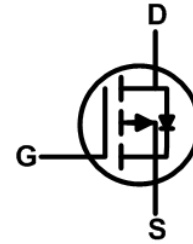




Features

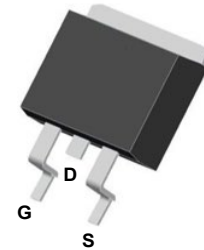
- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$



Applications

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

TO* Pin Configuration



Product Summary

BVDSS	RDSON	ID
-60V	9.0mΩ	-80A

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

Symbol	Parameter	Value	Units
V_{DSS}	Drain-to-Source Voltage	-60	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	-80
	Continuous Drain Current	$T_C = 100^\circ\text{C}$	-50
I_{DM}^{a1}	Pulsed Drain Current	-320	A
V_{GS}	Gate-to-Source Voltage	± 20	V
P_D	Power Dissipation	110	W
E_{AS}^{a2}	Single pulse avalanche energy	450	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	300	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.1	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	60	$^\circ\text{C}/\text{W}$



Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V _{DSS}	Drain to Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-60	--	--	V
I _{DSS}	Drain to Source Leakage Current	V _{DS} = -60V, V _{GS} = 0V	--	--	1	μA
I _{GSS(F)}	Gate to Source Forward Leakage	V _{GS} = -20V	--	--	100	nA
I _{GSS(R)}	Gate to Source Reverse Leakage	V _{GS} = +20V	--	--	-100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1.3	-1.8	-2.3	V
R _{DS(ON)1}	Drain-to-Source On-Resistance	V _{GS} =-10V, I _D =-20A	--	9.0	11.0	mΩ
R _{DS(ON)2}	Drain-to-Source On-Resistance	V _{GS} =-4.5V, I _D =-15A	--	12.0	16.0	mΩ
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-20A	50	--	--	S

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C _{iss}	Input Capacitance	V _{GS} =0V	--	3060	--	pF
C _{oss}	Output Capacitance	V _{DS} =-30V	--	620	--	
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	--	20	--	
R _g	Gate resistance	V _{GS} =0V, V _{DS} Open	--	2.0	--	Ω

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
t _{d(ON)}	Turn-on Delay Time	I _D =-20A, R _L =0.75Ω	--	4.5	--	ns
t _r	Rise Time	V _{DS} = -30V	--	2.5	--	
t _{d(OFF)}	Turn-Off Delay Time	V _{GS} = -10V	--	14.5	--	
t _f	Fall Time	R _G = 3Ω	--	3.5	--	
Q _g	Total Gate Charge	V _{GS} =-10V	--	56	--	nC
Q _{gs}	Gate Source Charge	V _{DS} =-30V	--	11	--	
Q _{gd}	Gate Drain Charge	I _D =-20A	--	9	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I _S	Diode Forward Current	T _C =25 °C	--	--	-80	A
I _{SM}	Diode Pulse Current		--	--	-320	A
V _{SD}	Diode Forward Voltage	I _S =-6.0A, V _{GS} =0V	--	--	-1.2	V
t _{rr}	Reverse Recovery time	I _S =-20A, V _{DD} =-30V dI/dt=100A/μs	--	60	--	ns
Q _{rr}	Reverse Recovery Charge		--	105	--	nC

a¹: Repetitive rating; pulse width limited by maximum junction temperature

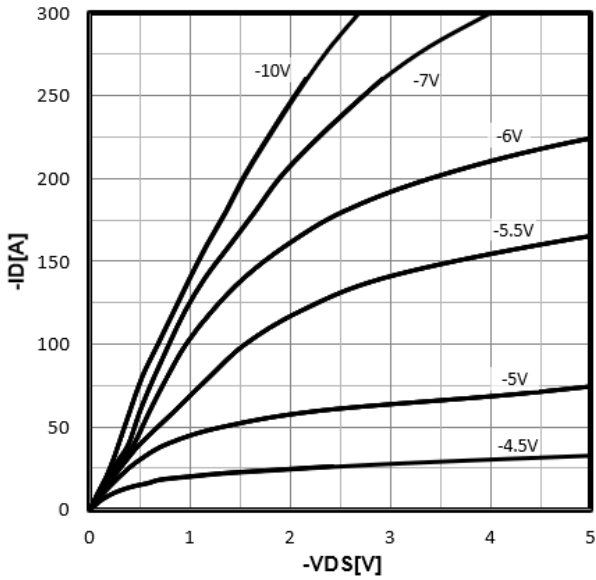
a²: V_{DD} =30V, L=0.3mH, R_G =25Ω, Starting T_j=25°C



Characteristics Curve:

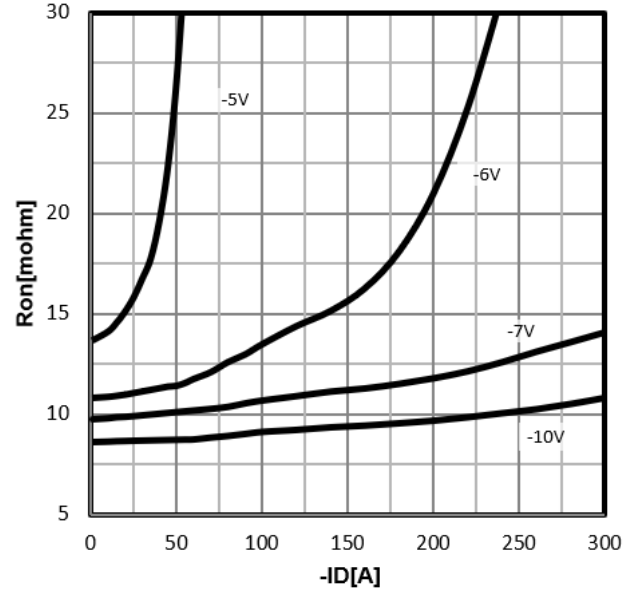
Typ. output characteristics

$$I_D = f(V_{DS})$$



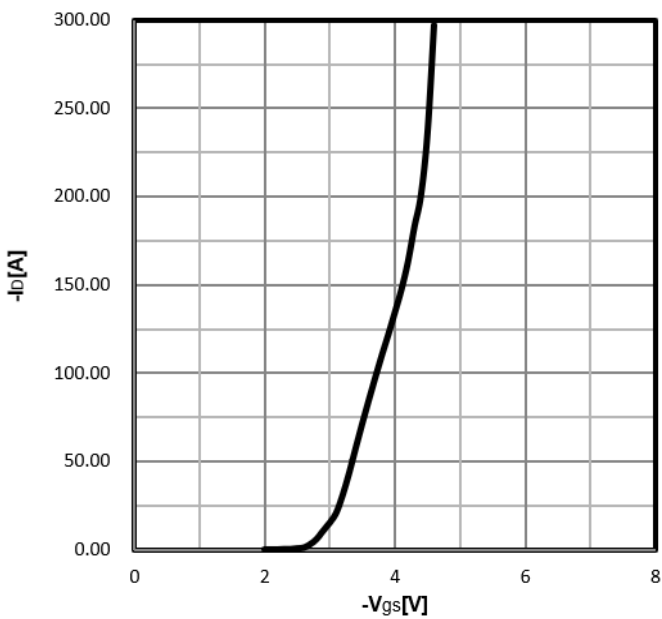
Typ. drain-source on resistance

$$R_{DS(on)} = f(I_D)$$



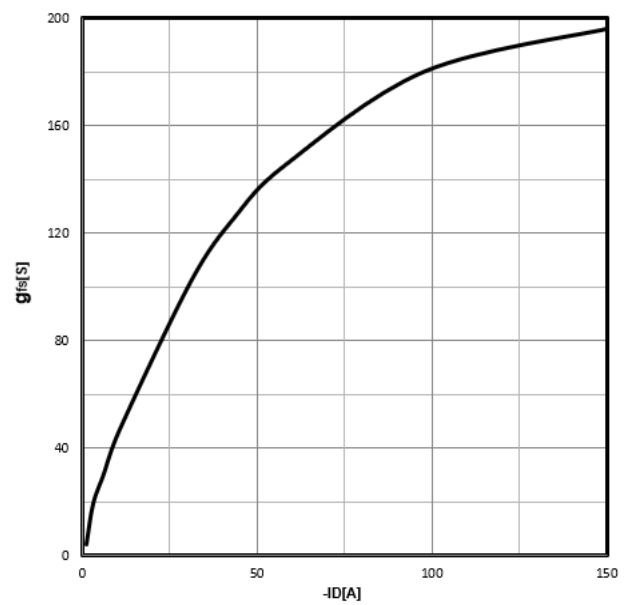
Typ. transfer characteristics

$$I_D = f(V_{GS})$$



Typ. forward transconductance

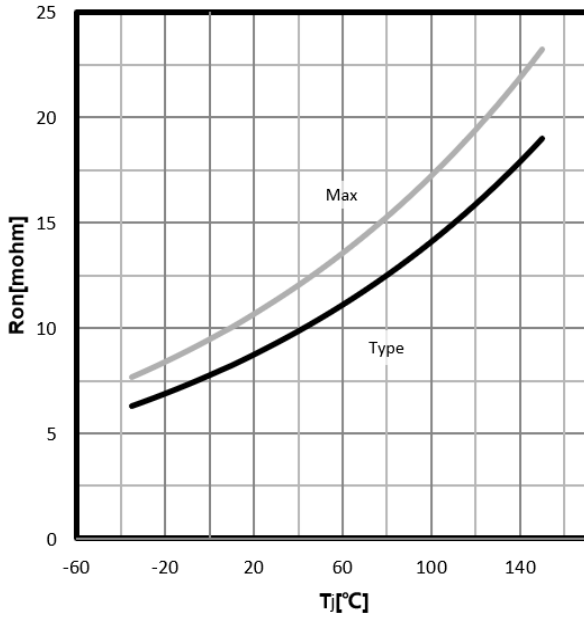
$$g_{fs} = f(I_D)$$





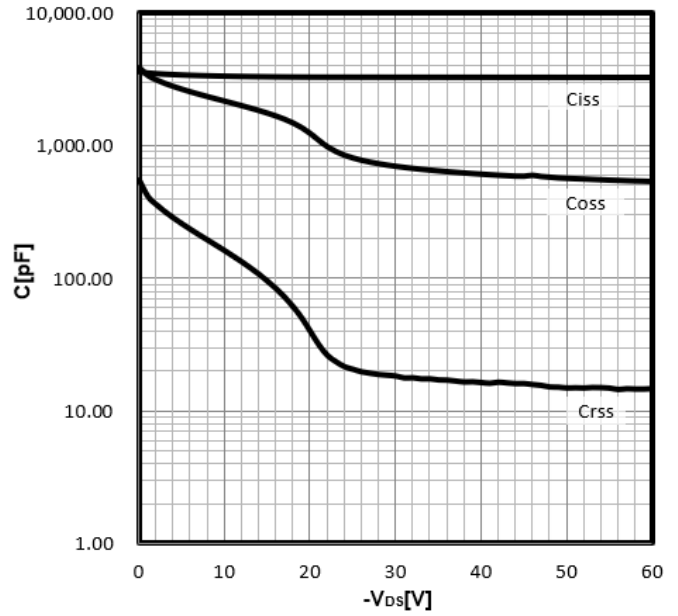
Drain-source on-state resistance

$$R_{DS(on)} = f(T_j); I_D = -20A; V_{GS} = -10V$$



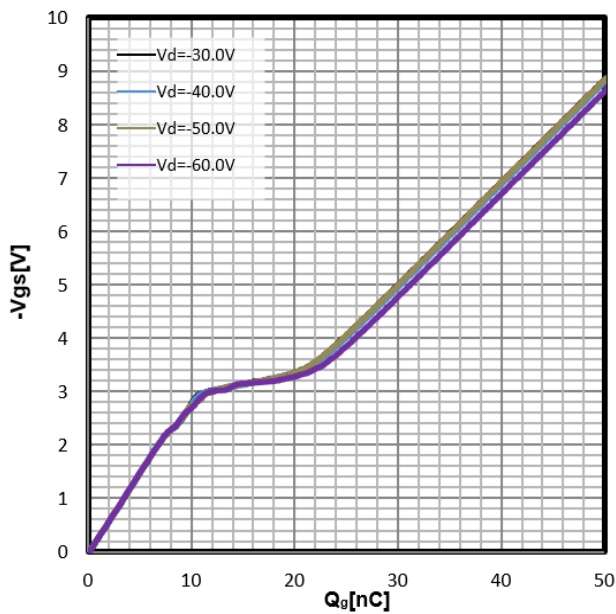
Typ. capacitances

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



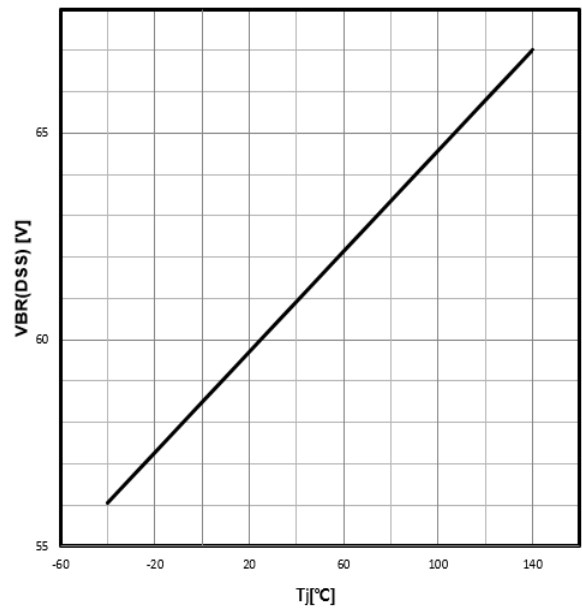
Typ. gate charge

$$V_{GS} = f(Q_{gate}); I_D = -20A$$



Drain-source breakdown voltage

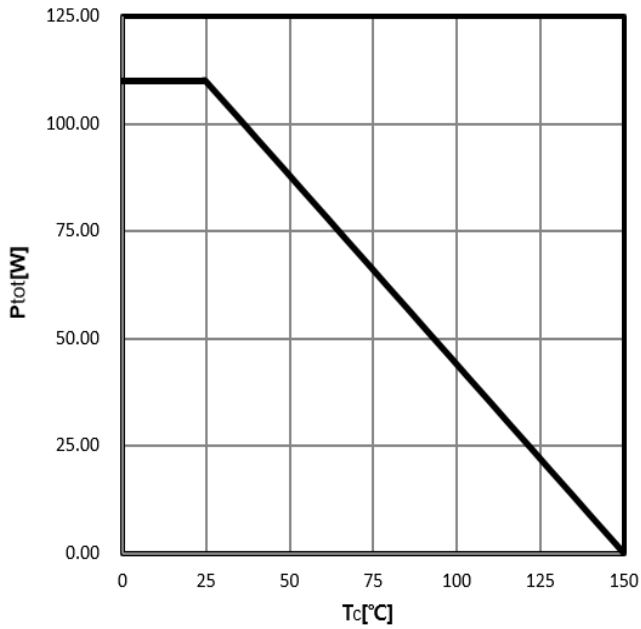
$$V_{BR(DSS)} = f(T_j); I_D = -250\mu A$$



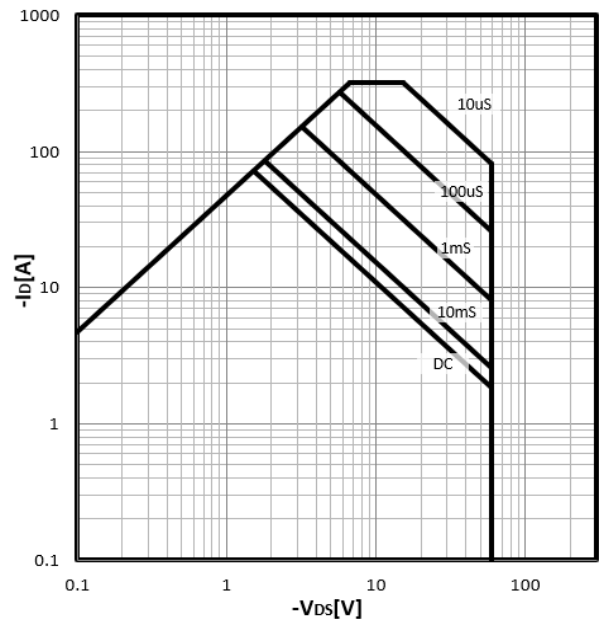


Power Dissipation

$$P_{tot}=f(T_C)$$

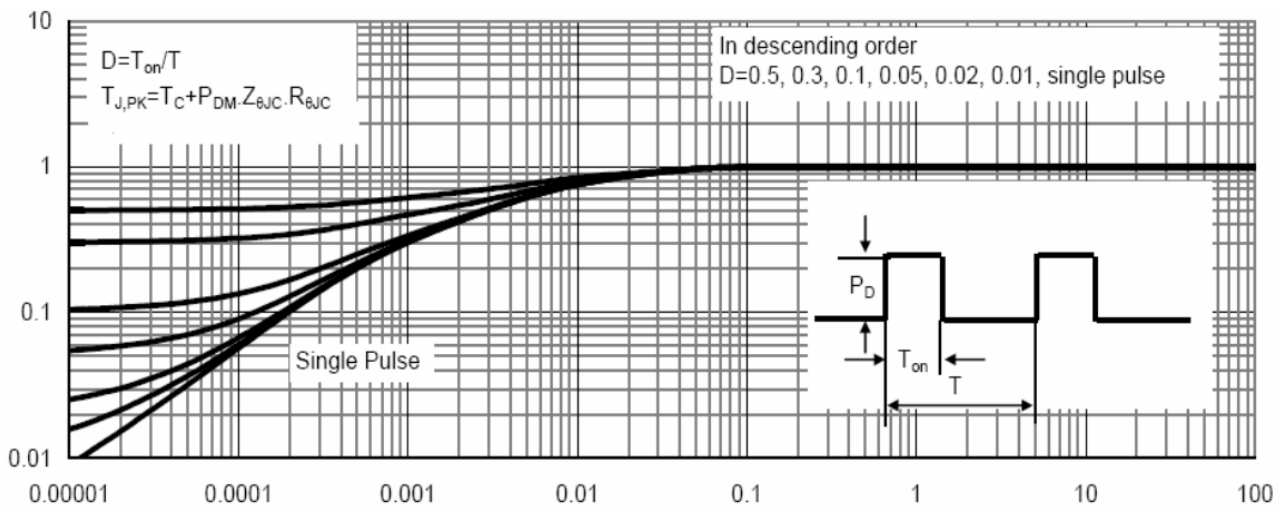


$$I_D=f(V_{DS})$$



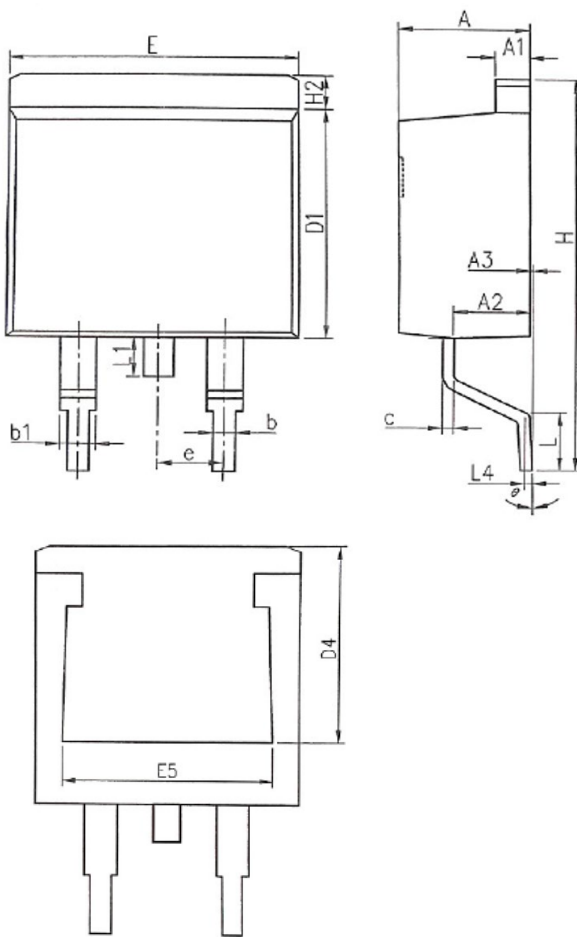
Max. transient thermal impedance

$$Z_{thJC}=f(t_p)$$





Mechanical Dimensions for TO-263



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	4.37	4.89
A1	1.17	1.42
A2	2.20	2.90
A3	0.00	0.25
b	0.70	0.96
b1	1.17	1.47
c	0.28	0.60
D1	8.45	9.30
D4	6.60	-
E	9.80	10.40
E5	7.06	-
e	2.54BSC	
H	14.70	15.70
H2	1.07	1.47
L	2.00	2.80
L1	-	1.75
L4	0.254BSC	
θ	0°	9°



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