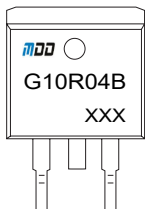


V_{DS}	100V
$I_D(T_c=25^{\circ}C)$	135A
$R_{DS(on)}$	3.6m Ω @ $V_{GS}=10V$

Features

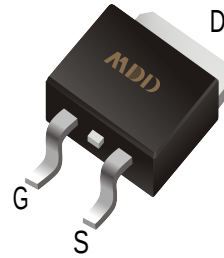
- Low $R_{DS(ON)}$ & FOM
- Extremely low switching loss
- Excellent reliability and uniformity
- Fast switching and soft recovery

Marking



XXX: Date Code

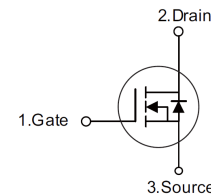
TO-263-3



Application

- Battery management
- Power management for inverter systems
- Switching voltage regulator DC-DC converter
- Switched mode power supply

Equivalent Circuit



Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current($T_c=25^{\circ}C$)	I_D	135	A
Continuous Drain Current($T_c=100^{\circ}C$)		105	A
Pulsed Drain Current (Note 1)	$I_{D,pulse}$	548	A
Thermal Resistance, Junction-Case	$R_{\theta JC}$	0.75	$^{\circ}C/W$
Thermal Resistance, Junction-Ambient(Note 2)	$R_{\theta JA}$	62	$^{\circ}C/W$
Avalanche Current	E_{AS}	340	mJ
Power Dissipation(Note 3)	P_D	214	W
Junction Temperature	T_J	-55 ~+150	$^{\circ}C$
Storage Temperature	T_{stg}	-55 ~+150	$^{\circ}C$

Note

¹⁾ See Diagram 3

²⁾ Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70 μ m thick) copper area for drain connection. PCB is vertical in still air.



Ta = 25°C unless otherwise specified

Symbol	Parameter		Condition	Min	Typ	Max	Unit
V_{(BR)DSS}	Drain-Source Breakdown Voltage		V_{GS}=0V, I_D=250μA	100	--	--	V
I_{GSS}	Gate-Source Leakage Current	Forward	V_{GS}=20V	--	--	100	nA
		Reverse	V_{GS}=-20V	--	--	-100	nA
I_{DSS}	Drain-Source Leakage Current		V_{DS}=100V, V_{GS}=0V	--	--	1	uA
V_{GS(TH)}	Gate Threshold Voltage		V_{DS}=V_{GS}, I_D=250μA	2	--	4	V
R_{DS(ON)}	Drain-Source On-State Resistance		V_{GS}=10V, I_D=30A	--	3.6	4.2	mΩ

Dynamic Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	V_{GS}=0V V_{DS}=50V f=100kHz	--	6320	--	pF
C_{oss}	Output Capacitance		--	1210	--	pF
C_{rss}	Reverse Transfer Capacitance		--	41	--	pF
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=50V, I_D=100A	--	88	--	nC
Q_{gs}	Gate Source Charge		--	30	--	nC
Q_{gd}	Gate Drain Charge		--	16	--	nC

Switching Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
t_{d(on)}	Turn on Delay Time	V_{GS}=10V, V_{DS} =50V, I_D=50A, R_G=1.6Ω	--	27	--	ns
t_r	Turn on Rise Time		--	59	--	ns
t_{d(off)}	Turn Off Delay Time		--	48	--	ns
t_f	Turn Off Fall Time		--	14	--	ns

Source Drain Diode Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{SD}	Drain-Source Diode Forward Voltage	I_S=20A, V_{GS}=0V	--	--	1.3	V
t_{rr}	Body Diode Reverse Recovery Time	I_S=20A, dI_S/dt=100A/μs	--	68	--	ns
Q_{rr}	Body Diode Reverse Recovery Charge		--	135	--	nC

Electrical Characteristics Diagrams

Diagram 1: Power dissipation

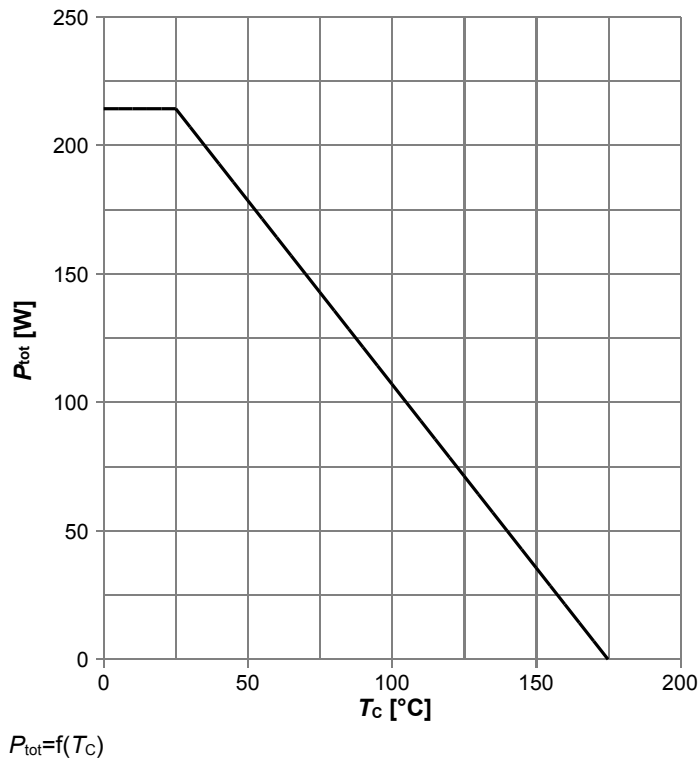


Diagram 2: Drain current

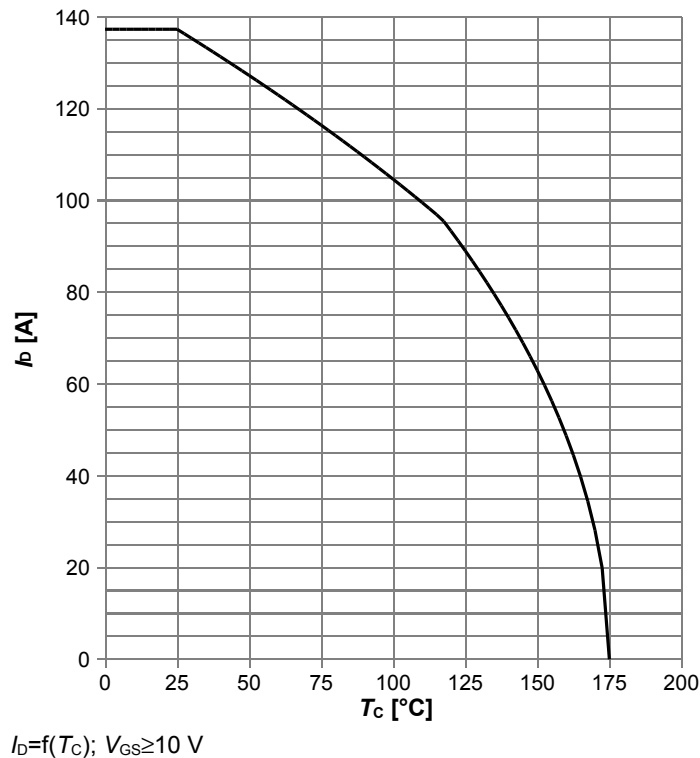


Diagram 3: Safe operating area

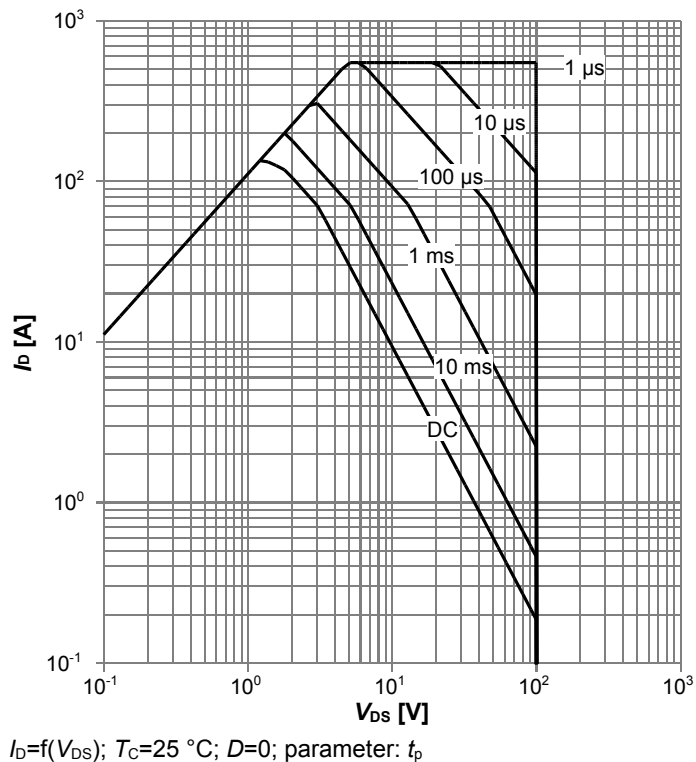


Diagram 4: Max. transient thermal impedance

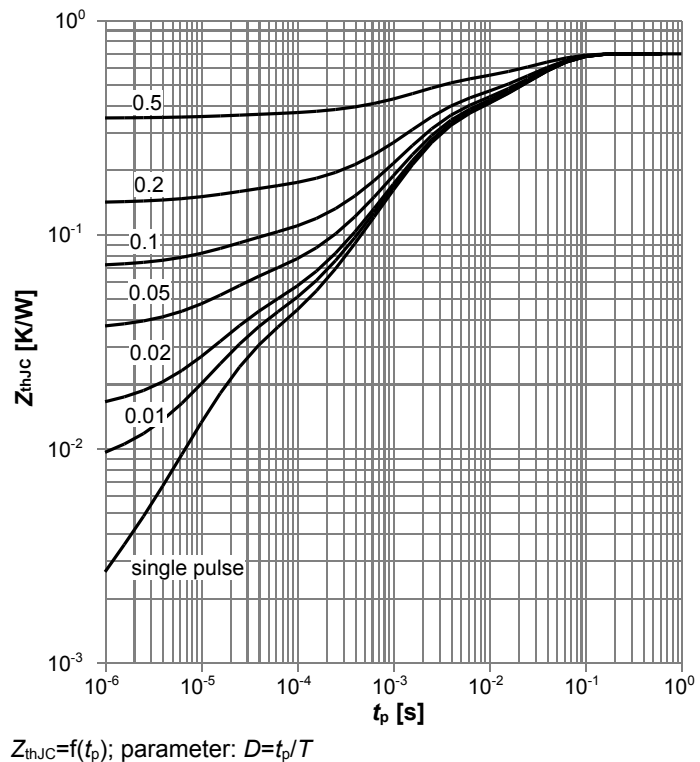
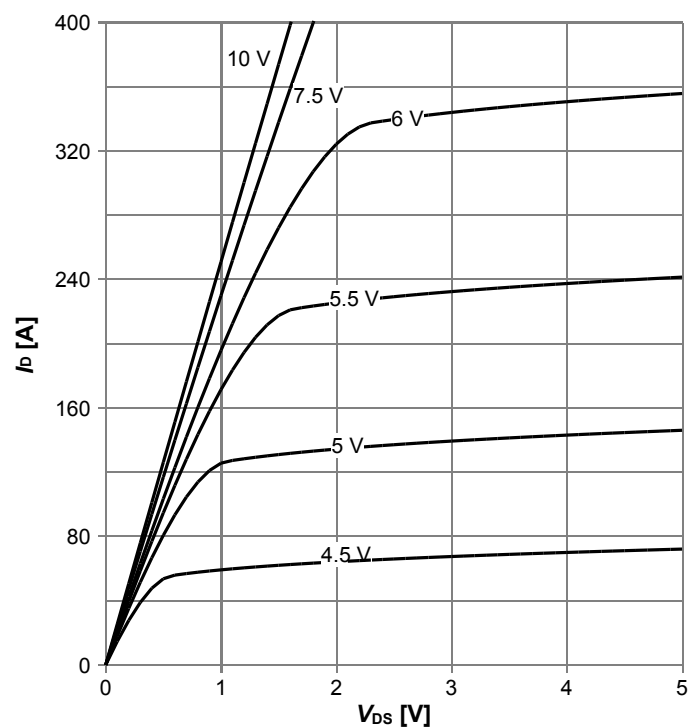
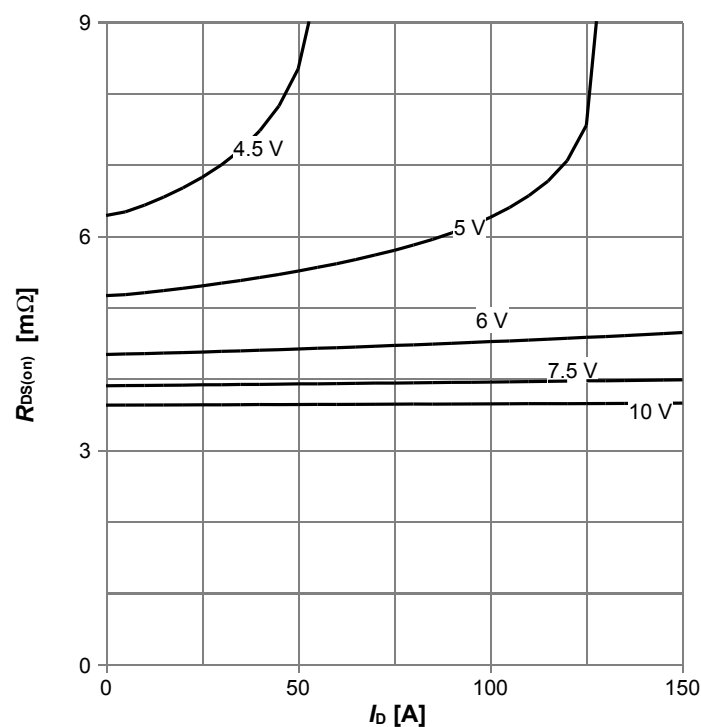


Diagram 5: Typ. output characteristics



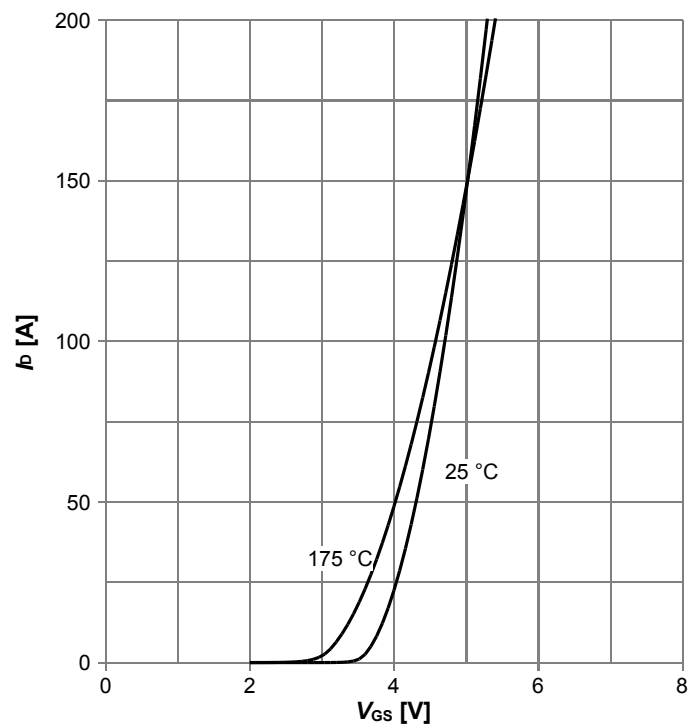
$I_D = f(V_{DS})$; $T_j = 25^\circ\text{C}$; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



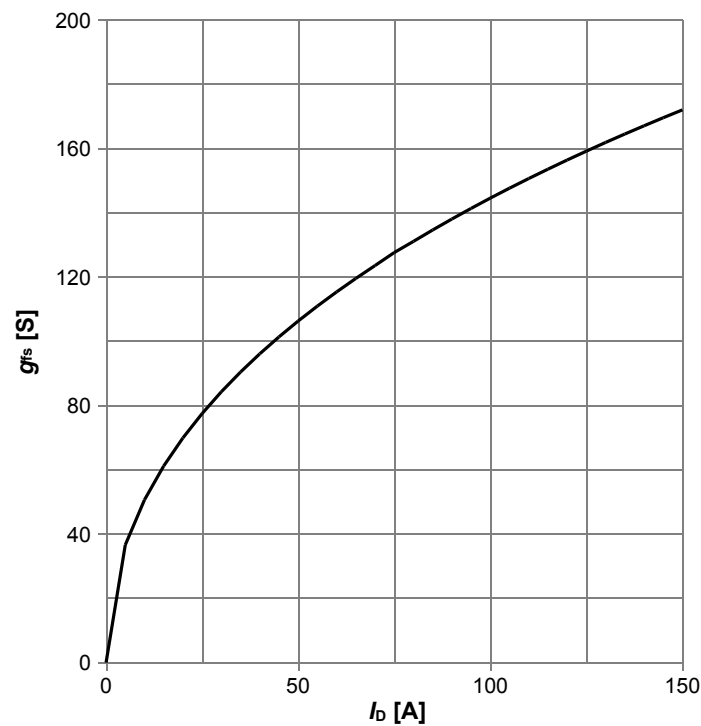
$R_{DS(on)} = f(I_D)$; $T_j = 25^\circ\text{C}$; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics



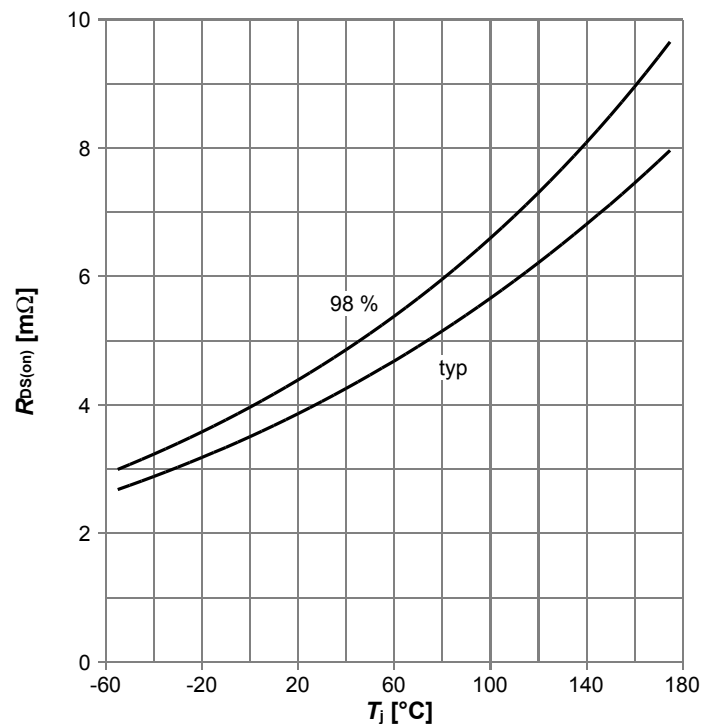
$I_D = f(V_{GS})$; $|V_{DS}| > 2|I_D|R_{DS(on)max}$; parameter: T_j

Diagram 8: Typ. forward transconductance



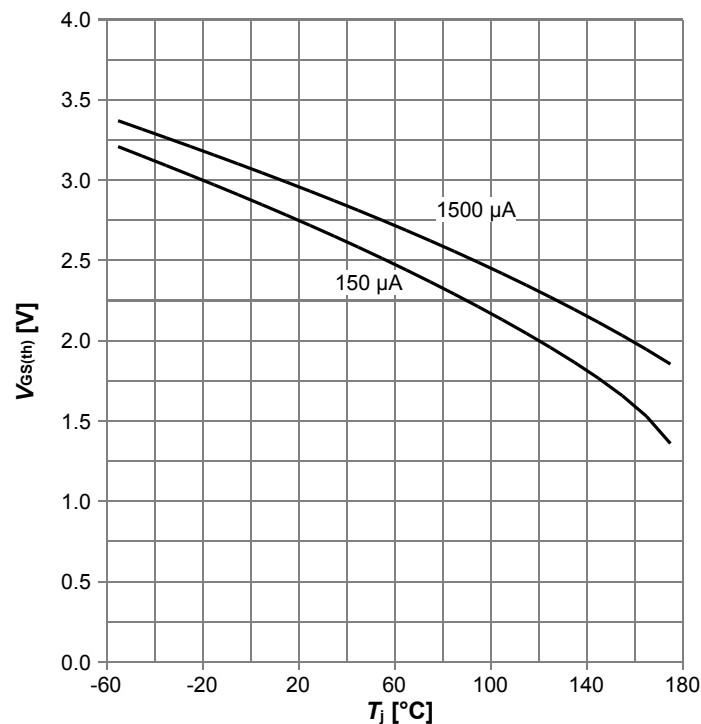
$g_{fs} = f(I_D)$; $T_j = 25^\circ\text{C}$

Diagram 9: Drain-source on-state resistance



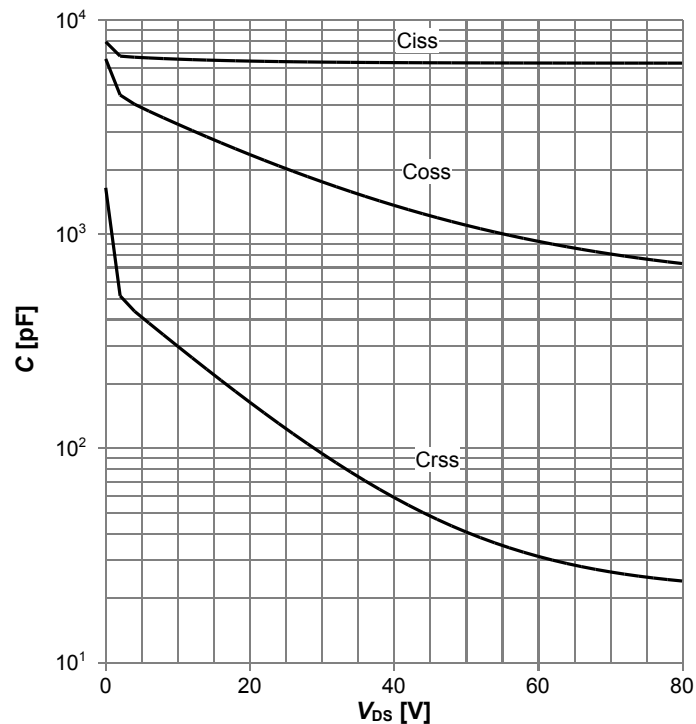
$$R_{DS(on)} = f(T_j); I_D = 100 \text{ A}; V_{GS} = 10 \text{ V}$$

Diagram 10: Typ. gate threshold voltage



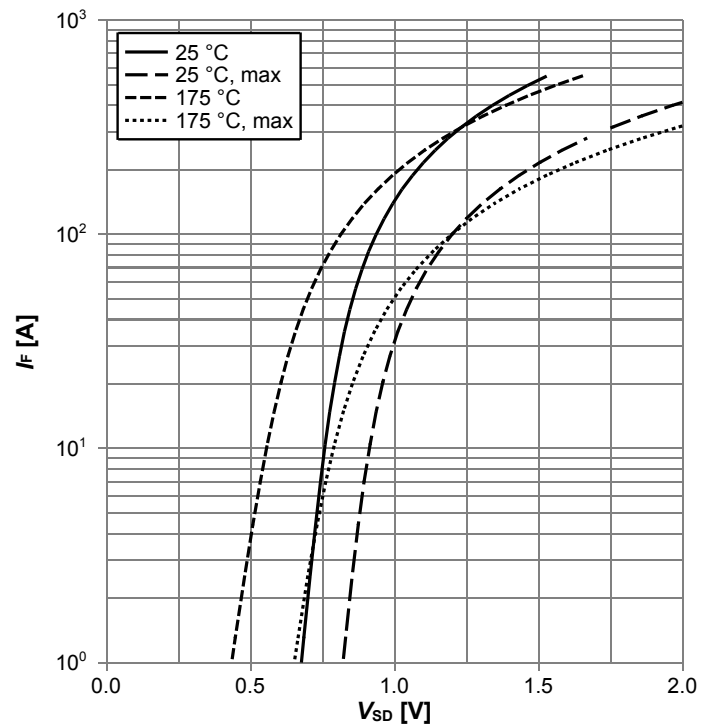
$$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}; \text{parameter: } I_D$$

Diagram 11: Typ. capacitances



$$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$$

Diagram 12: Forward characteristics of reverse diode



$$I_F = f(V_{SD}); \text{parameter: } T_j$$

Diagram 13: Avalanche characteristics

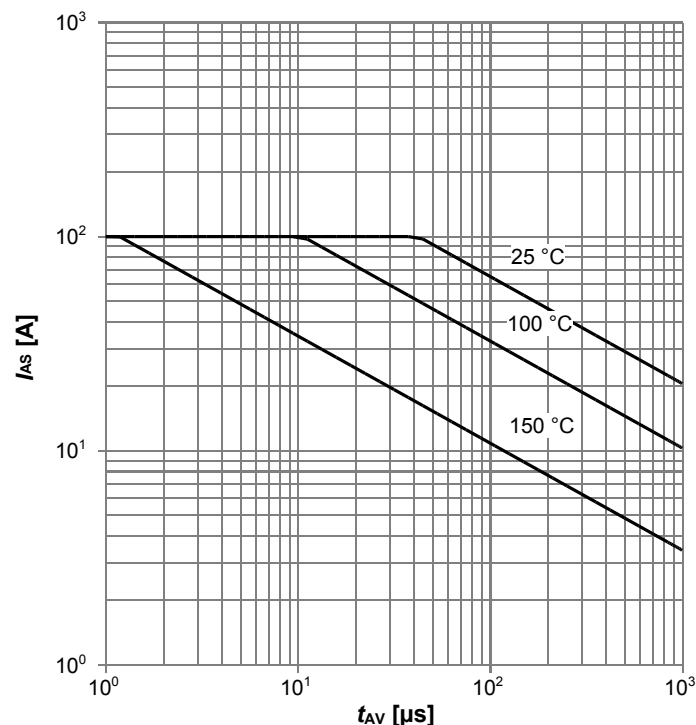


Diagram 14: Typ. gate charge

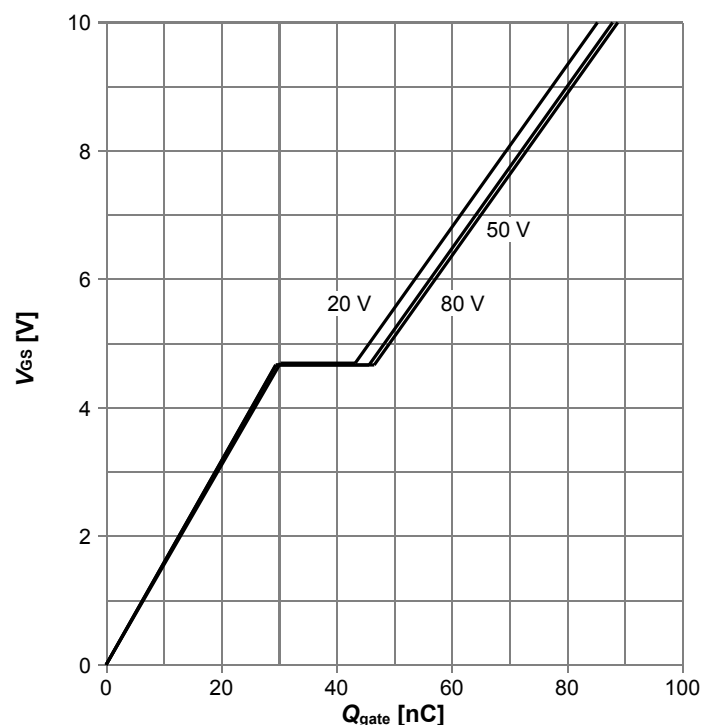
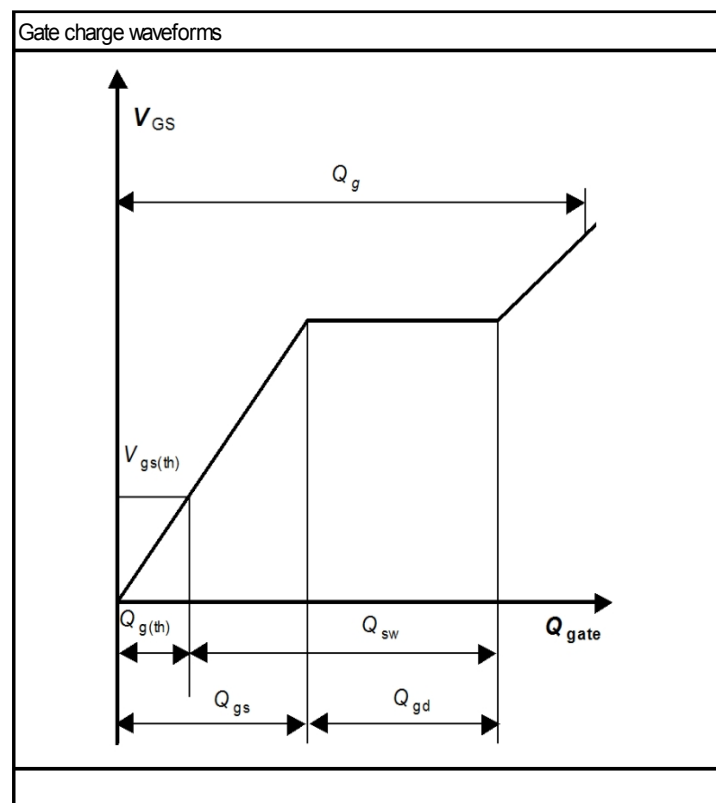
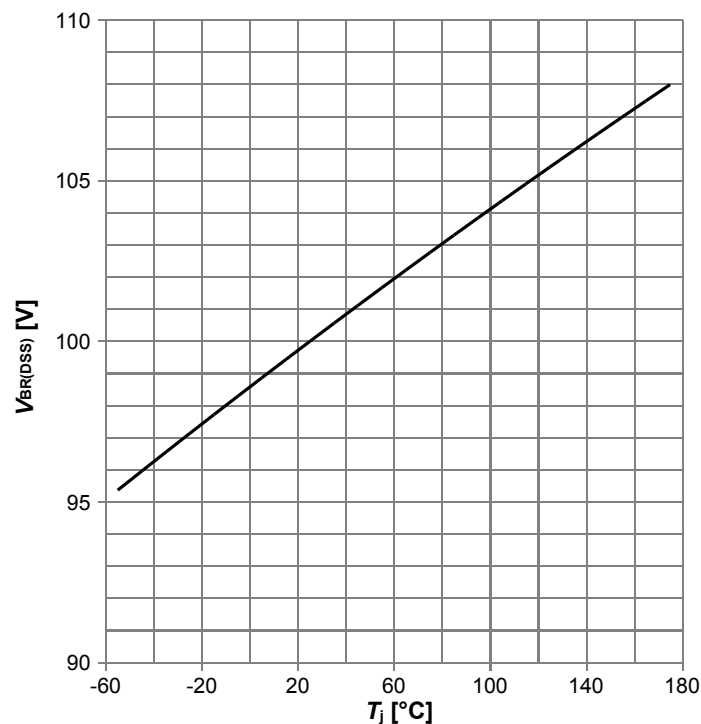


Diagram 15: Drain-source breakdown voltage





Package Outlines

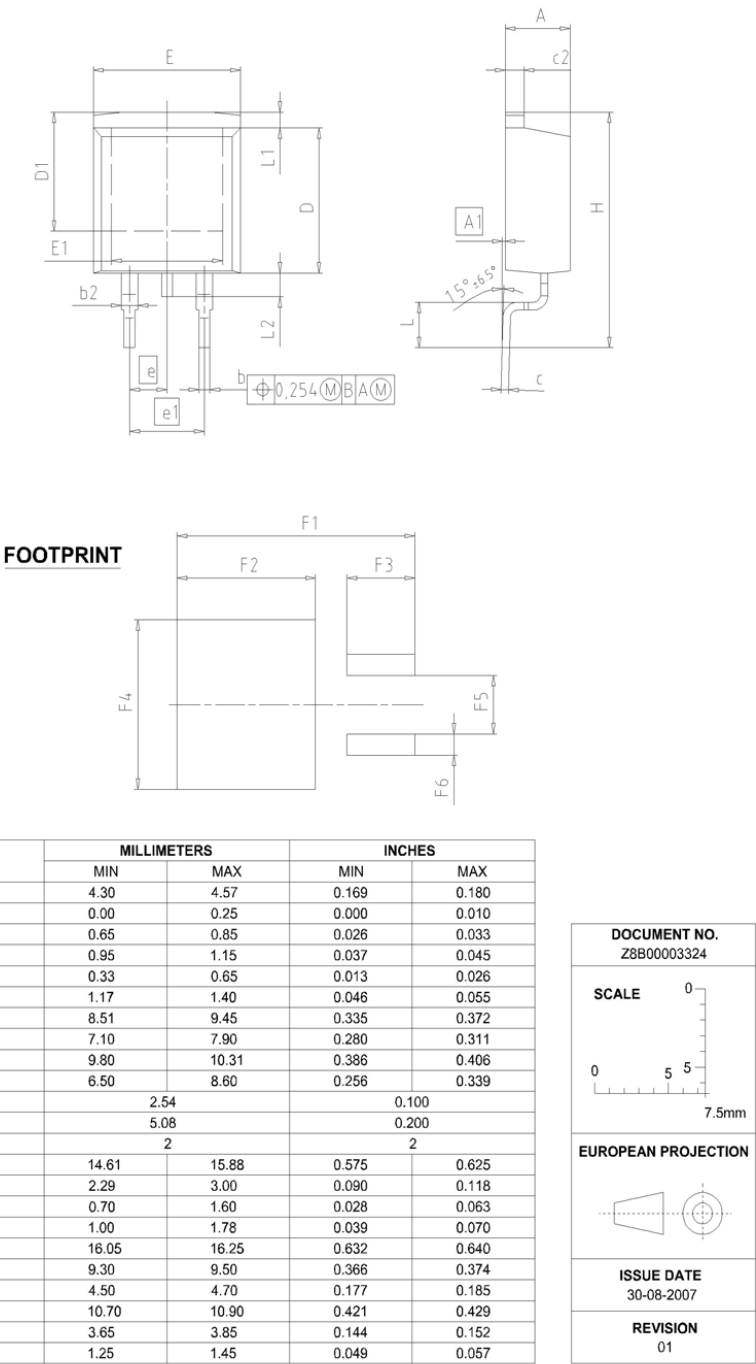


Figure 1 Outline PG-TO 263-3, dimensions in mm/inches