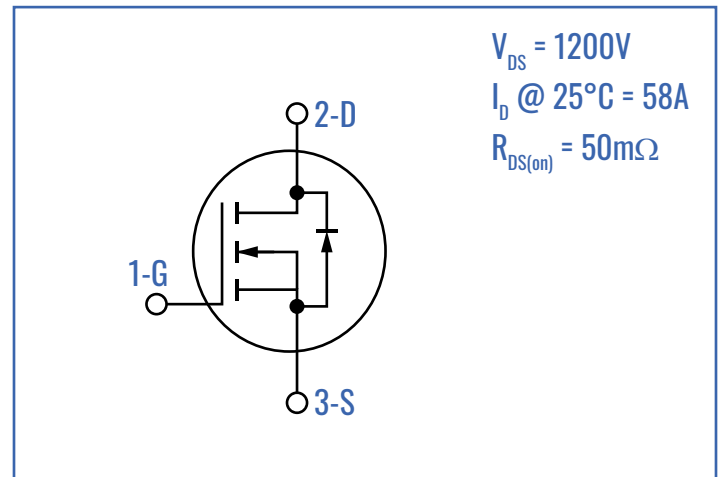


KEY FEATURES

- $I_D = 58A$
- $R_{DS(on)} = 50m\Omega$
- TO-247-3 PLASTIC PACKAGE

BENEFITS

- HIGH BLOCKING VOLTAGE WITH LOW ON-RESISTANCE
- HIGH SPEED SWITCHING WITH LOW CAPACITANCE
- HIGH OPERATING JUNCTION TEMPERATURE CAPABILITY
- VERY FAST AND ROBUST INTRINSIC BODY DIODE



APPLICATIONS

- SOLAR INVERTERS
- UPS
- MOTOR DRIVERS
- HIGH VOLTAGE DC/DC CONVERTERS
- SWITCH MODE POWER SUPPLIES

ORDERING GUIDE

Part Number	SD11720
Description	1200V SiC N-Channel Power MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_c = 25^\circ C$)

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE	UNIT
$V_{DS,max}$	Drain-Source Voltage	$V_{GS} = 0V, I_D = 100\mu A$	1200	V
$V_{GS,max}$	Gate-Source Voltage	Absolute maximum values	-5/+20	V
I_D	Continuous Drain Current (see fig. 21)	$V_{GS} = 20V, T_c = 25^\circ C$ $V_{GS} = 20V, T_c = 100^\circ C$	58 43	A A
$I_{D,pulse}$	Pulsed Drain Current (see fig. 24)	Pulse Width Limited by SOA	15	A
P_D	Maximum Power Dissipation (see fig. 22)	$T_c = 25^\circ C$	327	W
T_J, T_{STG}	Junction Temperature, Operating and Storage		-55 to +175	$^\circ C$
T_L	Solder Temperature	Wave soldering only allowed at leads, 1.6mm from case for 10s	260	$^\circ C$

THERMAL DATA

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE	UNIT
$R_{\theta(J-C)}$	Thermal Resistance from Junction to Case	see fig. 23	0.459	$^\circ C/W$

ELECTRICAL CHARACTERISTICS (T_c = 25°C)

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 1200V, V _{GS} = 0V		5	100	μA
I _{GSS}	Gate Leakage Current	V _{DS} = 0V, V _{GS} = -5 to 20V		1	±100	nA
V _{TH}	Gate Threshold Voltage (see figs. 8 & 9)	V _{GS} = V _{DS} , I _D = 6mA, T _c = 25°C		3.2		V
		V _{GS} = V _{DS} , I _D = 6mA, T _c = 175°C		2.2		
R _{ON}	Static Drain-Source ON Resistance (see figs. 4, 5, 6 & 7)	V _{GS} = 20V, I _D = 20A, T _c = 25°C		50	65	mΩ
		V _{GS} = 20V, I _D = 20A, T _c = 175°C		80		
C _{iss}	Input Capacitance (see fig. 16)	V _{DS} = 800V, V _{GS} = 0V, f = 1MHz, V _{AC} = 25mV		2700		pF
C _{oss}	Output Capacitance (see fig. 16)			110		
C _{rss}	Reverse Transfer Capacitance (see fig. 16)			10		
E _{oss}	C _{oss} Stored Energy (see fig. 17)			45		
Q _g	Total Gate Charge (see fig. 18)	V _{DS} = 800V, I _D = 20A, V _{GS} = 5 to 20V		120		nC
Q _{gs}	Gate-Source Charge (see fig. 18)			25		
Q _{gd}	Gate-Drain Charge (see fig. 18)			48		
R _g	Gate Input Resistance	f = 1MHz		2.8		Ω
E _{ON}	Turn-On Switching Energy (see figs. 19 & 20)	V _{DS} = 800V, I _D = 30A, V _{GS} = 2 to 20V, R _{G(ext)} = 3.3Ω, L = 450μH		877		μJ
E _{OFF}	Turn-Off Switching Energy (see figs. 19 & 20)			211		
t _{d(on)}	Turn-On Delay Time (see figs. 19 & 20)			31		ns
t _r	Rise Time (see figs. 19 & 20)			22		
t _{d(off)}	Turn-Off Delay Time (see figs. 19 & 20)			22		
t _f	Fall Time (see figs. 19 & 20)			19		

REVERSE DIODE CHARACTERISTICS (T_c = 25°C)

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
V _{SD}	Diode Forward Voltage (see figs. 10, 11 & 12)	V _{GS} = 0V, I _{SD} = 20A, T _j = +25°C		4.9		V
		V _{GS} = 0V, I _{SD} = 20A, T _j = +175°C		4.4		V
t _{rr}	Reverse Recovery Time	V _{GS} = -2/+20V, I _{SD} = 30A, V _R = 800A, di/dt = 1000A/μS, R _{G(ext)} = 10Ω, L = 450μH		44.4		ns
Q _{rr}	Reverse Recovery Charge			212.6		nC
I _{RRM}	Peak Reverse Recovery Current				10.8	

CHARACTERISTICS

Fig 1: Output Characteristics $T_j = -55^\circ\text{C}$

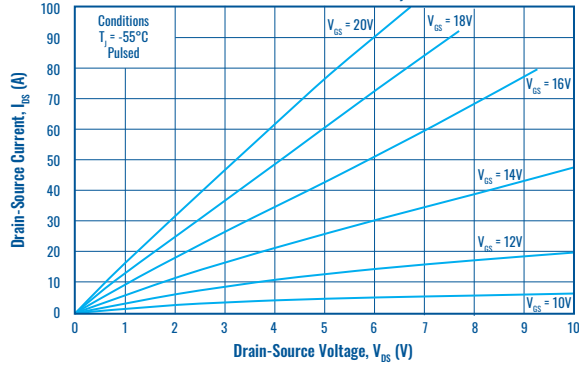


Fig 2: Output Characteristics $T_j = 25^\circ\text{C}$

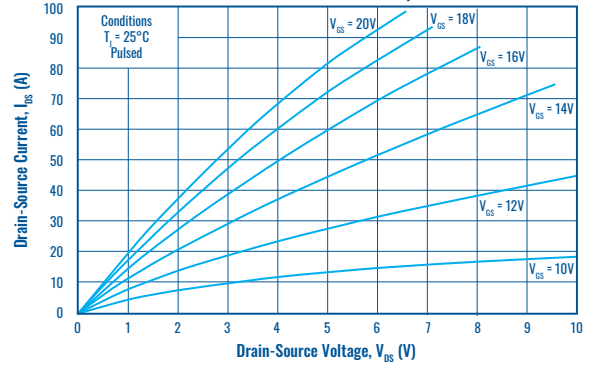


Fig 3: Output Characteristics $T_j = 175^\circ\text{C}$

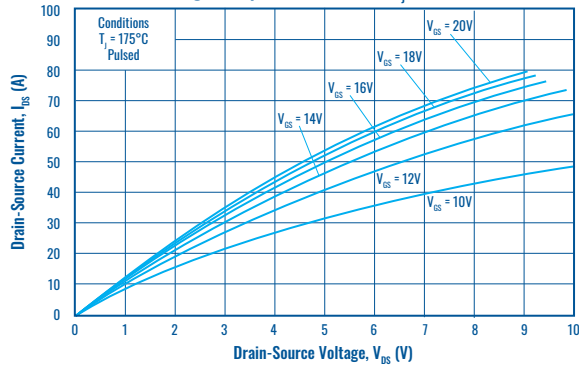


Fig 4: On-Resistance vs. Junction Temperature

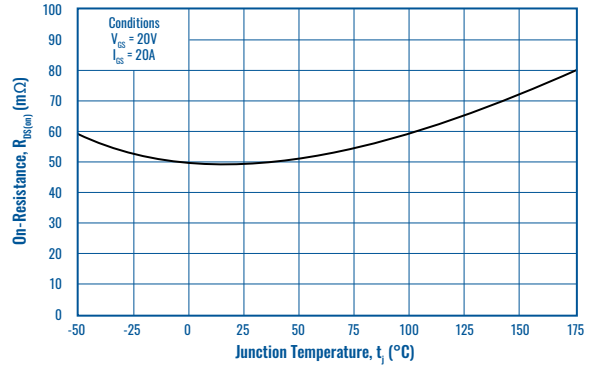


Fig 5: Normalized On-Resistance vs. Junction Temperature

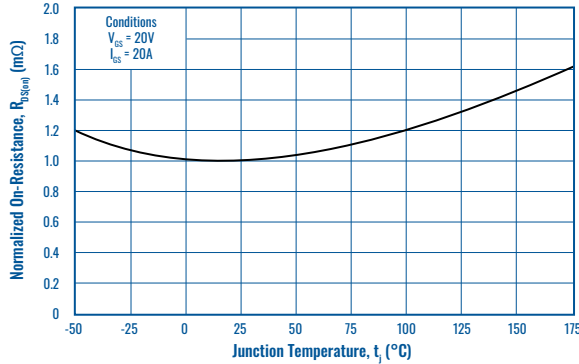


Fig 6: On-Resistance vs. Drain Current vs. Junction Temperature

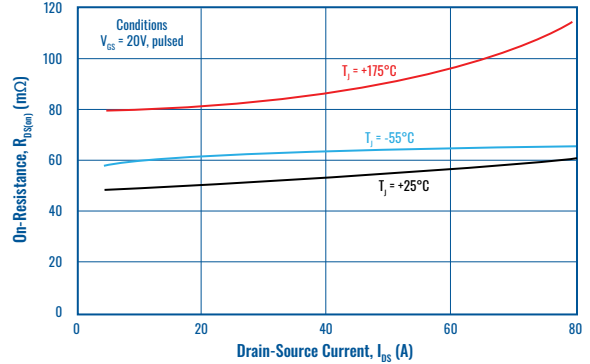


Fig 7: On-Resistance vs. Gate-Voltage vs. Junction Temperature

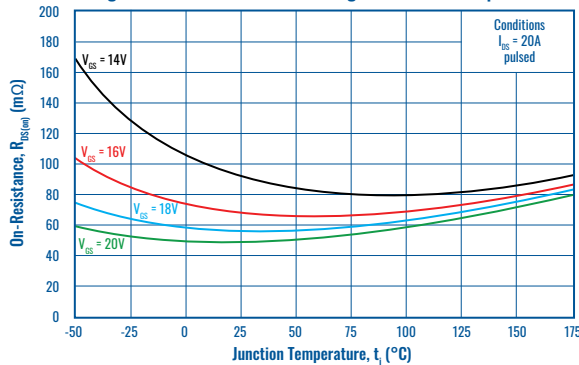
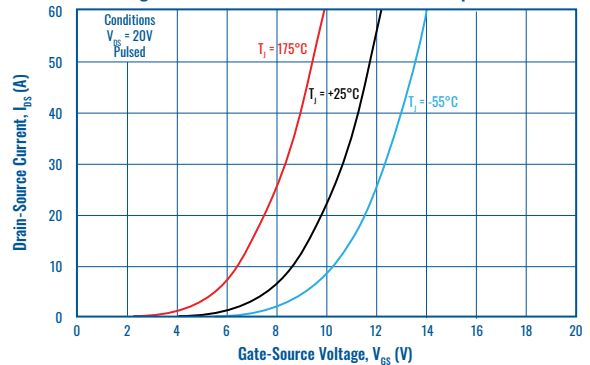


Fig 8: Transfer Characteristic vs. Junction Temperature



CHARACTERISTICS CONT.

Fig 9: Threshold Voltage vs. Temperature

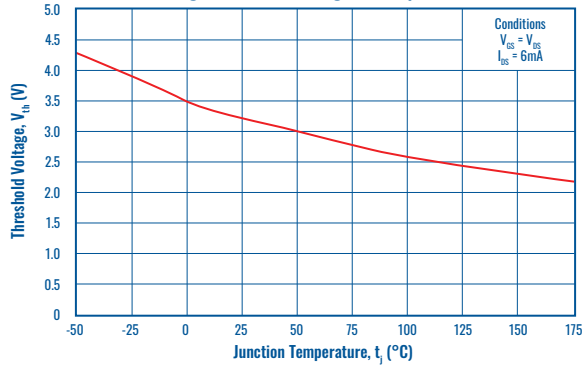


Fig 10: Body Diode Output Characteristics $T_j = -55^\circ C$

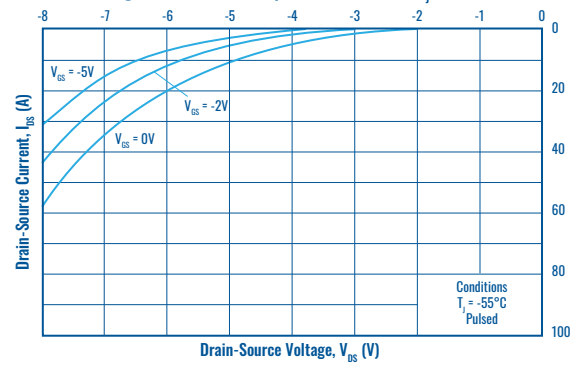


Fig 11: Body Diode Output Characteristics $T_j = 25^\circ C$

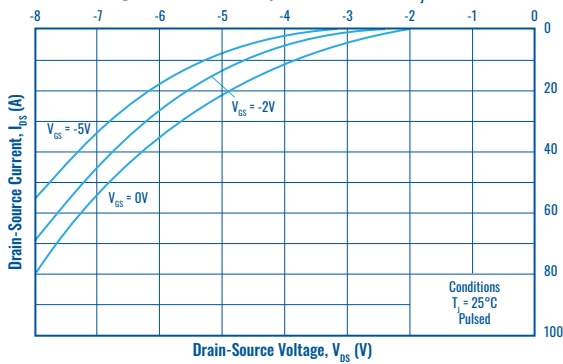


Fig 12: Body Diode Output Characteristics $T_j = 175^\circ C$

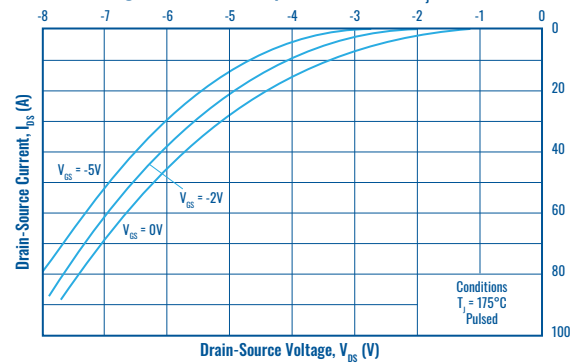


Fig 13: 3rd Quadrant Characteristics $T_j = -55^\circ C$

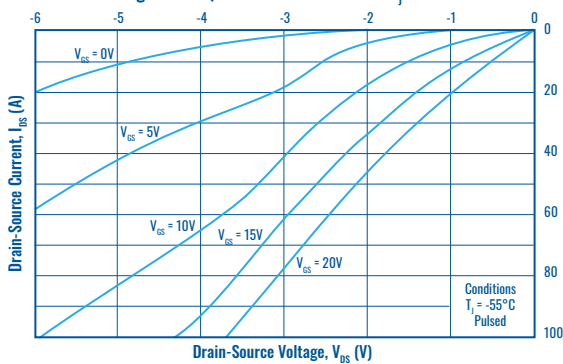


Fig 14: 3rd Quadrant Characteristics $T_j = 25^\circ C$

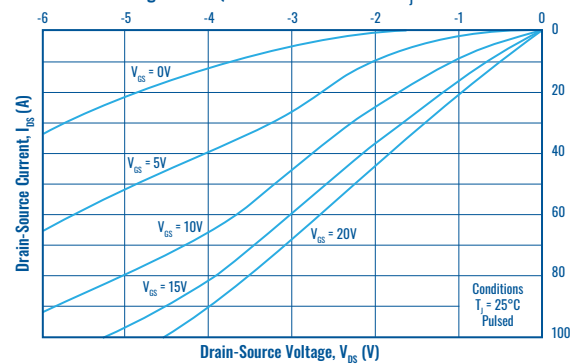


Fig 15: 3rd Quadrant Characteristics $T_j = 175^\circ C$

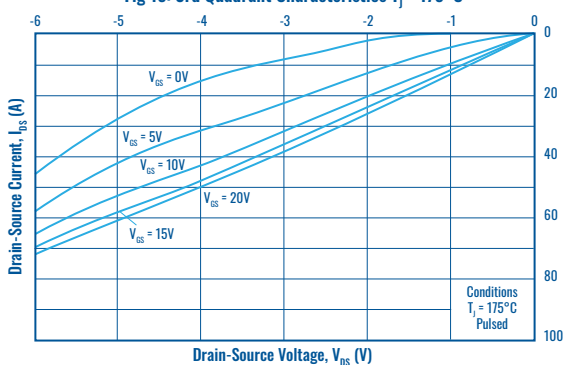
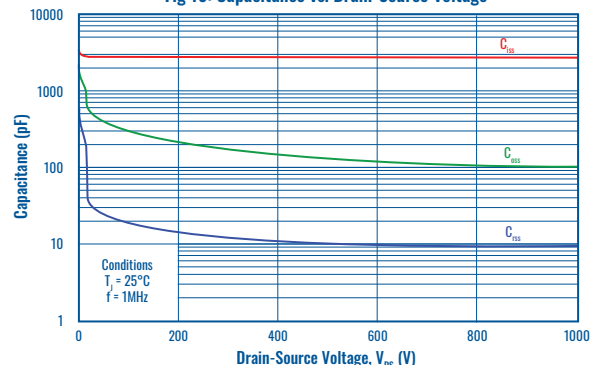
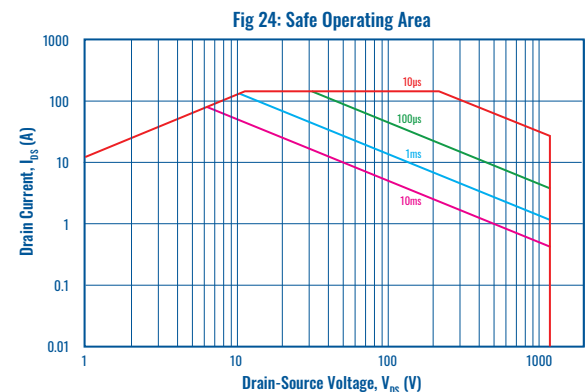
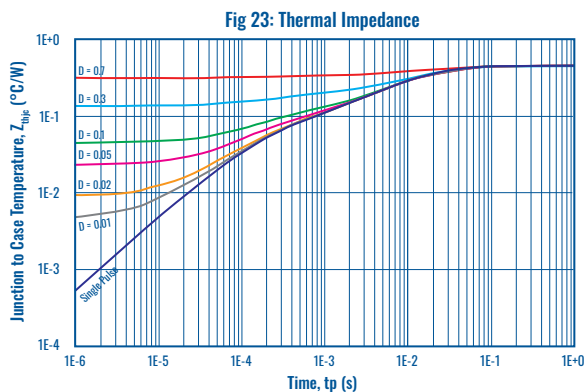
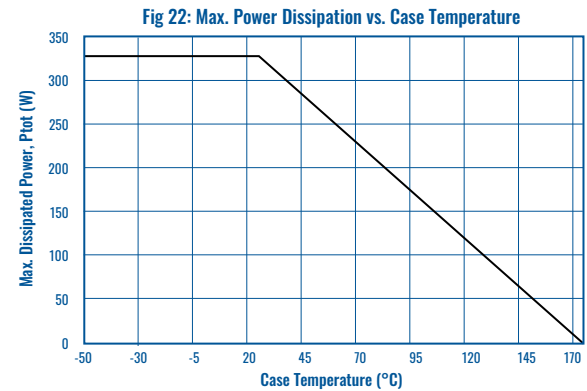
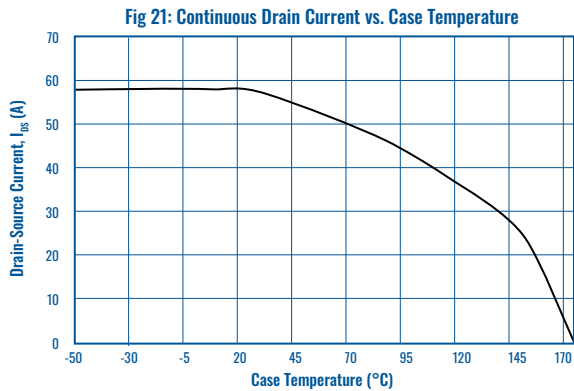
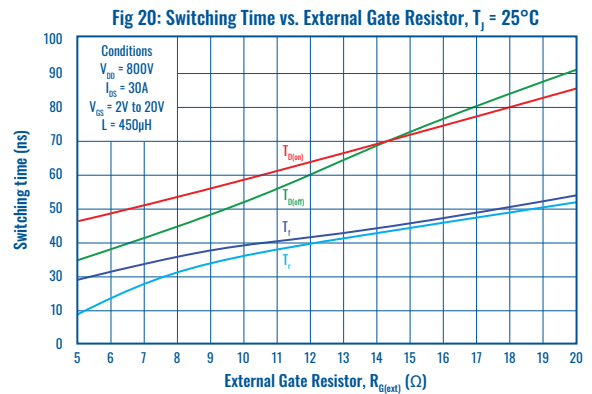
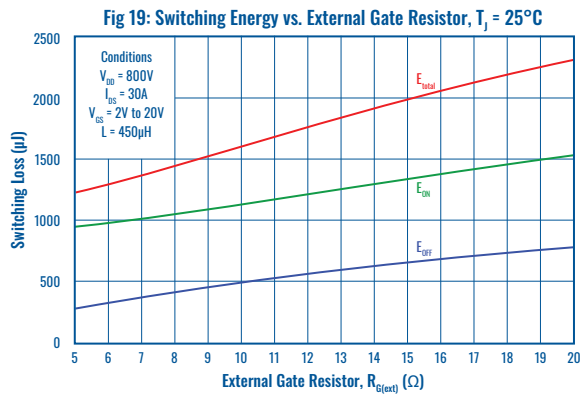
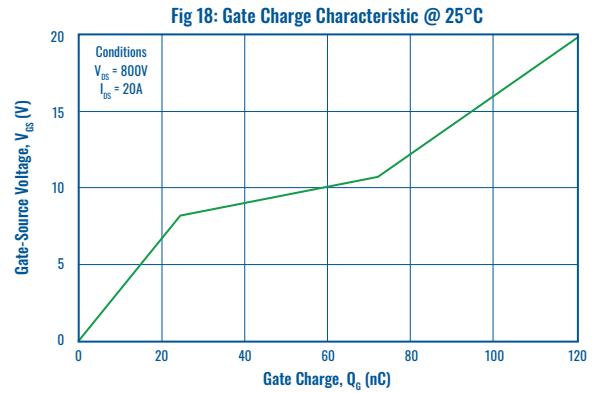
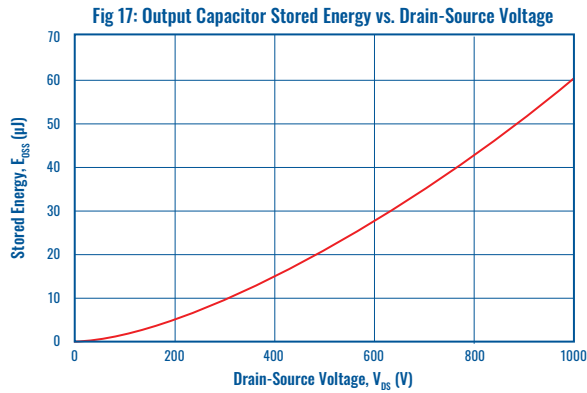


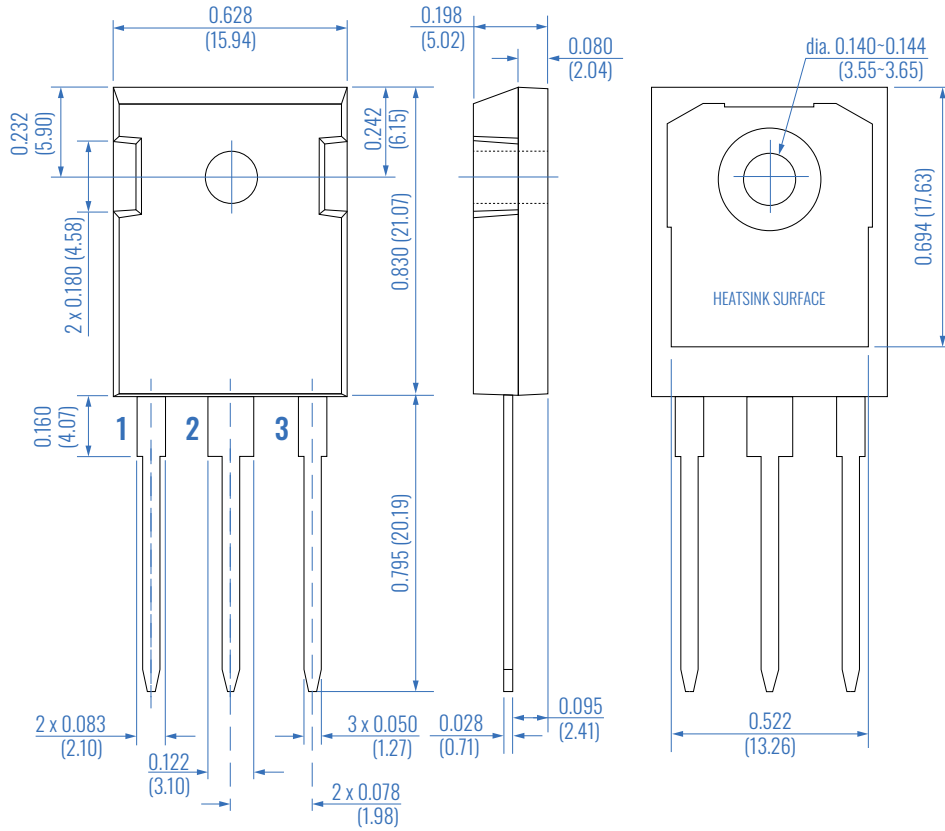
Fig 16: Capacitance vs. Drain-Source Voltage



CHARACTERISTICS CONT.



OUTLINE DIMENSIONS



PIN CONNECTIONS

