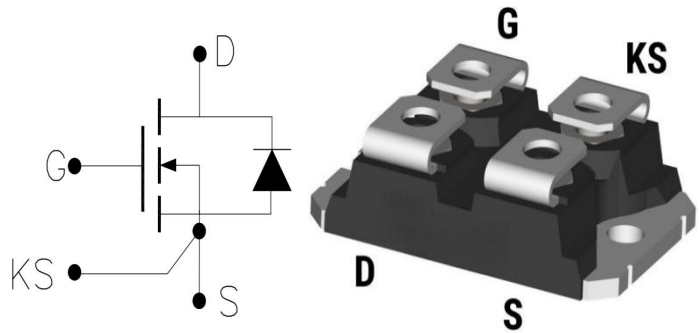


Single Unit SiC MOSFET Module

Parameter	Value	Unit
V_{DS}	1200	V
I_{DS}	110	A
$R_{DS(ON)}$	17	mΩ



Features:

- 1200V/17mΩ @ $T_j = 25^\circ\text{C}$, $V_{GS} = 18\text{V}$
- 175°C maximum junction temperature
- Low Device Capacitance (C_{oss} , C_{rss})
- Faster and More Efficient Switching

Applications:

- UPS
- Motor Drive
- EV Charging
- High Voltage DC-DC Converters
- Induction Heating and Welding
- Smart Grid Transmission and Distribution

Maximum Ratings ($T_j = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions		Ratings	Unit
Drain-Source Voltage	V _{DSS}	G-S Short		1200	V
Gate-Source Voltage	V _{GSS}	D-S Short, AC frequency ≥1Hz, Note1		-10 to +22	V
DC Continuous Drain Current	I _{DS}	V _{GS} =+15V	T _C =25℃	105	A
DC Continuous Drain Current	I _{DS}		T _C =100℃	75	A
DC Continuous Drain Current	I _{DS}	V _{GS} =+18V	T _C =25℃	110	A
DC Continuous Drain Current	I _{DS}		T _C =100℃	80	A
Pulse Drain Current	I _{DSM}	Pulse width≤3μs, V _{GS} =+15V, Note2		313	A
Total Power Dissipation	P _{tot}	T _C =25℃		350	W
Max Junction Temperature	T _{jmax}	-		175	℃
Storage Temperature	T _{stg}	-		-50 to 175	℃

Note1: Recommended Operating Value, +18V/-5V, +15V/-4V

Note2: Pulse width limited by maximum junction temperature

MOSFET Electrical Characteristics ($T_j = 25^\circ\text{C}$ unless otherwise specified, chip)

Symbol	Item	Condition		Value			Unit
				Min.	Typ.	Max	
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =100uA		1200	-	-	V
I _{DSS}	Zero gate voltage drain Current	V _{DS} =1200V, V _{GS} =0V		-	1	-	μA
V _{GS(th)}	Gate-source threshold Voltage	I _D =35mA, V _{DS} =V _{GS}	T _j =25°C	1.8	2.7	-	V
			T _j =175°C	-	2.05	-	V

I _{GSS}	Gate-Source Leakage Current	V _{GS} =22V, V _{DS} =0V	T _J =25℃	-	-	100	nA	
R _{DS(on)} (Chip)	Static drain-source On-state resistance	I _D =60A V _{GS} =+15V	T _J =25℃	-	20	-	mΩ	
			T _J =175℃	-	29	-	mΩ	
		I _D =60A V _{GS} =+18V	T _J =25℃	-	17	22.5	mΩ	
			T _J =175℃	-	25	-	mΩ	
V _{DS(on)} (Chip)	Static drain-source On-state Voltage	I _D =60A V _{GS} =+15V	T _J =25℃	-	1.20	-	V	
			T _J =175℃	-	1.74	-	V	
		I _D =60A V _{GS} =+18V	T _J =25℃	-	1.02	1.35	V	
			T _J =175℃	-	1.50	-	V	
C _{iss}	Input Capacitance	V _{DD} =800V, V _{GS} =0V, f =1MHz, V _{AC} =25mV		-	5814	-	pF	
C _{oss}	Output Capacitance			-	177	-	pF	
C _{rss}	Reverse transfer Capacitance			-	14.2	-	pF	
Q _g	Total gate charge	V _{DD} =800V, I _D =60A, V _{GS} =+15/-5V		-	180	-	nC	
R _{Gint}	Internal Gate Resistance	T _J =25℃		-	1.3	-	Ω	
t _{d(on)}	Turn-on delay time	V _{DD} =800V I _D =60A V _{GS} =+15/-4V R _{gon} =R _{goff} =1.0Ω Inductive load switching operation	T _J =25℃	-	45	-	ns	
			T _J =150℃	-	39	-		
t _r	Rise time		T _J =25℃	-	18	-	ns	
			T _J =150℃	-	16	-		
t _{d(off)}	Turn-off delay time		T _J =25℃	-	20	-	ns	
			T _J =150℃	-	25	-		
t _f	Fall time		T _J =25℃	-	11	-	ns	
			T _J =150℃	-	35	-		
E _{on}	Turn-on power dissipation		T _J =25℃	-	492	-	μJ	
			T _J =150℃	-	662	-		
E _{off}	Turn-off power dissipation		T _J =25℃	-	205	-	μJ	
			T _J =150℃	-	200	-		
R _{th(j-c)}	FET Thermal Resistance	Junction to Case		-	0.36	0.48	K/W	

Body Diode Electrical Characteristics (T_J =25℃ unless otherwise specified, chip: Target)

Symbol	Item	Condition		Value			Unit
				Min.	Typ.	Max	
V _{SD}	Body Diode Forward Voltage	V _{GS} = -5V I _{SD} =30A	T _J =25°C	-	4.6	-	V
			T _J =175°C	-	4.2	-	
T _{rr}	Reverse recovery time	V _{DD} =800V, I _D =60A V _{GS} =+15/-4V R _{gon} =R _{goff} =1.0Ω Inductive load switching operation	T _J =25°C	-	35	-	ns
			T _J =150°C	-	47	-	
Q _{rr}	Reverse recovery charge		T _J =25°C	-	240	-	nC
			T _J =150°C	-	475	-	
I _{rrm}	Reverse recovery current		T _J =25°C	-	14	-	A
			T _J =150°C	-	21	-	A

Module Characteristics

Parameter	Conditions	Value	Unit
Isolation Voltage	RMS, f =50Hz, t =1min	3.4	KV
CTI	-	>400	-
Mounting torque for module mounting	M4	1.5	Nm
Weight	-	28	g

Typical Characteristics

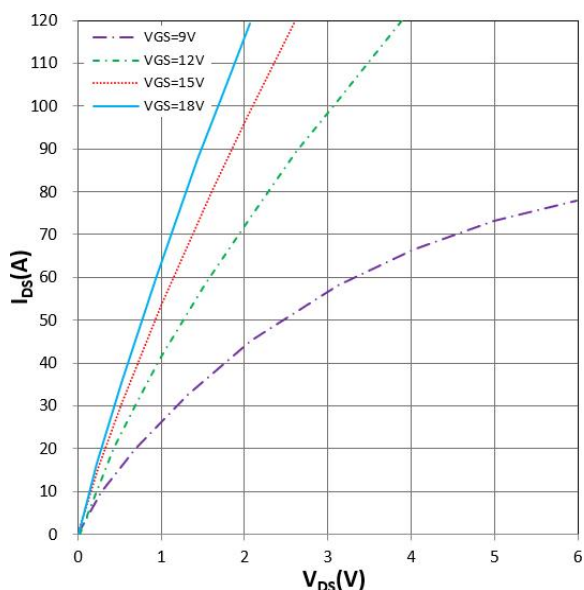


Fig 1. I_{DS} vs V_{DS} ($T_{vj}=25^{\circ}\text{C}$)

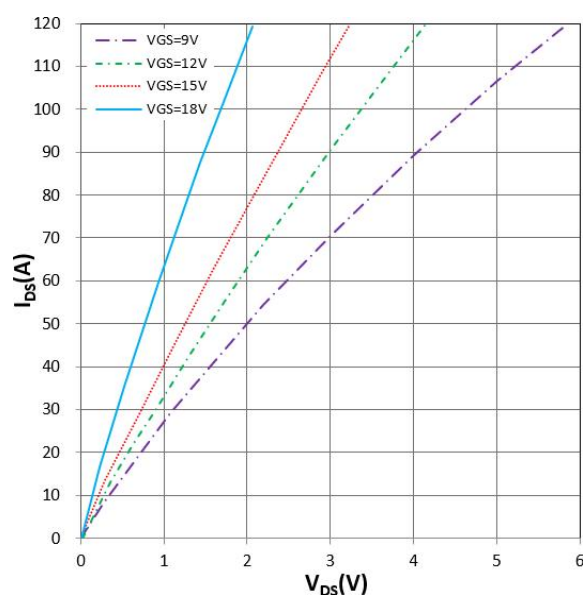


Fig 2. I_{DS} vs V_{DS} ($T_{vj}=175^{\circ}\text{C}$)

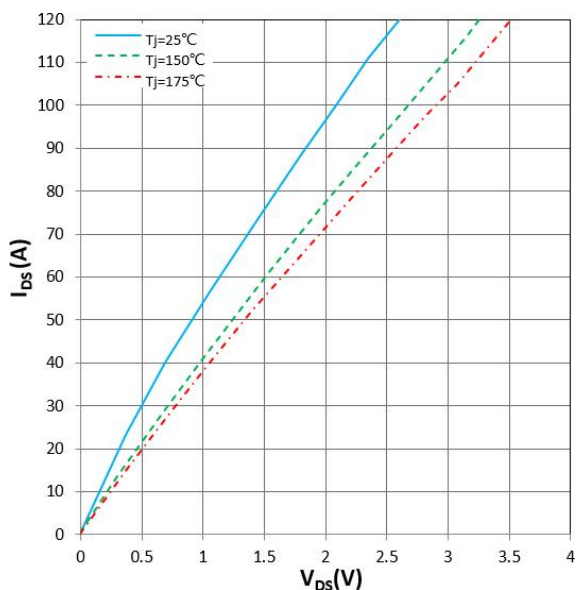


Fig 3. I_{SD} vs V_{SD} , $V_{GS}=\pm 15\text{V}$

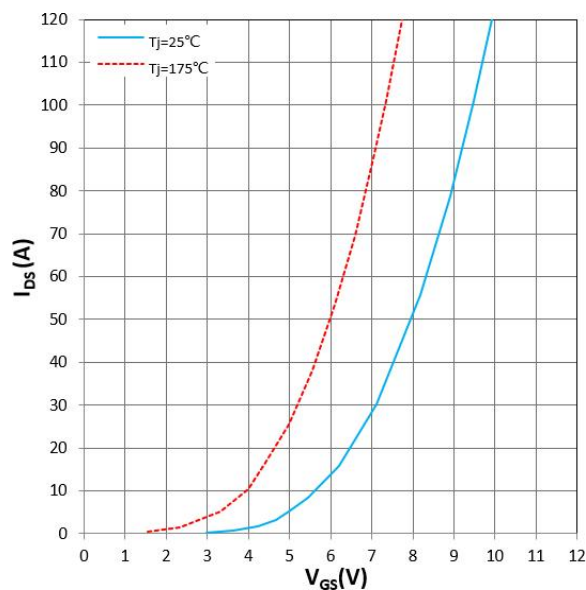


Fig 4. I_{DS} vs V_{GS} , $V_{DS}=+10\text{V}$

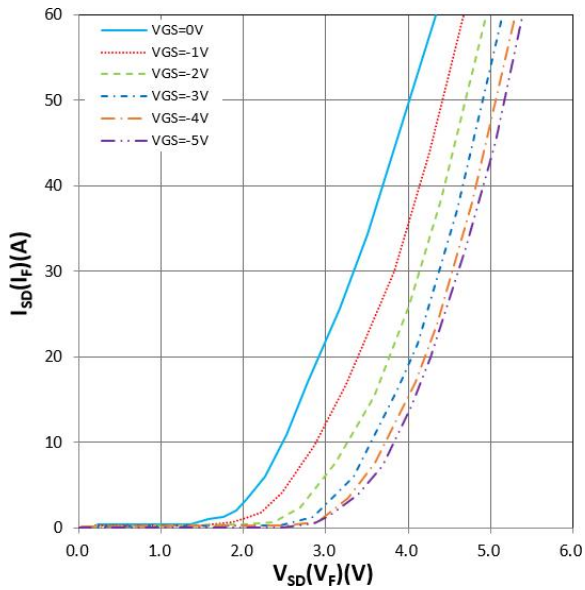


Fig 5. I_{SD} vs V_{SD} (V_F) , $T_J = 25^\circ\text{C}$

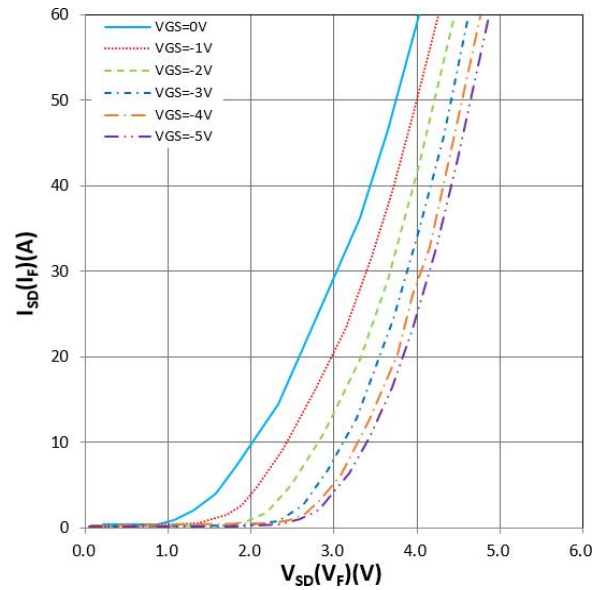


Fig 6. I_{SD} vs V_{SD} (V_F) , $T_J = 175^\circ\text{C}$

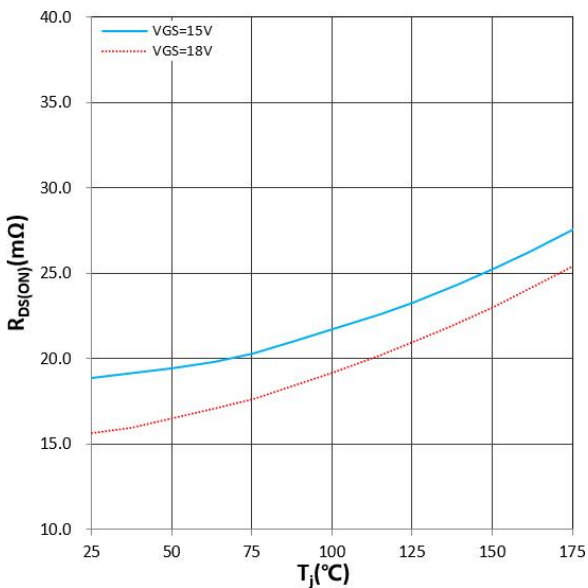


Fig 7. $R_{DS(ON)}$ vs T_J , $I_D = 60\text{A}$

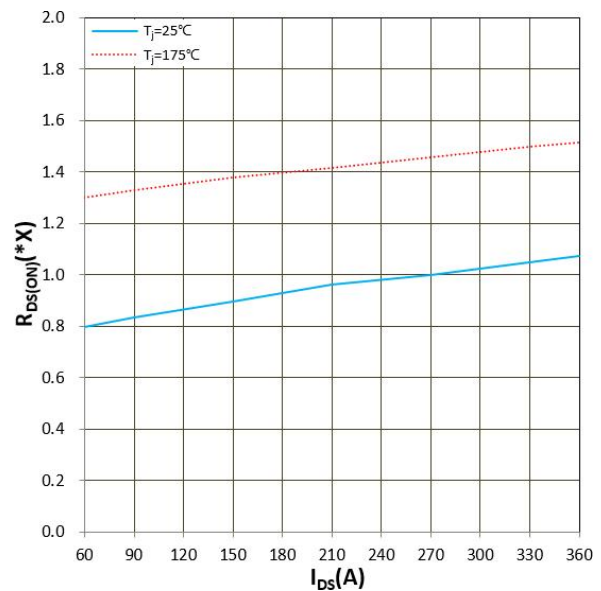


Fig 8. $R_{DS(ON)}$ vs I_{DS} , $V_{GS} = +15\text{V}$

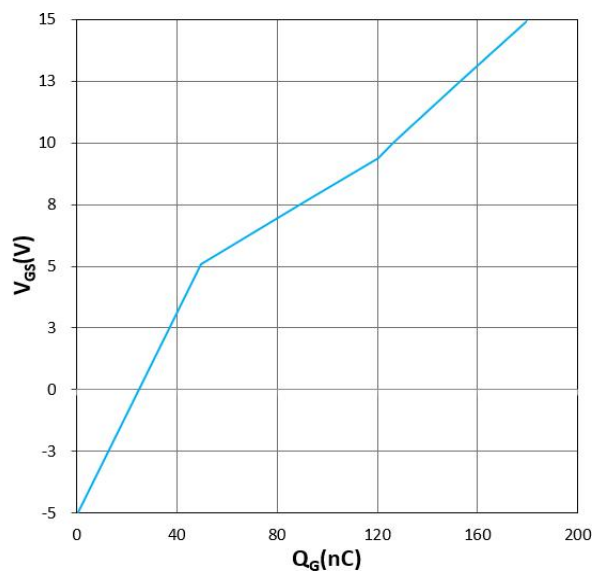


Fig 9. V_{GS} vs Q_g , $V_{DS} = 800\text{V}$, $I_D = 60\text{A}$, $T_J = 25^\circ\text{C}$

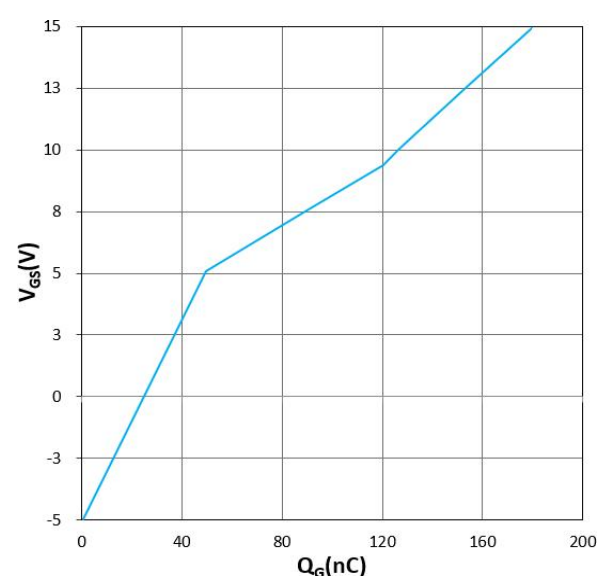


Fig 10. $V_{GS(TH)}$ vs T_J , $V_{GS} = V_{DS}$, $I_D = 35\text{mA}$

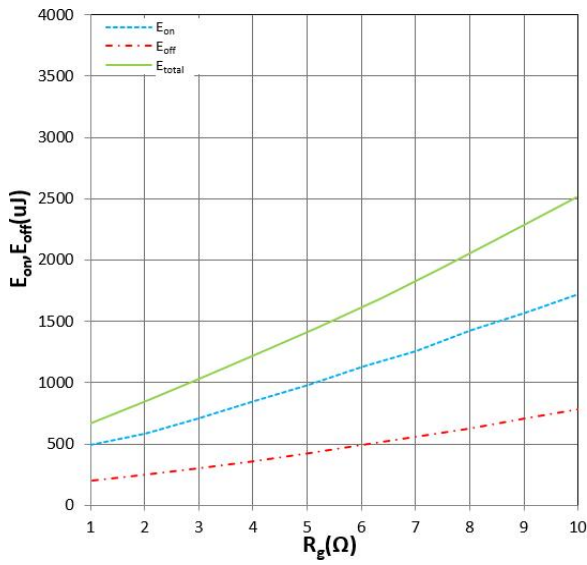


Fig 11. Eon, Eoff vs Rg

Tj=25°C, VCC=800V, VGS=+15V/-4V, ID=60A

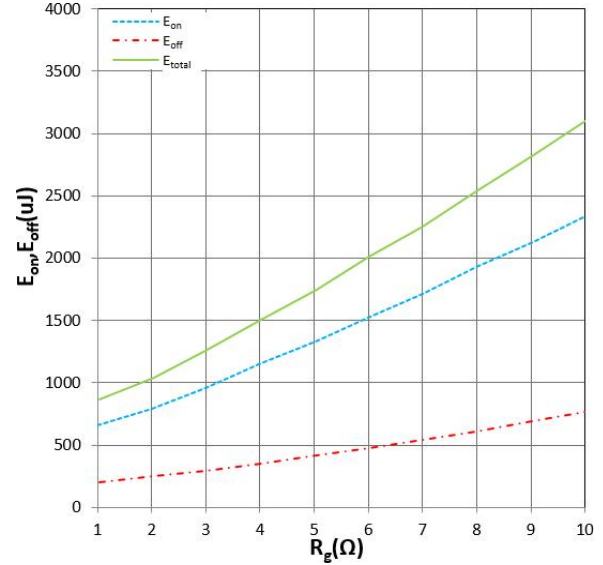


Fig 12. Eon, Eoff vs Rg

Tj=150°C, VCC=800V, VGS=+15V/-4V, ID=60A

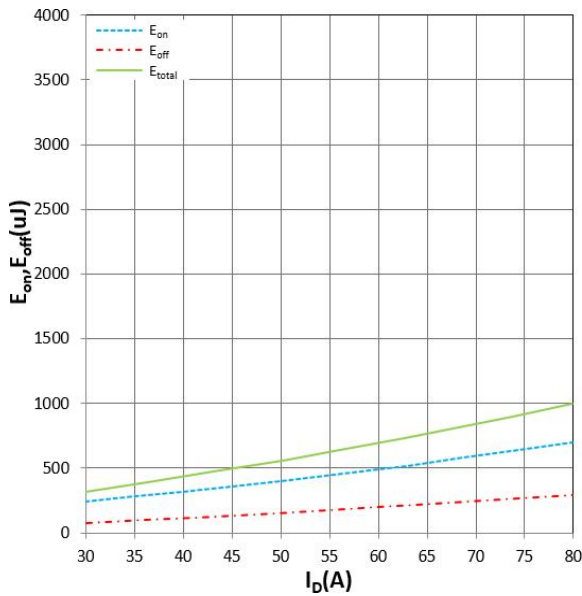


Fig 13. Eon, Eoff vs ID, Tj=25°C

VCC=800V, VGS=+15V/-4V
Rgon=Rgoff=1.0Ω, Inductive Load

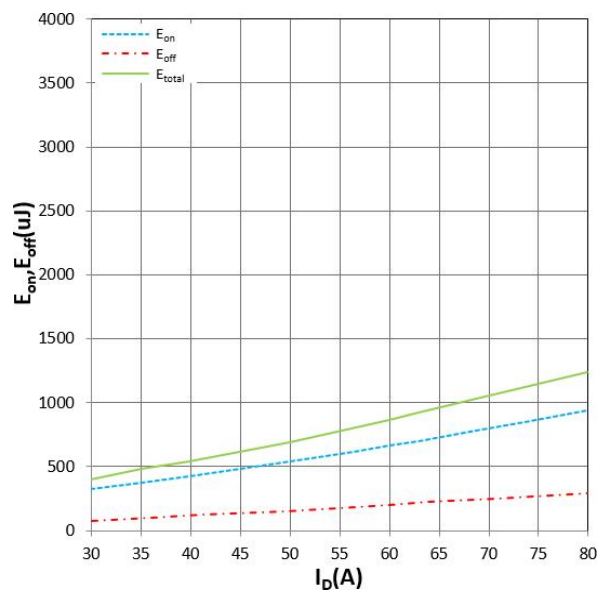


Fig 14. Eon, Eoff vs ID

Tj=150°C, VCC=800V, VGS=+15V/-4V
Rgon=Rgoff=1.0Ω, Inductive Load

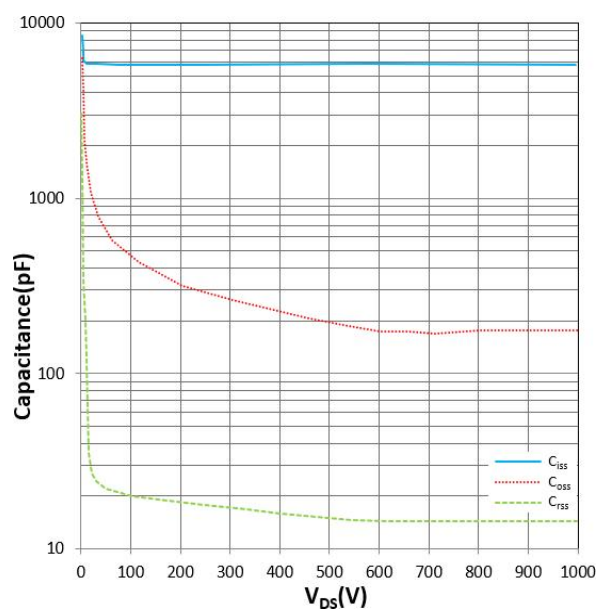
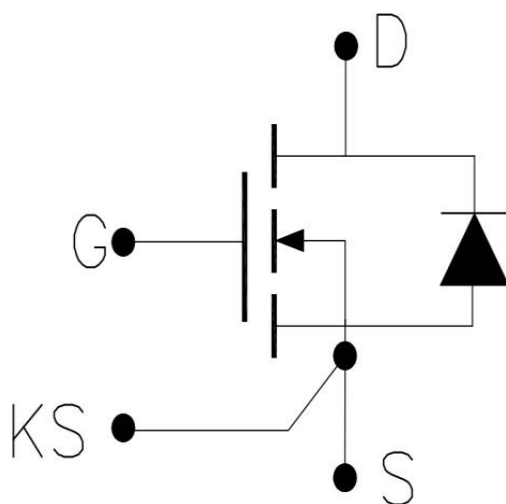


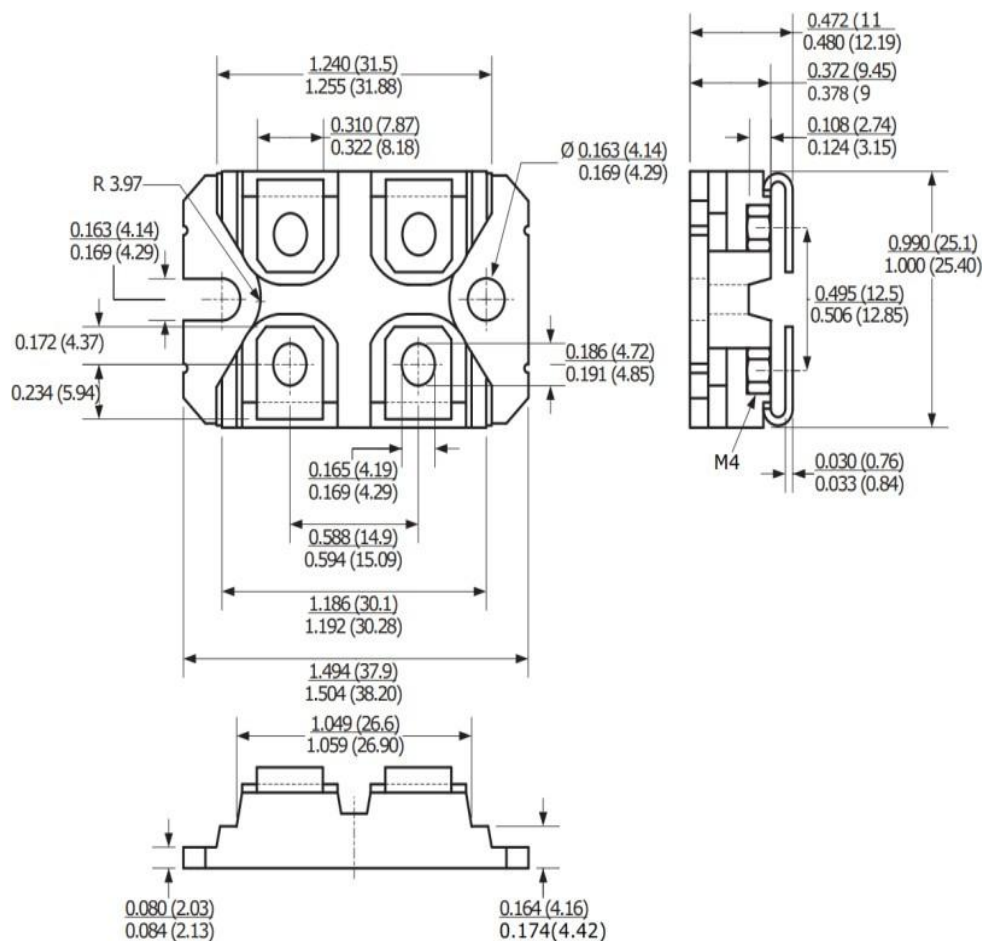
Fig 15. C_{ies}, C_{oss}, C_{rss} vs V_{DS}
T_j = 25°C, f = 1MHz, V_{AC} = 25mV

Circuit Diagram



Package Outline (Unit: mm):

TO-227



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