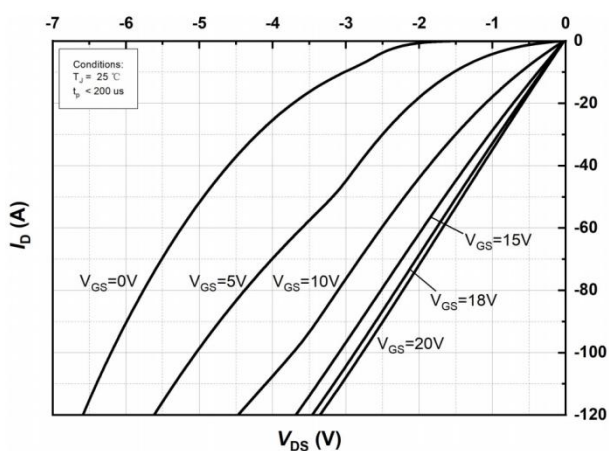


Figure 11. 3rd Quadrant Characteristic at $T_j=25^{\circ}\text{C}$

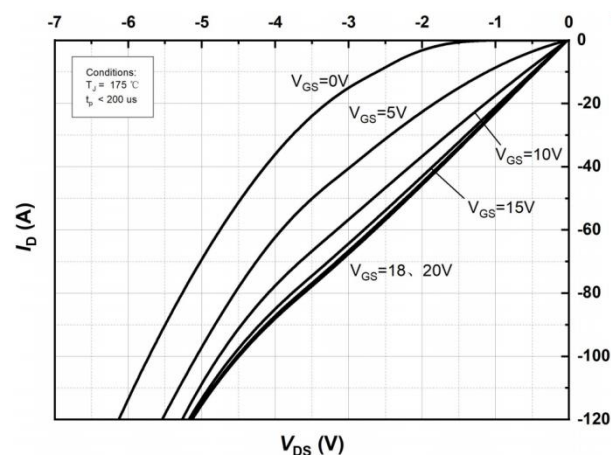


Figure 12. 3rd Quadrant Characteristic at $T_j=175^{\circ}\text{C}$

Typical Characteristics

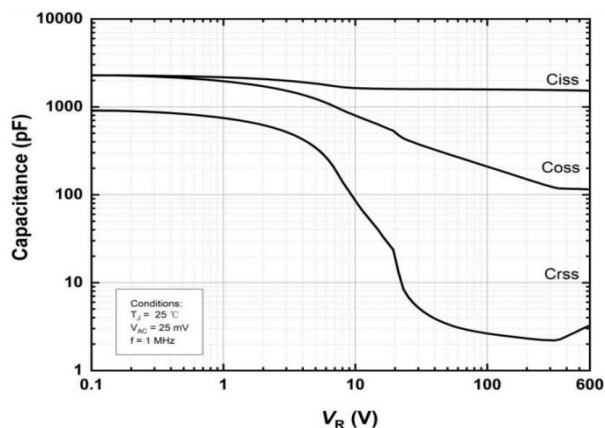


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 600V)

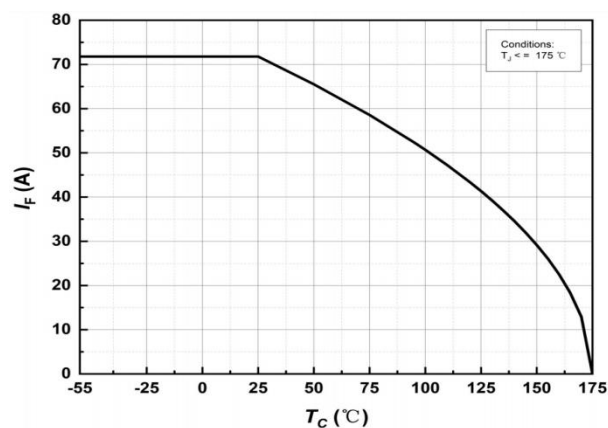


Figure 14. Continuous Drain Current Derating vs Case Temperature

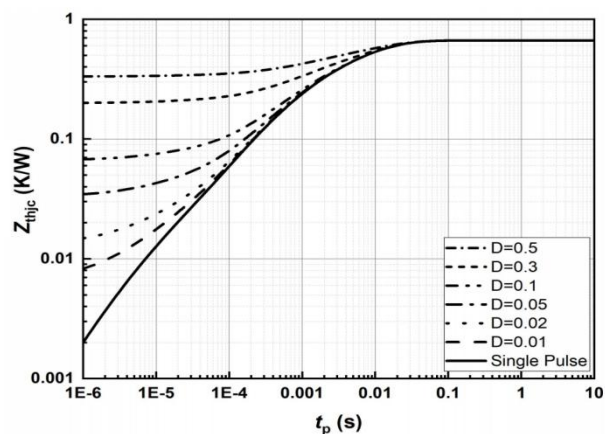


Figure 15. Transient Thermal Impedance (Junction – Case)

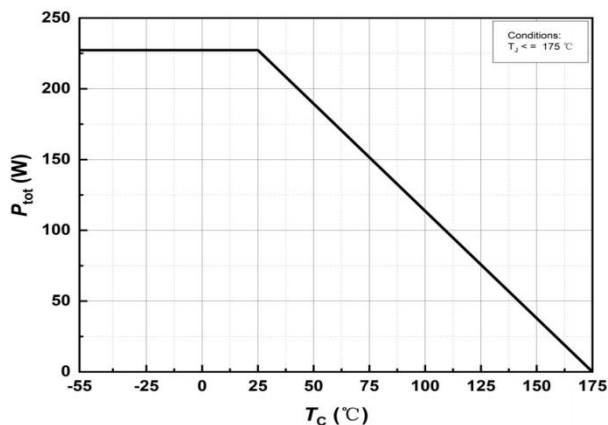


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

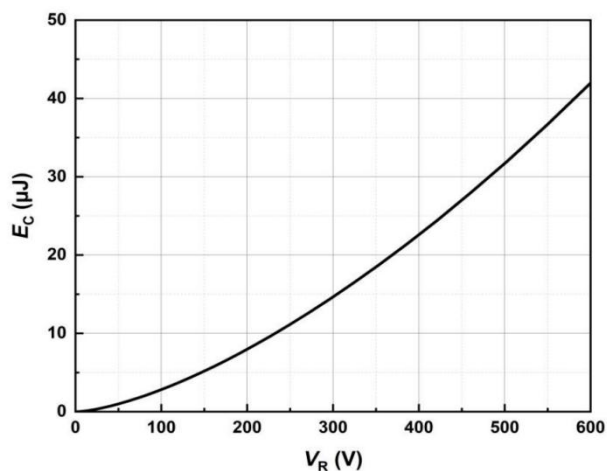


Figure 17. Output Capacitor Stored Energy

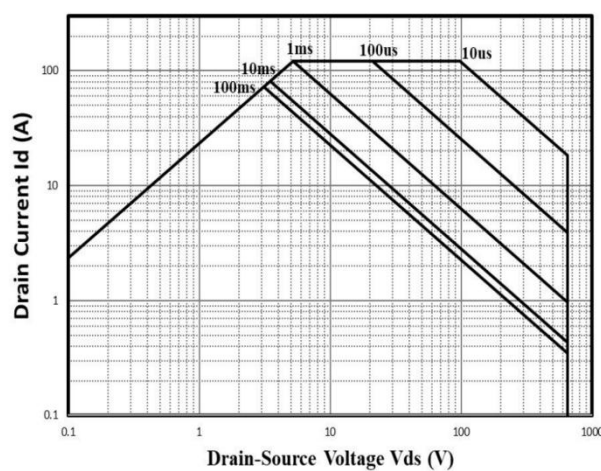
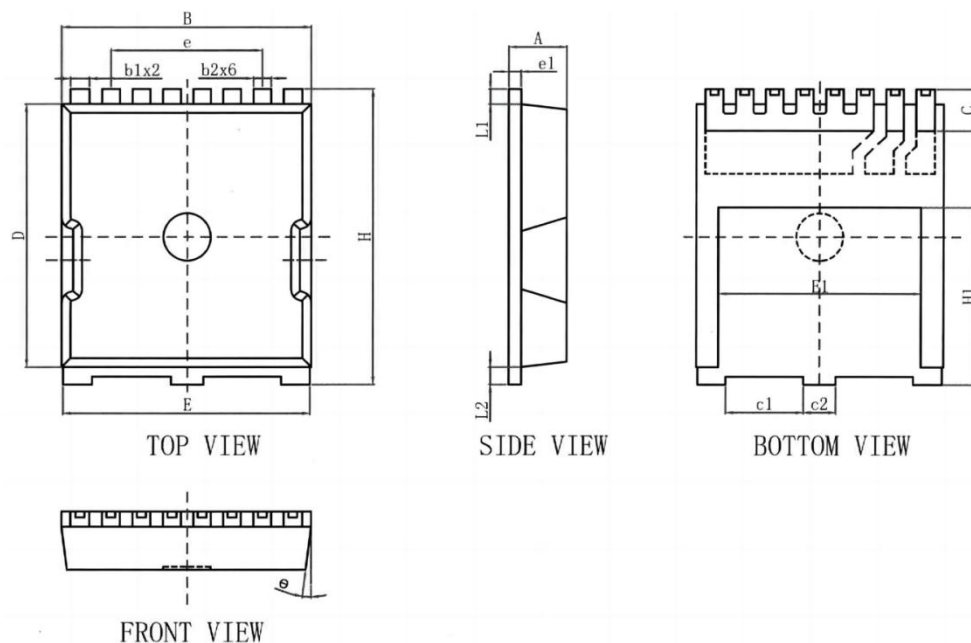


Figure 18. Safe Operating Area

TOLL Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
B	9.850	9.950	0.388	0.392
C	1.500	1.700	0.059	0.067
D	10.400	10.600	0.409	0.417
E	9.750	9.850	0.384	0.388
E1	7.950	8.250	0.313	0.325
H	11.600	11.800	0.457	0.465
H1	6.800	7.100	0.268	0.280
L1	0.550	0.750	0.022	0.030
L2	0.650	0.750	0.026	0.030
e	6.000 BSC		0.236 BSC	
e1	0.450	0.550	0.018	0.022
b1	0.700	0.800	0.028	0.031
b2	0.600	0.800	0.024	0.031
c1	3.000	3.200	0.118	0.126
c2	1.100	1.300	0.043	0.051
θ	11°		11°	