

Silicon Carbide MOSFET

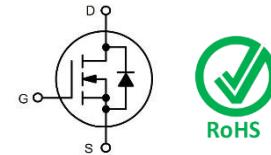
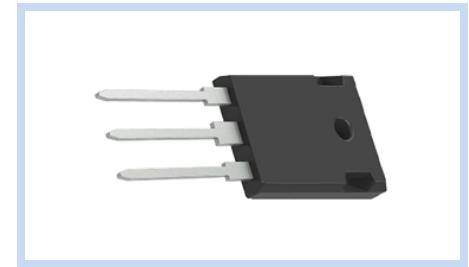
N-Channel 1200V 69A TO-247

MFTC120N69T247

MERITEK

FEATURE

- $R_{DS(ON)} < 48m\Omega$ at $V_{GS}=18V$, $I_D=40A$
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed Switching
- Low Reverse Recovery
- Applications: High Voltage DC/DC Converters, Switching Mode Power Supplier, Renewable Energy, Motor Drives



MECHANICAL DATA

- Case: TO-247 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

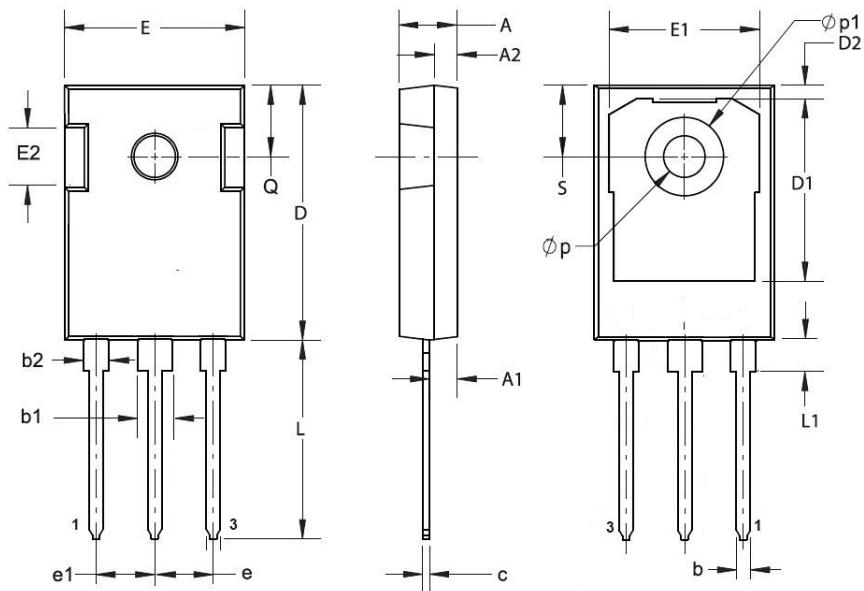
MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GS}	-10/+25	V
Static		-4/+18	
Drain Current – Continuous	I_D	69	A
$V_{GS}=18V$, $T_c=25^\circ C$		49	
Drain Current – Pulse with t_p Limited by T_{jmax}	I_{DM}	140	A
at 1ms		331	
Power Dissipation	P_D	348	W
Thermal Resistance, Junction to Case		0.43	
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	°C

DIMENSIONS

DIMENSION	Min	Max
A	4.80	5.20
A1	2.21	2.59
A2	1.85	2.15
b	1.11	1.36
b1	2.91	3.21
b2	1.91	2.21
c	0.51	0.75
D	20.70	21.30
D1	16.25	16.85
e	5.44 BSC	
e1	5.44 BSC	
E	15.50	16.10
L	19.62	20.22
L1	--	4.30
p	3.40	3.80
p1	--	7.30
Q	6.15 BSC	

Note: Pin Layout: 1:Gate(G), 2:Drain(D), 3:Source(S)



ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=100\mu A$	BV_{DSS}	1200	--	--	V
Zero Gate Voltage Drain Current	$V_{DS}=1200V, V_{GS}=0V$	I_{DSS}	--	1	50	μA
Gate-Body Leakage Current	$V_{GS}=18V, V_{DS}=0V$	I_{GSS}	--	--	250	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=18V, I_D=40A$	$R_{DS(ON)}$	--	32	48	$m\Omega$
	$V_{GS}=20V, I_D=40A$		--	30	--	
	$V_{GS}=18V, I_D=40A, T_J=175^\circ C$		--	58	--	
	$V_{GS}=20V, I_D=40A, T_J=175^\circ C$		--	52	--	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=11.5mA$	$V_{GS(th)}$	--	2.9	--	V
	$V_{GS}=V_{DS}, I_D=11.5mA, T_J=175^\circ C$		--	2.0	--	
Transconductance	$V_{GS}=18V, I_D=40A$	g_{FS}	--	26	--	S
	$V_{GS}=18V, I_D=40A, T_J=175^\circ C$		--	22	--	
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=800V, I_D=40A, V_{GS}=-4/+18V$	Q_g	--	88.1	--	nC
Gate-Source Charge		Q_{gs}	--	35	--	
Gate-Drain Charge		Q_{gd}	--	31.7	--	
Turn-On Delay Time	$V_{DS}=800V, I_D=40A, L=276\mu H$ $V_{GS}=-4/+18V, R_{GEN}=5\Omega$	$T_{d(on)}$	--	5	--	nS
Rise Time		T_r	--	33.6	--	
Turn-Off Delay Time		$T_{d(off)}$	--	27.8	--	
Fall Time		T_f	--	13	--	
Turn-On Switching Loss		E_{ON}	--	578	--	μJ
Turn-Off Switching Loss		E_{OFF}	--	294	--	
Total Switching Loss		E_{TOT}	--	872	--	
Input Capacitance	$V_{DS}=1000V, V_{GS}=0V, V_{AC}=25mV$ $f=1MHz$	C_{iss}	--	2812	--	pF
Output Capacitance		C_{oss}	--	111	--	
Reverse Transfer Capacitance		C_{rss}	--	7	--	
Internal Gate Resistance	$V_{AC}=25mV, f=1MHz$	$R_{G(int)}$	--	1	--	Ω
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	$V_{GS}=-4V, T_C=25^\circ C$	I_s	--	72	--	A
Diode Forward Current - Pulse with tp Limited by T_{Jmax}	$V_{GS}=-4V$	$I_{s,Pulse}$	--	140	--	A
Drain-Source Diode Forward Voltage	$V_{GS}=-4V, I_{SD}=20A$	V_{SD}	--	3.9	--	V
	$V_{GS}=-4V, I_{SD}=20A, T_J=175^\circ C$		--	3.3	--	
Peak Reverse Recovery Current	$V_{GS}=-4V, V_R=800V, I_{SD}=40A, dif/dt=3800A/\mu s$	I_{rm}	--	18	--	A
Reverse Recovery Time		T_{rr}	--	31	--	nS
Reverse Recovery Charge		Q_{rr}	--	281	--	nC

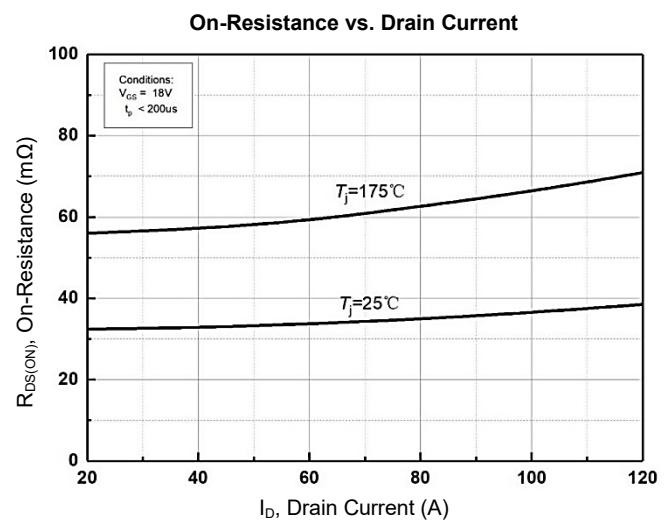
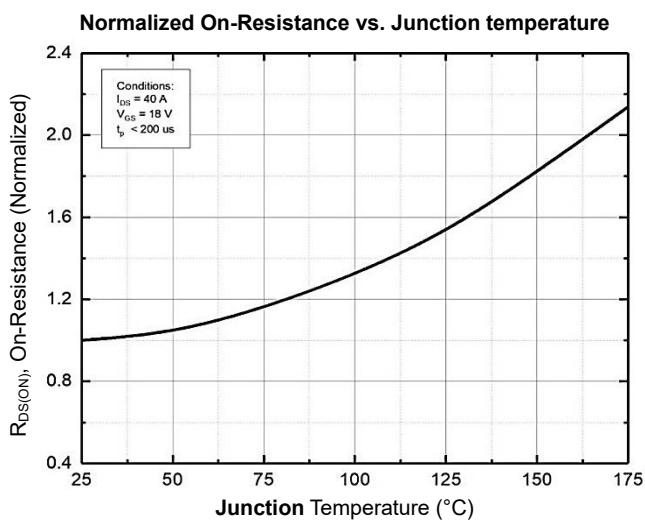
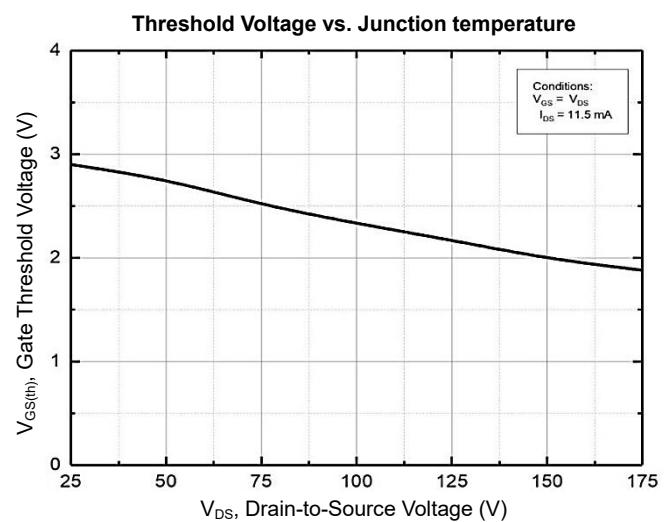
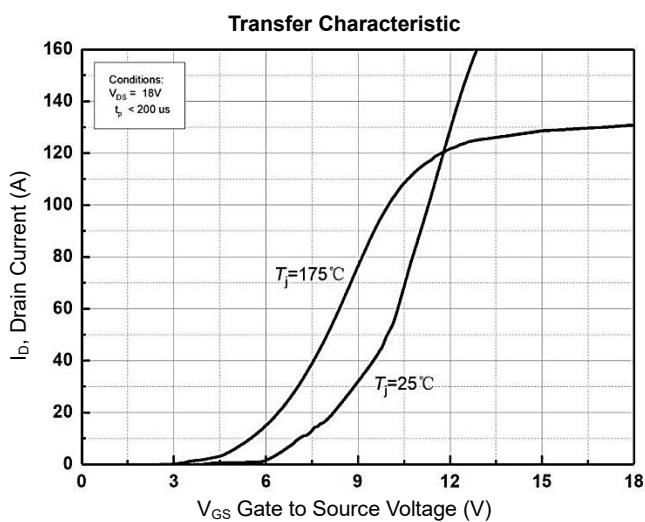
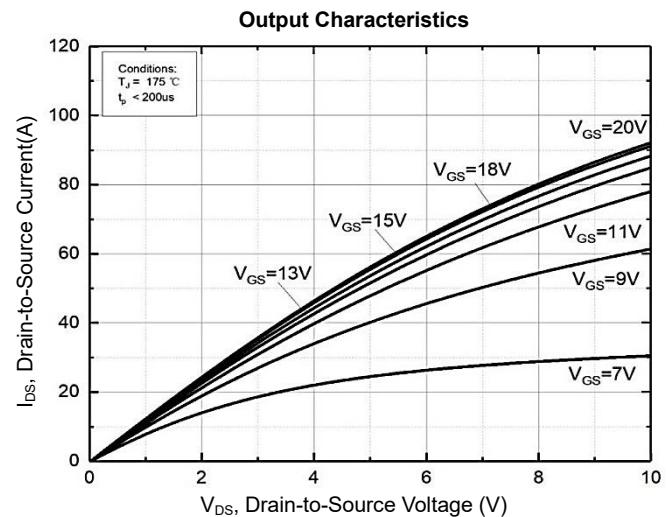
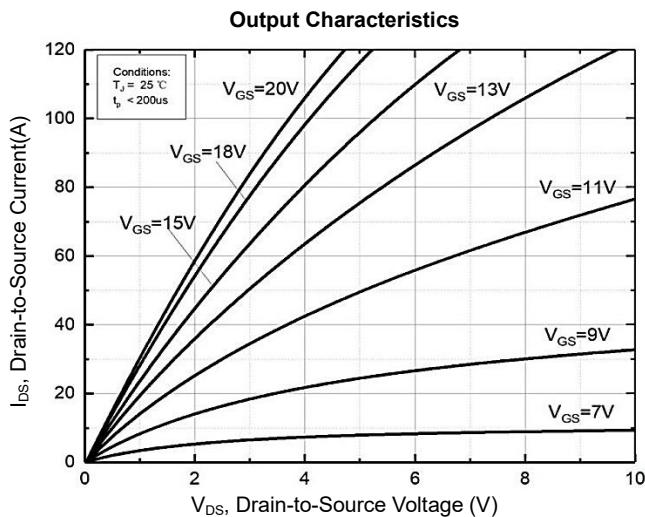
Silicon Carbide MOSFET

N-Channel 1200V 69A TO-247

MFTC120N69T247

MERITEK

CHARACTERISTIC CURVES



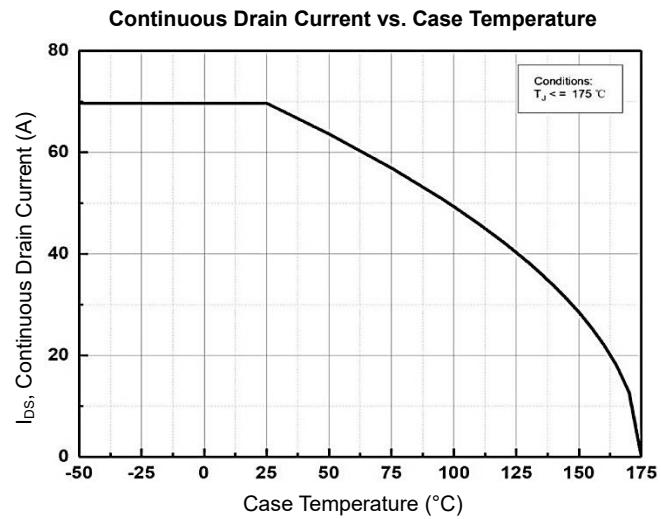
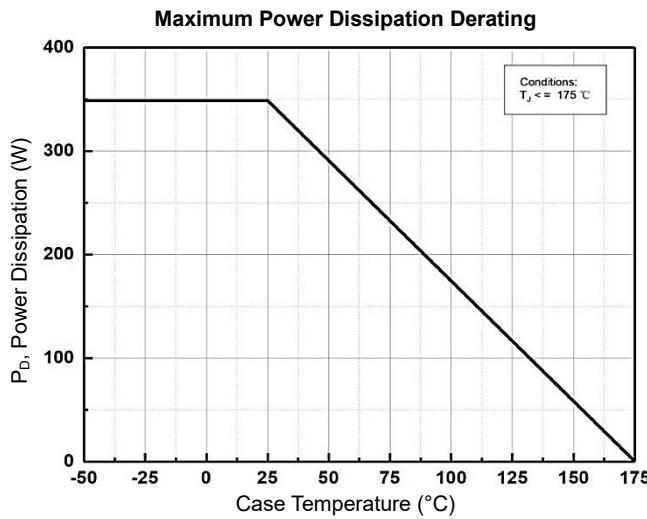
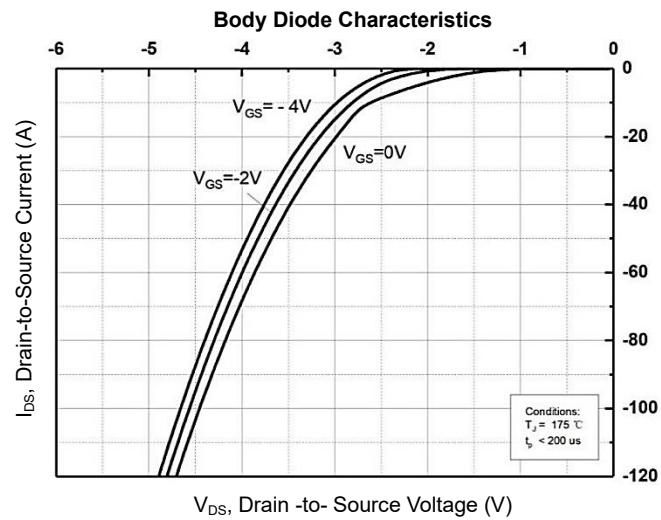
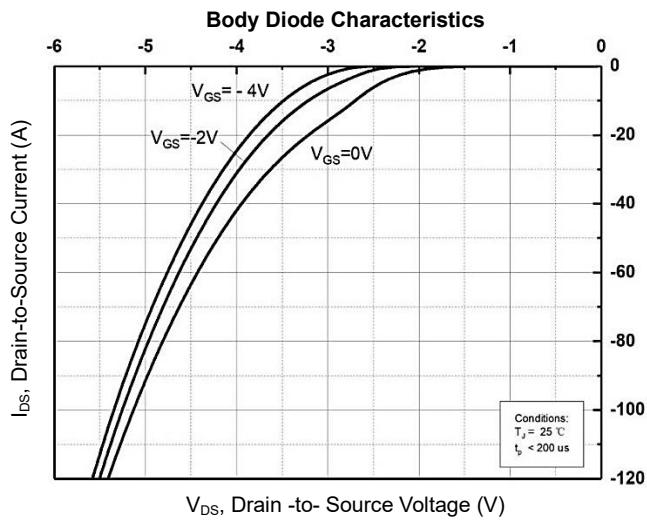
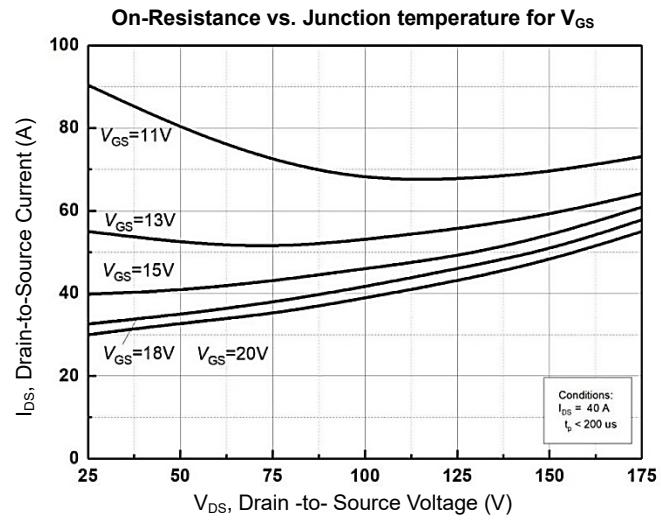
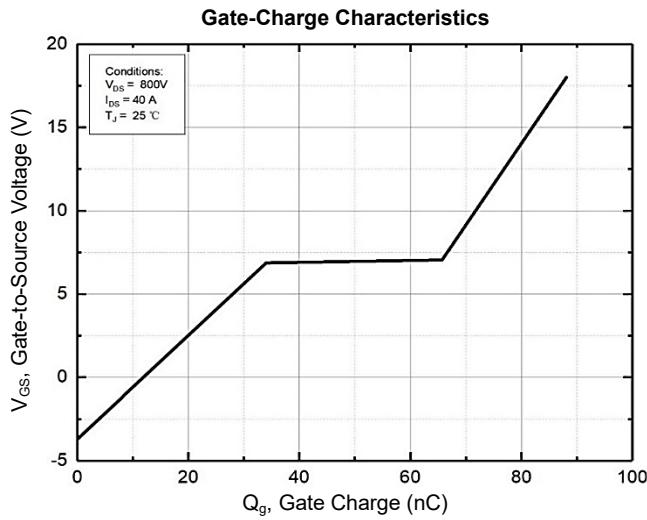
Silicon Carbide MOSFET

N-Channel 1200V 69A TO-247

MFTC120N69T247

MERITEK

CHARACTERISTIC CURVES



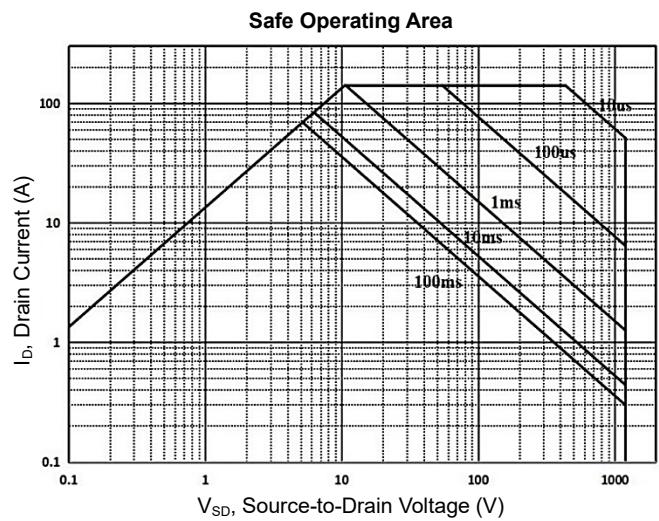
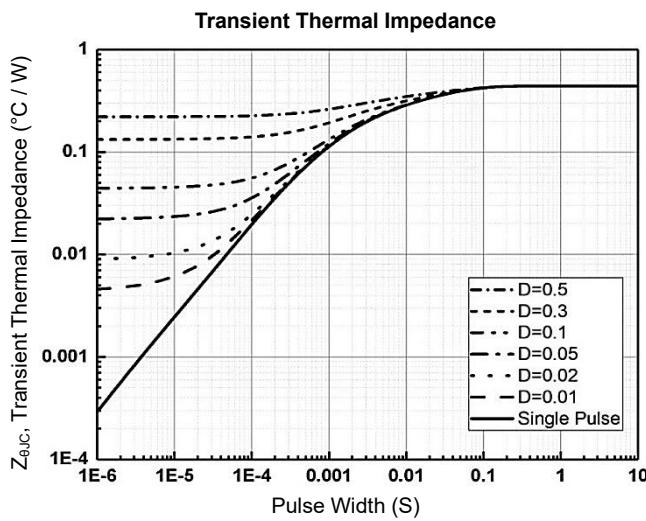
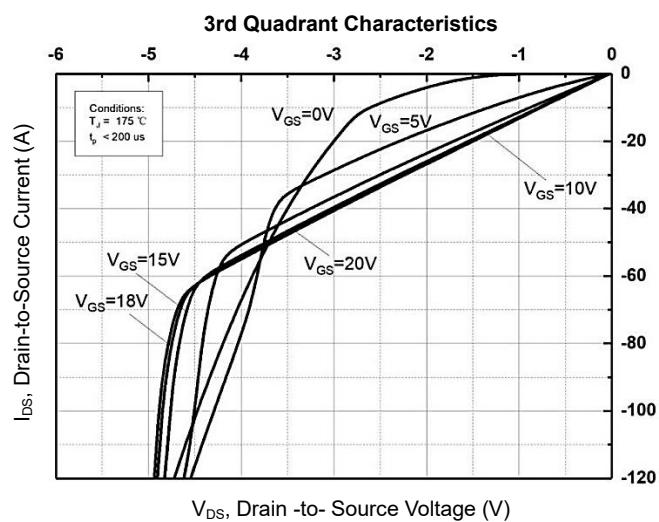
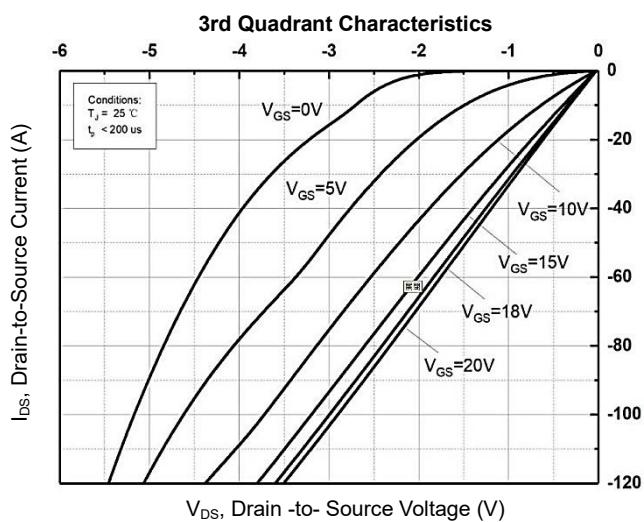
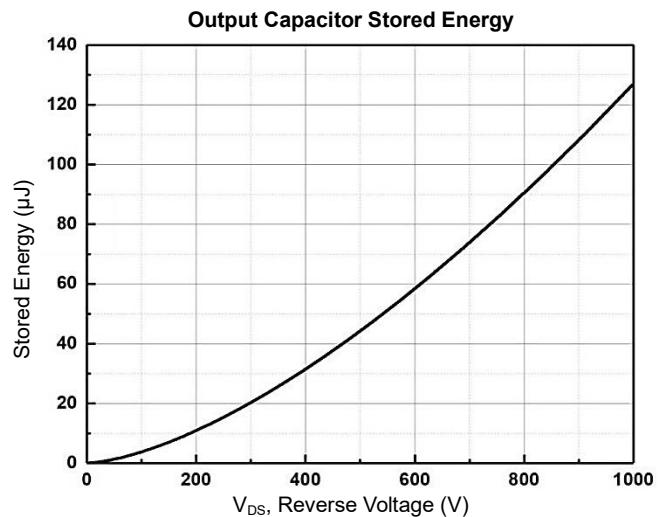
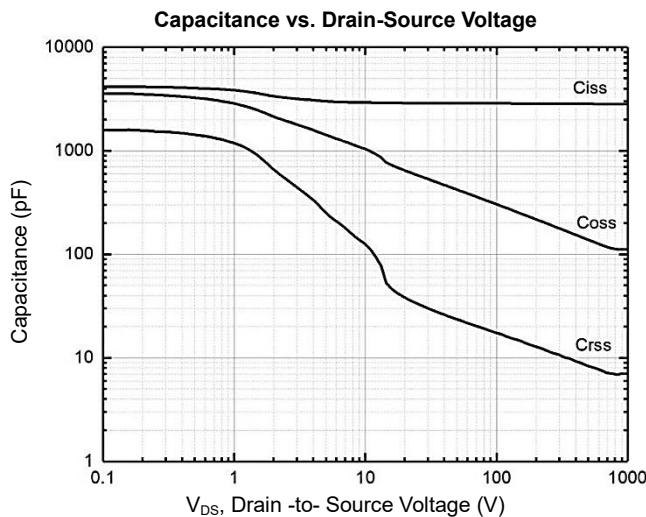
Silicon Carbide MOSFET

N-Channel 1200V 69A TO-247

MFTC120N69T247

MERITEK

CHARACTERISTIC CURVES



CHARACTERISTIC CURVES

