



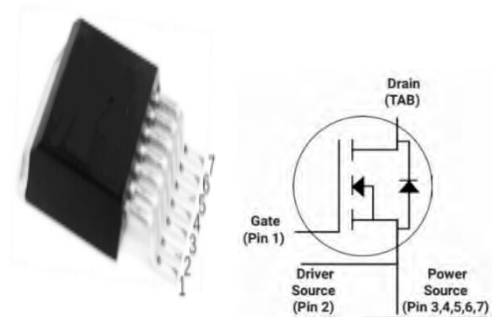
$V_{DS} = 1200\text{ V}$ $I_D@25^\circ\text{C} = 32\text{ A}$ $R_{DS(ON)} = 80\text{ m}\Omega$
--

Features

- Qualified to AEC-Q101
- High Blocking Voltage with Low On-Resistance
- High-Frequency Operation
- Ultra-Small Qgd
- 100% UIS tested

Standards Benefits

- Improve System Efficiency
- Increase Power Density
- Reduce Heat Sink Requirements
- Reduction of System Cost



TO-263-7L

Applications

- Solar Inverters
- EV Battery Chargers
- Reduce Heat Sink Requirements
- Reduction of System Cost

Drain	TAB
Gate	1
Driver Source	2
Power Source	3~7

Maximum Ratings (T_C=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Value	Unit
Drain - Source Voltage	V _{DSmax}	V _{GS} =-3V, I _D =100μA	1200	V
Gate - Source Voltage (dynamic)	V _{GSmax}	AC (f >1Hz)	-8 / +19	V
Gate - Source Voltage (static)	V _{GSmax (op)}	Static	-3 / +15	V
Continuous Drain Current	I _D	V _{GS} = 15V, T _C =25°C V _{GS} = 15V, T _C =100°C	32 23	A
Total power dissipation	P _D	T _C =25°C	136	W
Storage temperature range	T _{STG}		-55 to 175	°C
Operating Junction Temperature	T _J		-55 to 175	°C
Solder Temperature	T _L		260	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



LGE3M80120J

Silicon Carbide Power MOSFET



Electrical Characteristics (T_C=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = -3V, I _D = 100μA	1200			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 30mA	1.8	2.2		V
		V _{DS} = V _{GS} , I _D = 30mA, @T _C = 175°C		1.45		V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 1200V, V _{GS} = -3V		0.14	10	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = 15V, I _D = 20 A		20	250	nA
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = 20V, I _D = 10 A @T _J = 25°C		80	96	mΩ
		V _{GS} = 15V, I _D = 20 A @T _J = 125°C		80		
		V _{GS} = 15V, I _D = 20 A @T _J = 175°C		80		
Input capacitance	C _{iss}	V _{DS} = 800V, V _{GS} = 0V f = 1MHz, V _{AC} = 25mV		2070		pF
Output capacitance	C _{oss}			78		
Reverse transfer capacitance	C _{rss}			8		
C _{oss} Stored Energy	E _{oss}			53.1		
Total gate charge	Q _g	V _{DS} = 800V, V _{GS} = -3V to 15V I _D = 20mA,		57.2		nC
Gate-source charge	Q _{gs}			20.8		
Gate-drain charge	Q _{gd}			13.5		
Internal gate input resistance	R _{g(int)}	f = 1MHz, V _{AC} = 25mV		1.76		Ω
Trans conductance	g _{fs}	V _{DS} = 20V, I _{DS} = 20A T _J = 25°C		10.6		S
		V _{DS} = 20V, I _{DS} = 20A T _J = 175°C		11.5		



LGE3M80120J

Silicon Carbide Power MOSFET



Reverse Diode Characteristics (T_C=25°C unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Diode Forward Voltage	V _{SD}	V _{GS} = -3V, I _{SD} = 10A,		4.8		V
		V _{GS} = -3V, I _{SD} = 10A, T _J = 175°C		4.6		
Reverse Recovery time	I _S	V _{GS} = -3V		22		A

Thermal Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Thermal Resistance	R _{th(j-c)}	junction-case		1.1		°C/W

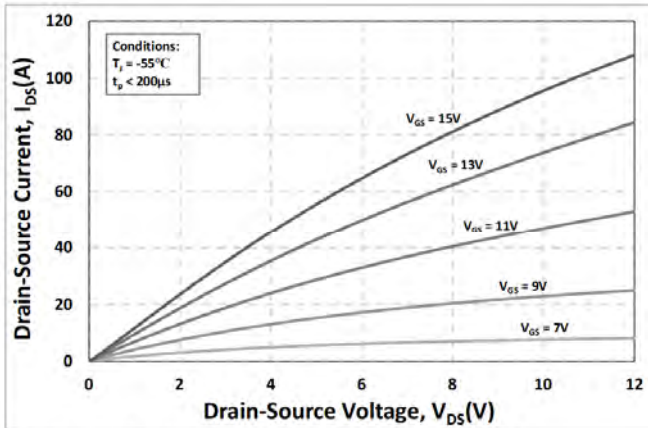
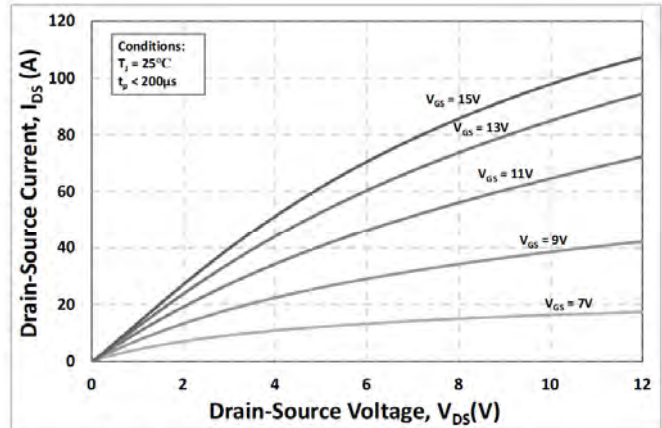
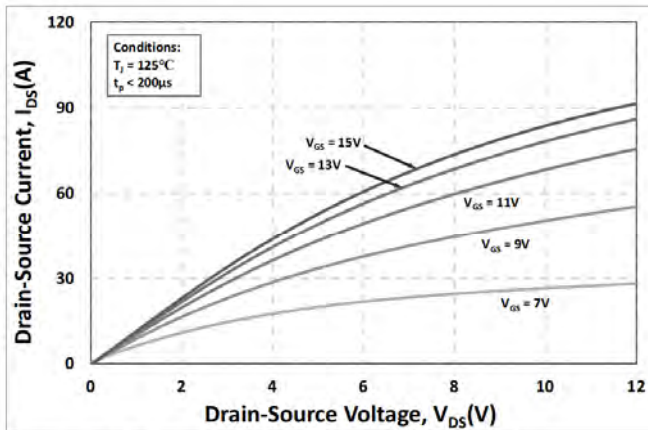
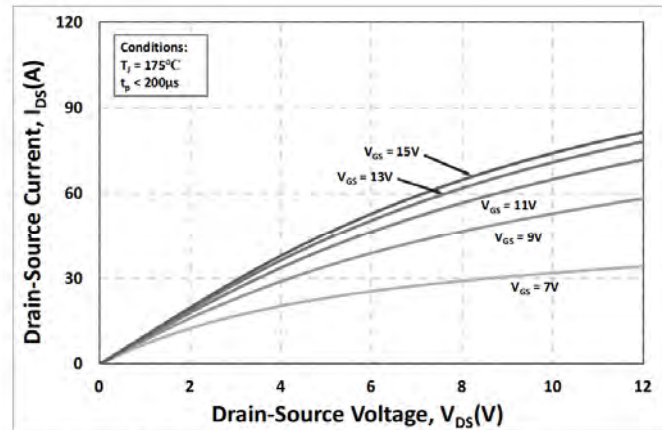
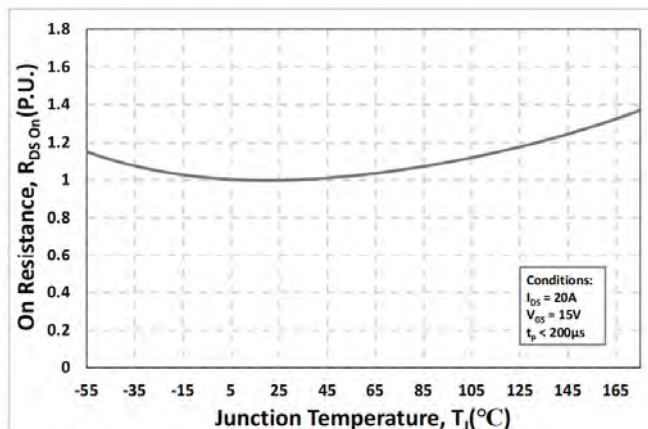

 Figure 1. Output Characteristics T_J = -55°C

 Figure 2. Output Characteristics T_J = 25°C

 Figure 3. Output Characteristics T_J = 125°C

 Figure 4. Output Characteristics T_J = 175°C


Figure 5. Normalized On-Resistance vs. Temperature

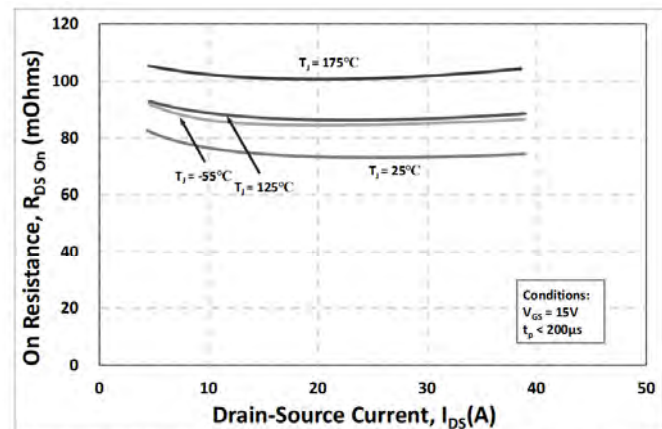


Figure 6. On-Resistance vs. Drain Current Various Temperatures

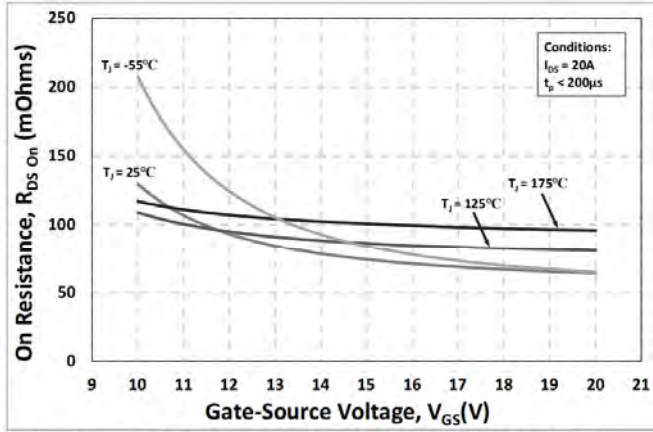


Figure 7. On-Resistance vs. Gate-Source Voltage

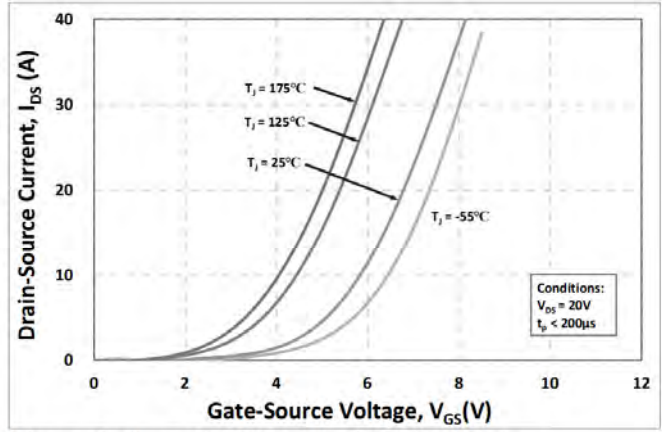


Figure 8. Transfer Characteristic for Various Junction Temperatures

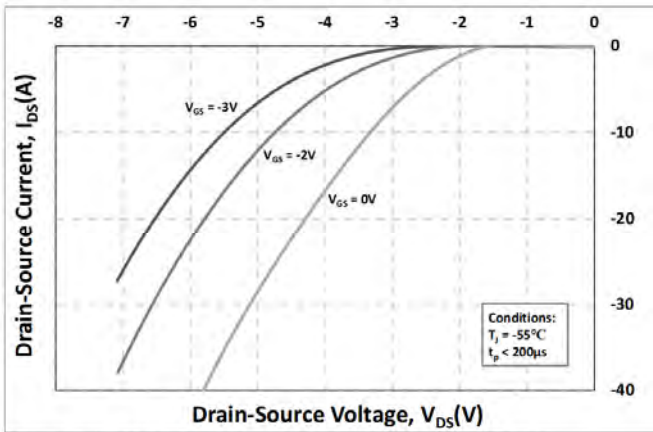


Figure 9. Body Diode Characteristic at -55°C

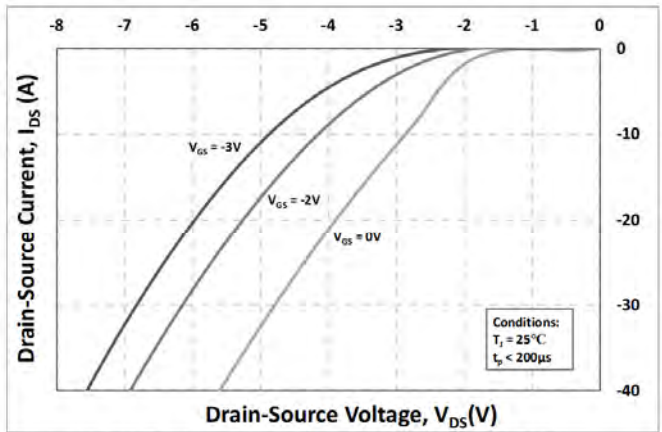


Figure 10. Body Diode Characteristic at 25°C

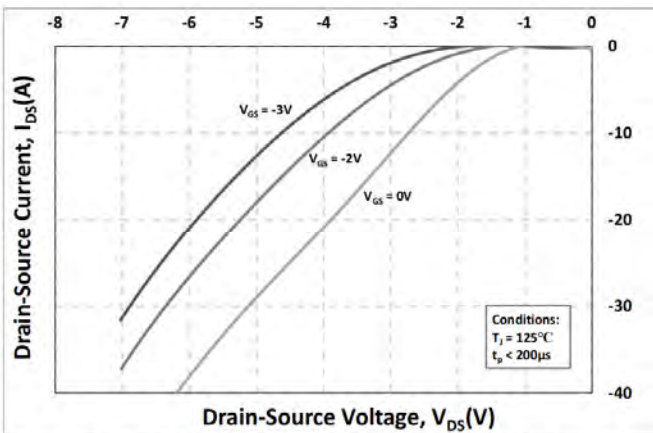


Figure 11. Body Diode Characteristic at 125°C

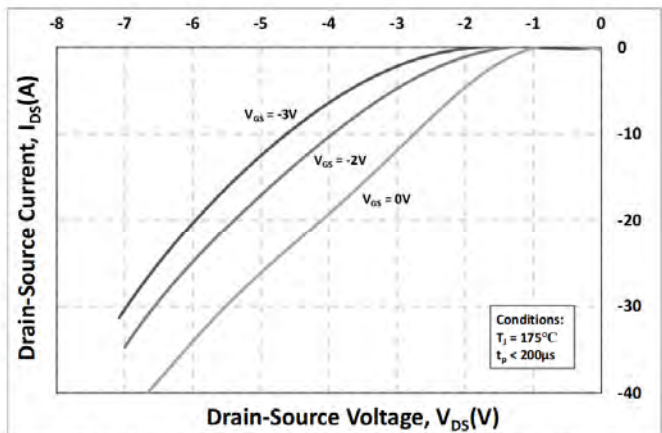


Figure 12. Body Diode Characteristic at 175°C

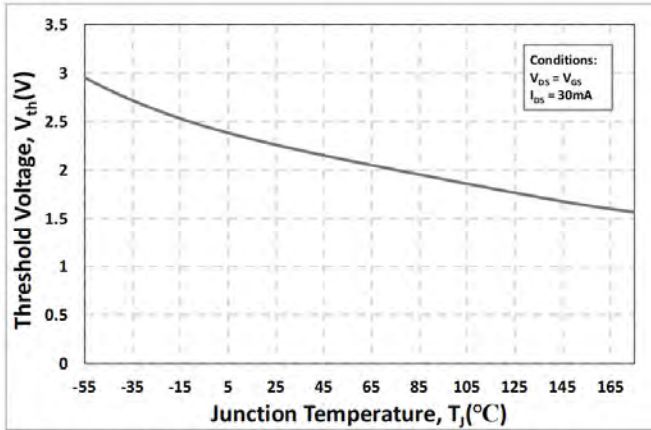


Figure 13. Threshold Voltage vs. Temperature

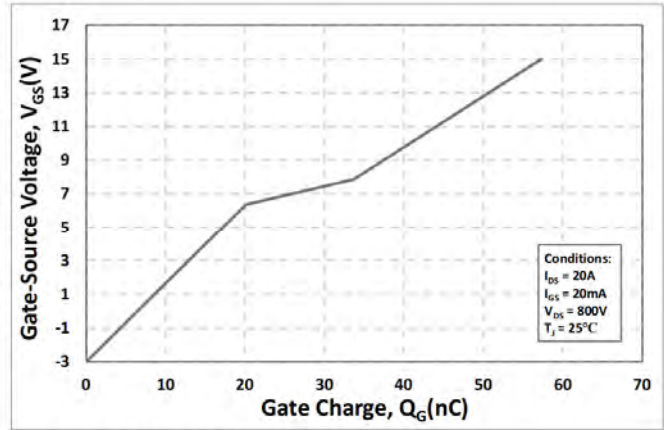


Figure 14. Gate Charge Characteristics

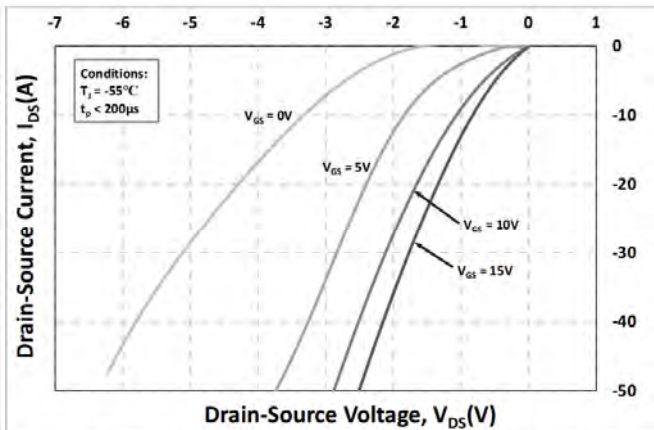


Figure 15. 3rd Quadrant Characteristic at -55°C

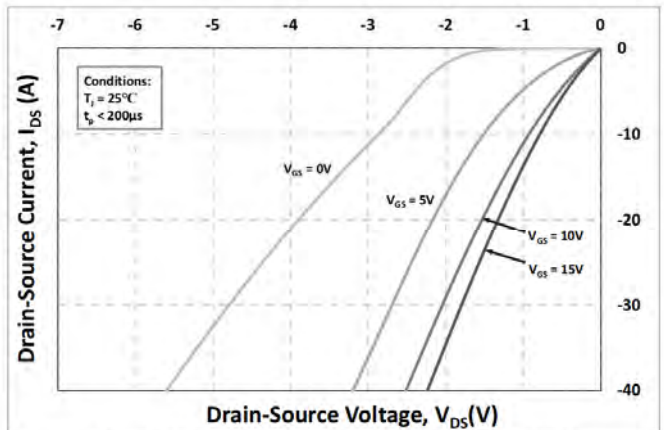


Figure 16. 3rd Quadrant Characteristic at 25°C

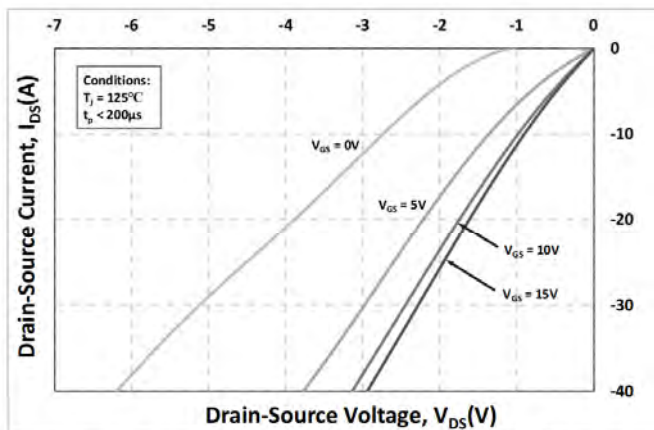


Figure 17. 3rd Quadrant Characteristic at 125°C

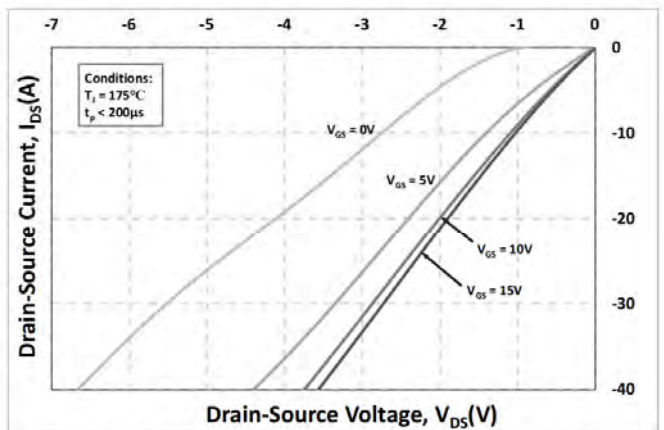


Figure 18. 3rd Quadrant Characteristic at 175°C



LGE3M80120J

Silicon Carbide Power MOSFET

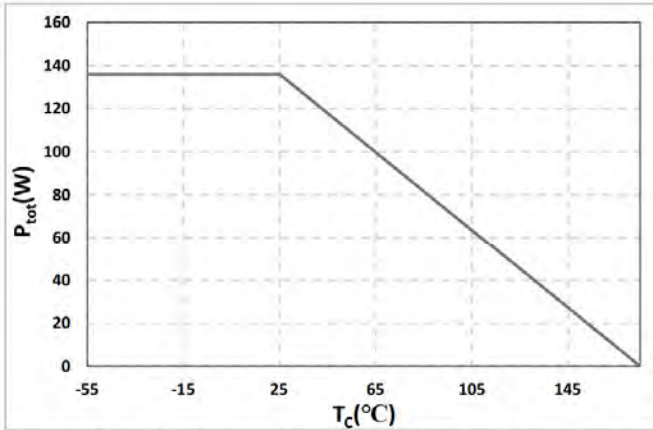


Figure 19. Maximum Power Dissipation Derating vs. Case Temperature

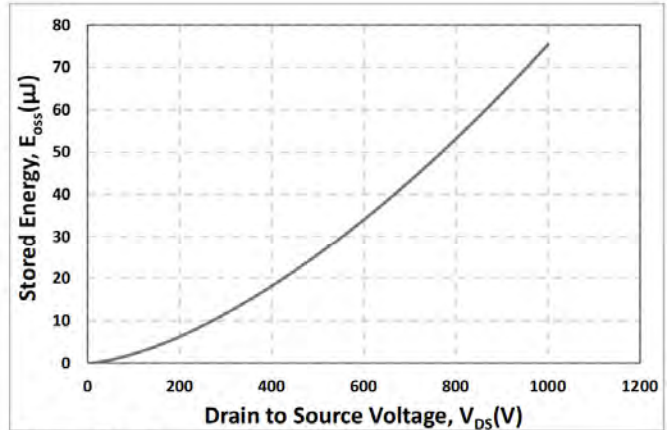


Figure 20. Output Capacitor Stored Energy

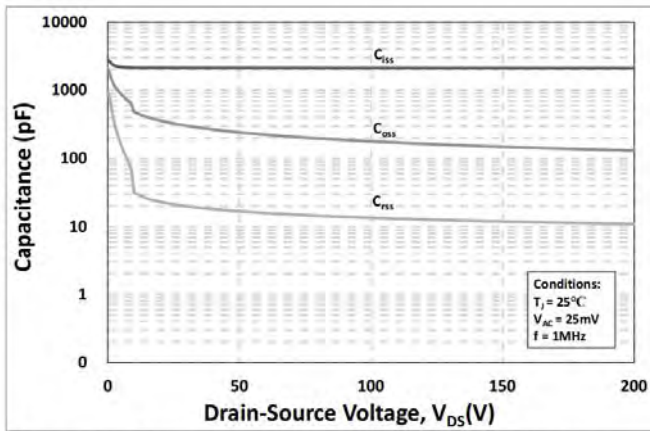


Figure 21. Capacitances vs. Drain-Source Voltage (0 - 200V)

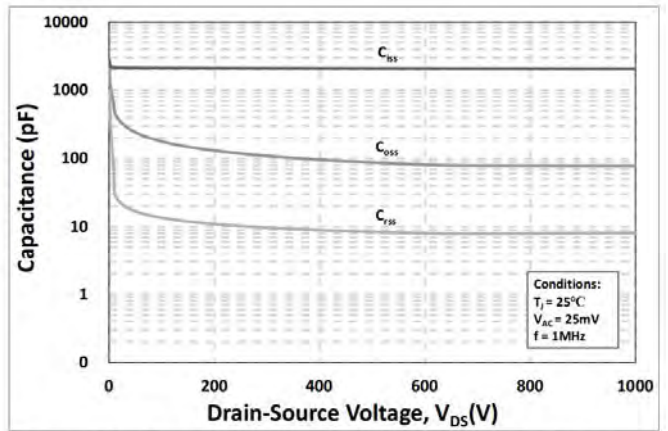
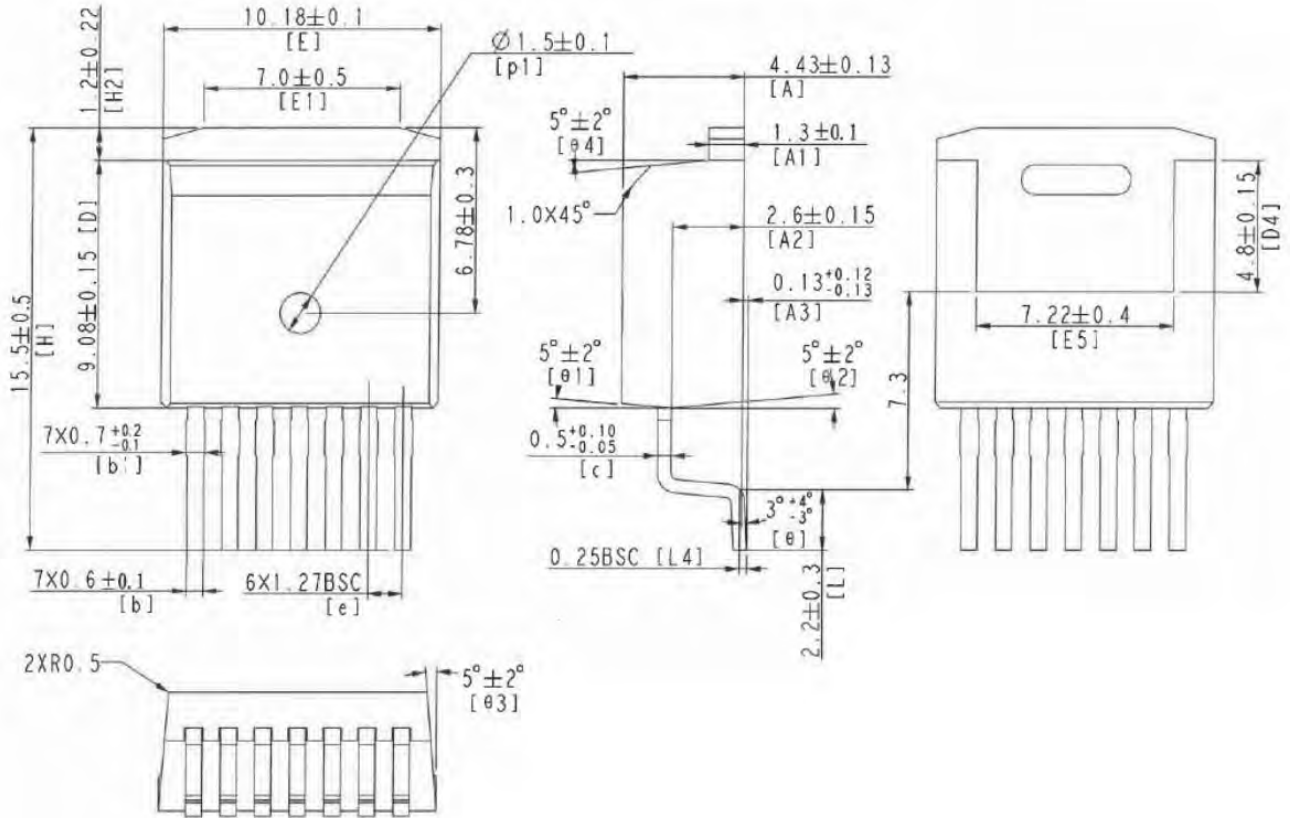


Figure 22. Capacitances vs. Drain-Source Voltage (0 - 1000V)

Package Dimensions

(TO-263-7L Package)



Drawing and dimensions