

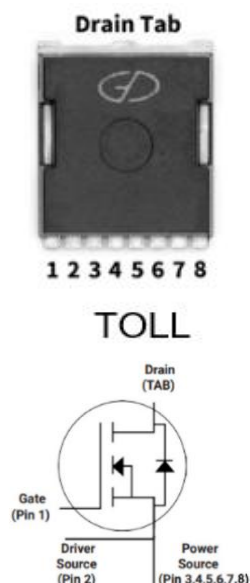
N-Channel 750V (D-S) SiC MOSFET

Features

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

Applications

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



Absolute Maximum Ratings (T_J=25°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain Source Voltage	V _{DS}	750	V
Gate Source Voltage	V _{GS}	-8/+22	V
Recommend Gate Source Voltage	V _{GSop}	-4/+18	V
Drain Current Continuous V _{GS} =18V	T _C =25°C	153	A
	T _C =125°C	89	
Power Dissipation	P _D	429	W
Operating Temperature and Storage Temperature Range	T _J /T _{STG}	-55 to +175	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction to Case	R _{thJC}	0.35	°C/W
Thermal Resistance Junction to Ambient	R _{thJA}	40	°C/W

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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =100μA	750	--	--	V
Gate Leakage Current	I _{GSS}	V _{GS} =18V, V _{DS} =0V	--	--	100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =750V, V _{GS} =0V	--	1	5	μA
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =10mA	2	2.8	4	V
		V _{DS} =V _{GS} , I _{DS} =10mA, T _J =175°C	--	2	--	
Drain-Source On-state Resistance	R _{DS(on)}	V _{GS} =18V, I _D =80A	--	11	13	mΩ
		V _{GS} =18V, I _D =80A, T _J =175°C	--	16	--	
Drain-Source On-state Resistance	R _{DS(on)}	V _{GS} =15V, I _D =80A	--	14	18	mΩ
		V _{GS} =15V, I _D =80A, T _J =175°C	--	18	--	
Total Gate Charge	Q _g	V _{GS(off)} =-4V, V _{GS(on)} =18V V _{DD} =600V, I _D =80 A	--	157	--	nC
Gate Source Charge	Q _{gs}		--	21.6	--	
Gate Drain Charge	Q _{gd}		--	25.6	--	
Turn-On Switching Energy	E _{ON}	V _{GS} =-4/+18V, V _{DD} =600V · I _D =80A, R _G =5Ω, L=1mH	--	545	--	mJ
Turn-Off Switching Energy	E _{OFF}		--	539.7	--	
Turn-on Delay Time	t _{d(on)}		--	21	--	ns
Turn-on Rise Time	t _r		--	15.6	--	
Turn-off Delay Time	t _{d(off)}		--	60.2	--	
Turn-off Fall Time	t _f		--	22	--	
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =1000V, V _{AC} =25mV, f=1MHz	--	4878	--	pF
Output Capacitance	C _{oss}		--	303	--	
Reverse Transfer Capacitance	C _{rss}		--	19.6	--	
Gate resistance	R _G	V _{AC} = 25mV, f=1MHz	--	2.2	--	Ω

Reverse Diode Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{SD}	$I_{SD}=40\text{A}$, $V_{GS}=-4\text{V}$	--	4.2	--	V
		$I_{SD}=40\text{A}$, $V_{GS}=-4\text{V}$, $T_J=175^{\circ}\text{C}$	--	3.8	--	
Continuous Diode Forward Current	I_{SD}	$V_{GS}=-4\text{V}$	--	153	--	A
Reverse Recovery Time	t_{rr}	$V_R=800\text{V}$, $I_F=80\text{A}$, $V_{GS}=-4\text{V}$, $di/dt=1000\text{A}/\mu\text{s}$	--	28.6	--	ns
Reverse Recovery Charge	Q_{rr}		--	260	--	nC
Reverse Recovery Energy	E_{REC}		--	20	--	uJ
Peak Reverse Recovery Current	I_{rrm}		--	16	--	A
Charge Time	t_A		--	18.4	--	ns
DisCharge Time	t_B		--	10.6	--	ns

Typical Characteristics Curves ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Figure 1. Output Characteristic ($T_J = -55^\circ\text{C}$)

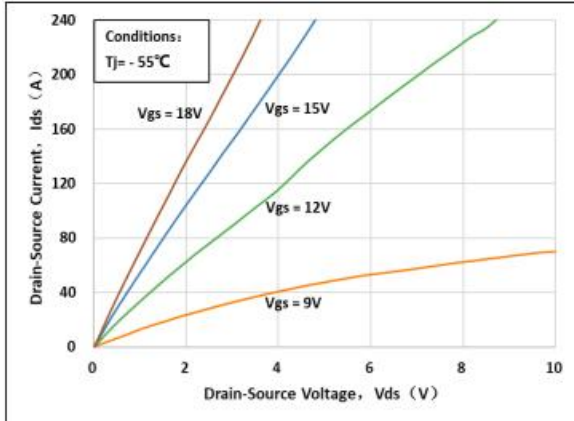


Figure 2. Output Characteristic ($T_J = 25^\circ\text{C}$)

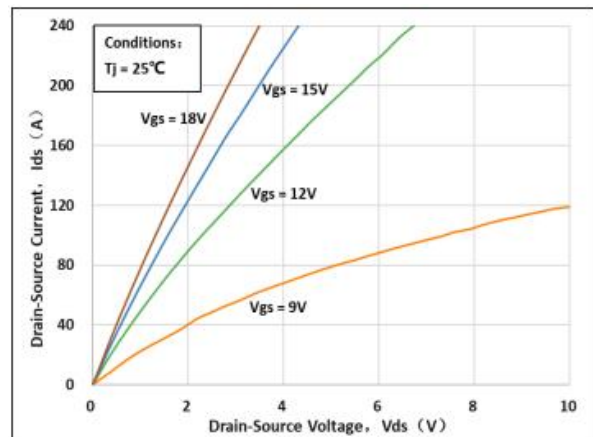


Figure 3. Output Characteristic ($T_J = 175^\circ\text{C}$)

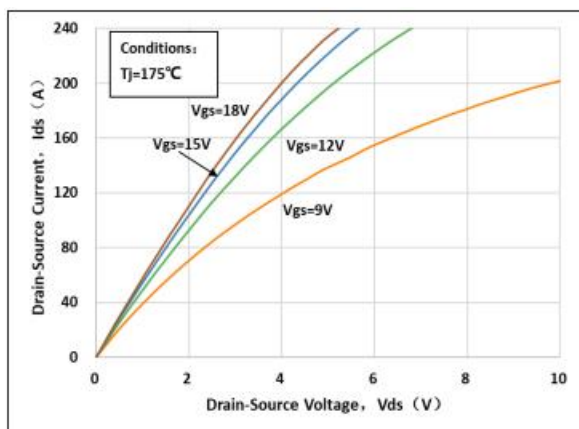


Figure 4. $R_{DS(on)}$ Vs I_{DS} Characteristic

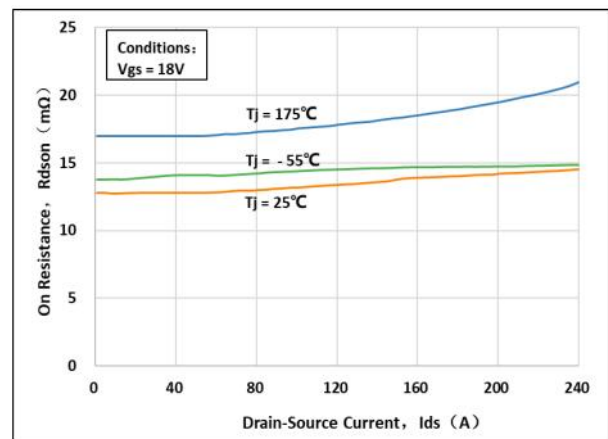


Figure 5. $R_{DS(on)}$ vs. Temperature

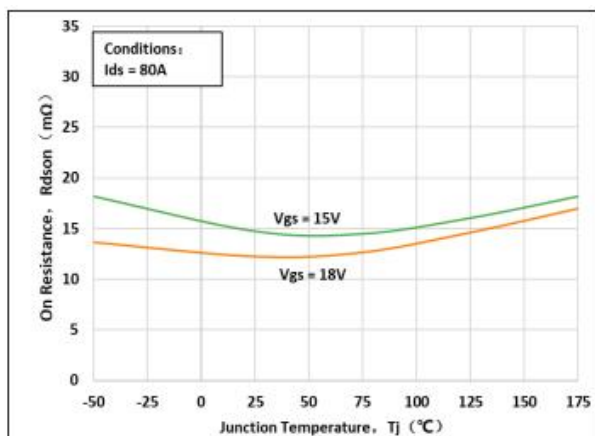
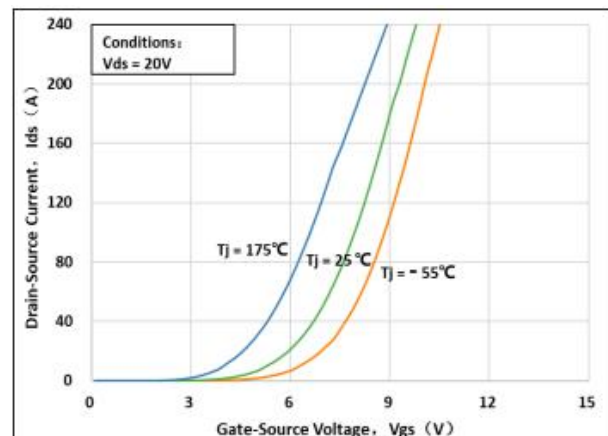


Figure 6. Transfer Characteristic



Typical Characteristics Curves ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Figure 7: Body-diode Characteristic ($T_J = -55^\circ\text{C}$)

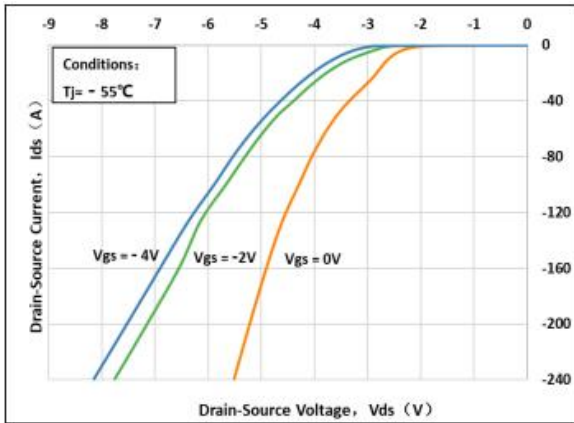


Figure 8: Body-diode Characteristic ($T_J = 25^\circ\text{C}$)

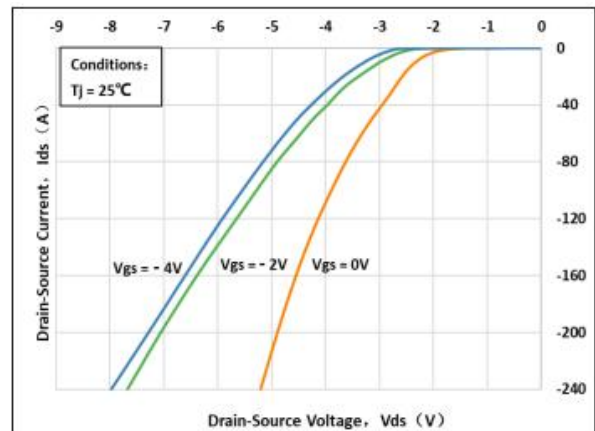


Figure 9: Body-diode Characteristic ($T_J = 175^\circ\text{C}$)

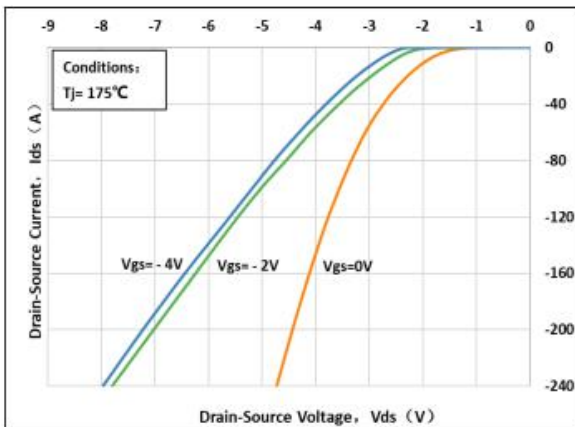


Figure 10: V_{TH} Vs T_J Temperature Characteristic

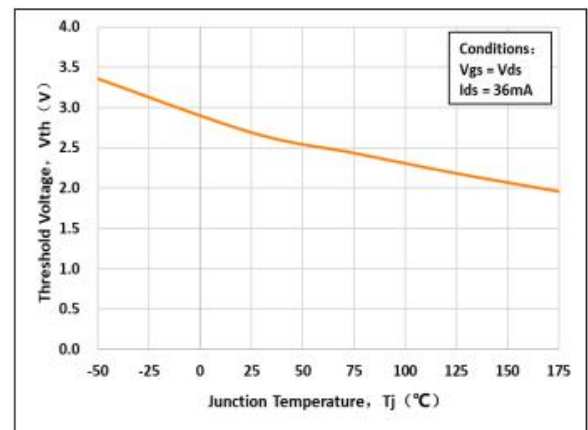


Figure 11: 3rd Quadrant Characteristic ($T_J = -55^\circ\text{C}$)

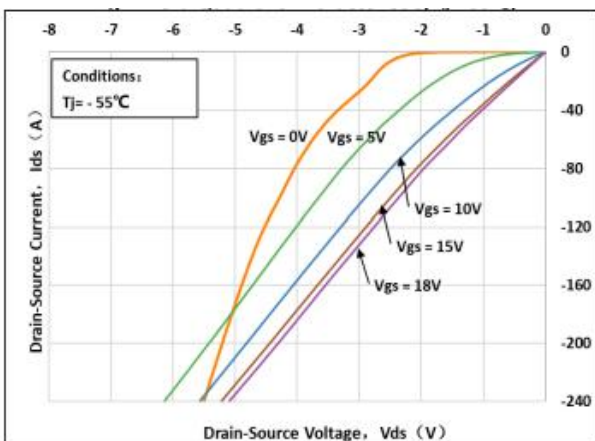
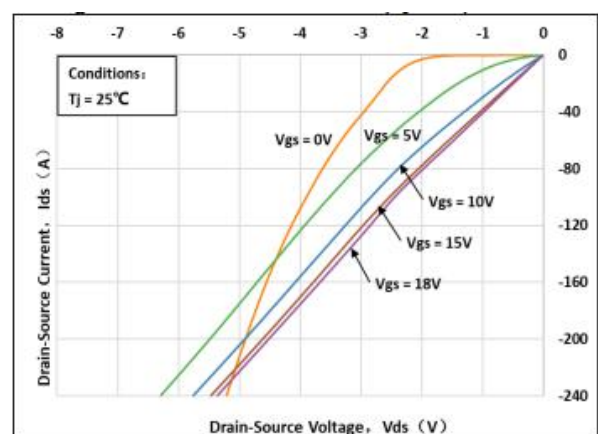


Figure 12: 3rd Quadrant Characteristic ($T_J = 25^\circ\text{C}$)



Typical Characteristics Curves ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Figure 13: 3rd Quadrant Characteristic($T_J=175^\circ\text{C}$)

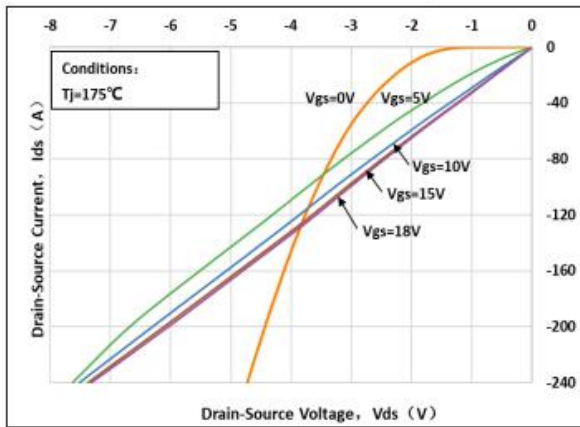


Figure 14: Gate Charge Characteristics

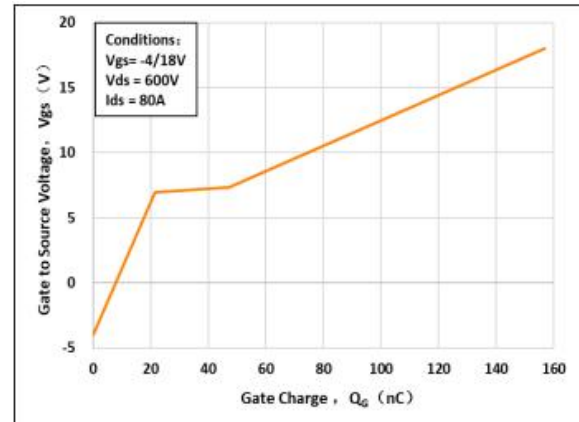


Figure 15: Drain Current vs. Case Temperature

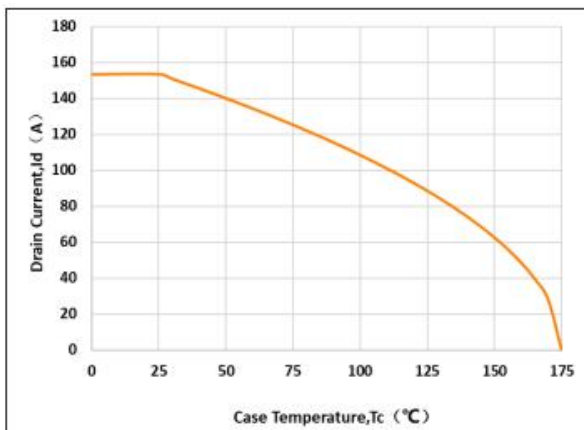


Figure 16: Safe Operating Area

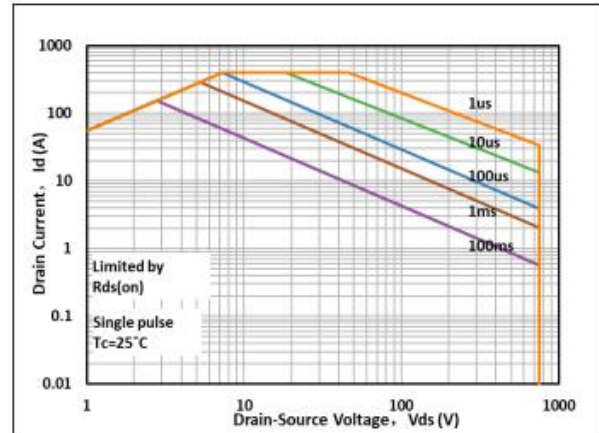


Figure 17: Capacitance Characteristics

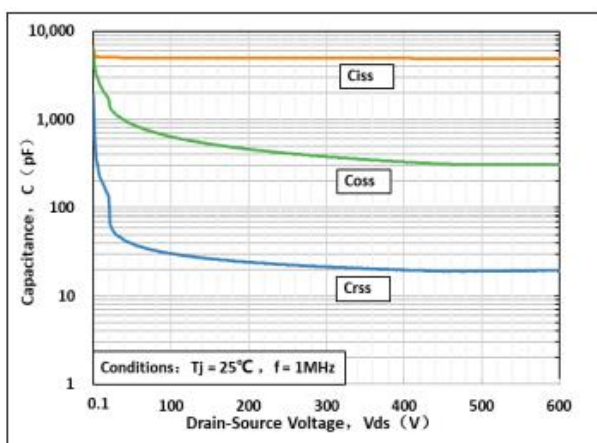
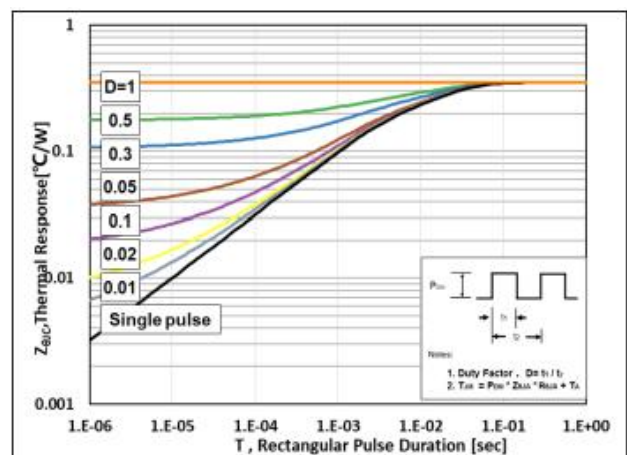
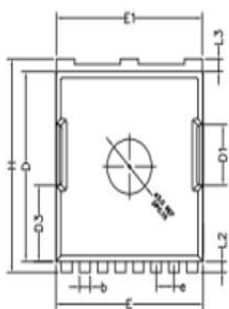


Figure 18: Transient Thermal Impedance



Package Outline Dimensions (Unit: millimeters)

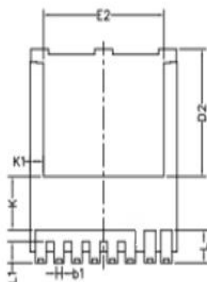
TOLL



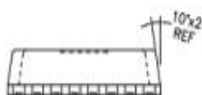
TOP VIEW



SIDE VIEW



BOTTEM VIEW



SIDE VIEW

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	2.200	2.300	2.400
b	0.600	0.700	0.900
b1	0.300	—	0.500
c	0.400	0.500	0.600
D	10.280	10.380	10.480
D1	3.200	3.300	3.400
D2	6.850	6.950	7.050
D3	4.18REF		
E	9.800	9.900	10.000
E1	9.700	9.800	9.900
E2	8.000	8.100	8.200
e	1.200BSC		
H	11.480	11.680	11.880
L	1.600	1.800	2.100
L1	1.000	1.150	1.300
L2	0.600 TYPE		
L3	0.600 TYPE		
K	2.900 TYPE		
K1	0.900 TYPE		

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