

Features

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

Applications

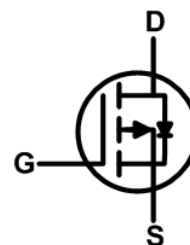
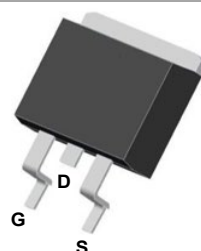
- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

Product Summary



BVDSS	RDSON	ID
-60V	9.0mΩ	-80A

TO263Pin Configuration

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	A
	Continuous Drain Current	$T_C = 100^\circ\text{C}$	-50	A
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	$V_{GS}=0V, I_D=-250\mu A$	-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	$V_{DS}=V_{GS}, I_D=-250\mu A$	-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	m Ω
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	$V_{GS}=-4.5V, I_D=-15A$	--	12.0	16.0	m Ω
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	$I_D=-20A, R_L=0.75\Omega$	--	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	$R_G= 3\Omega$	--	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	$T_C=25^\circ C$	--	--	-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	$I_S=-20A, V_{DD}=-30V$	--	60	--	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=100A/\mu s$	--	105	--	nC

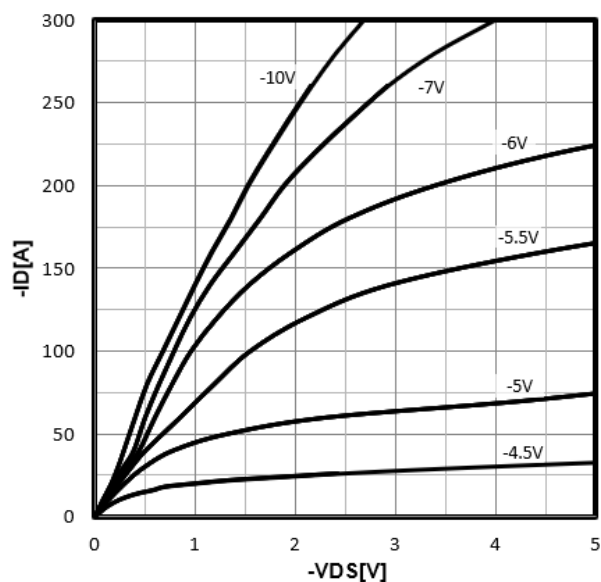
a1: Repetitive rating; pulse width limited by maximum junction temperature

a2: $V_{DD} = 30V, L=0.3mH, R_G = 25\Omega$, Starting $T_j=25^\circ C$

Characteristics Curve:

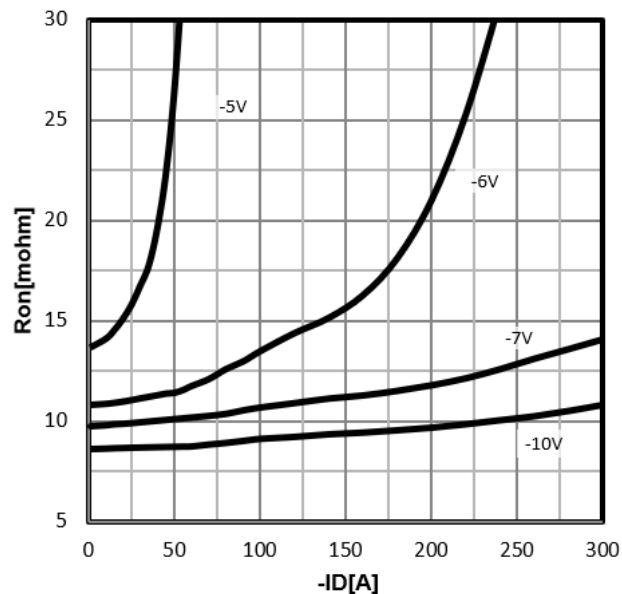
Typ. output characteristics

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



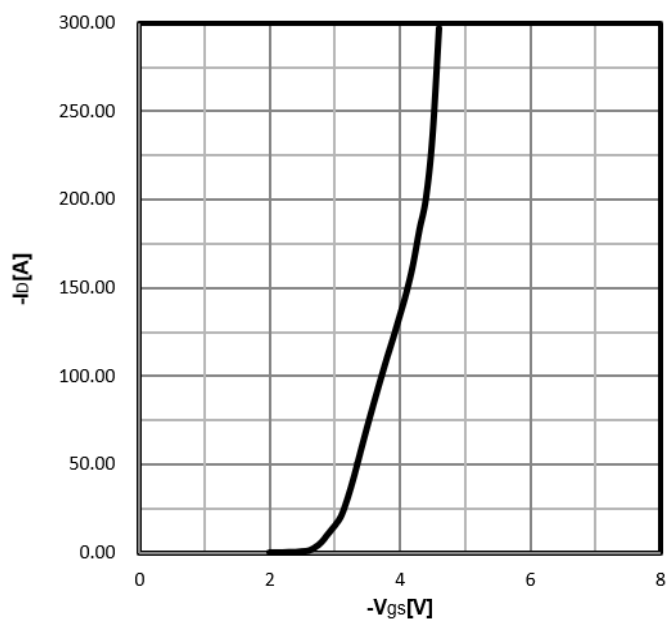
Typ. drain-source on resistance

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



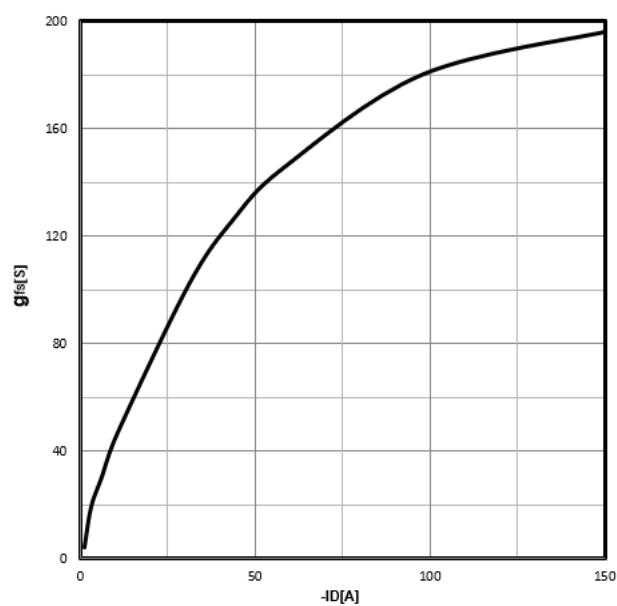
Typ. transfer characteristics

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



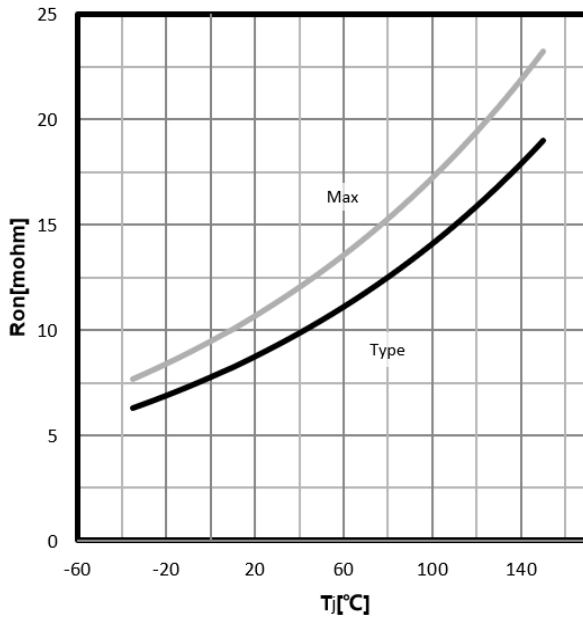
Typ. forward transconductance

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



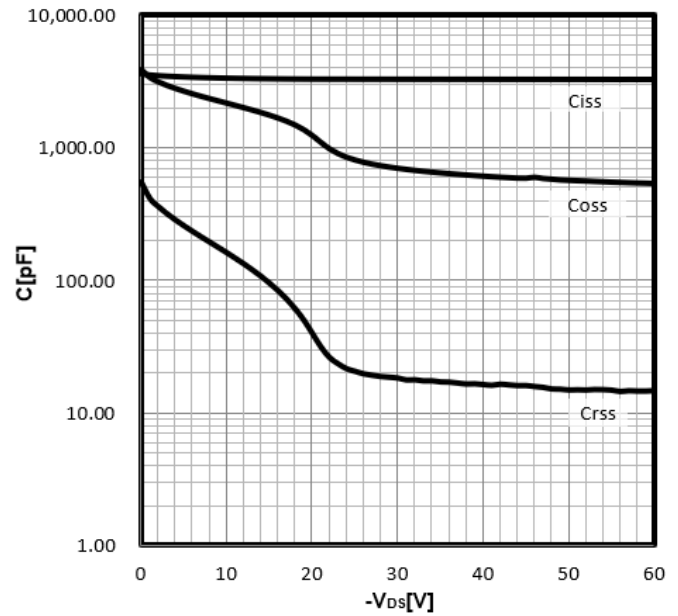
Drain-source on-state resistance

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



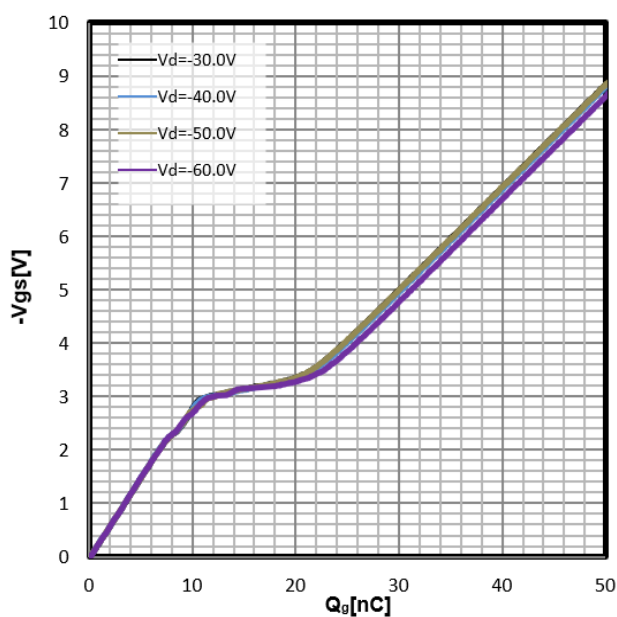
Typ. capacitances

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



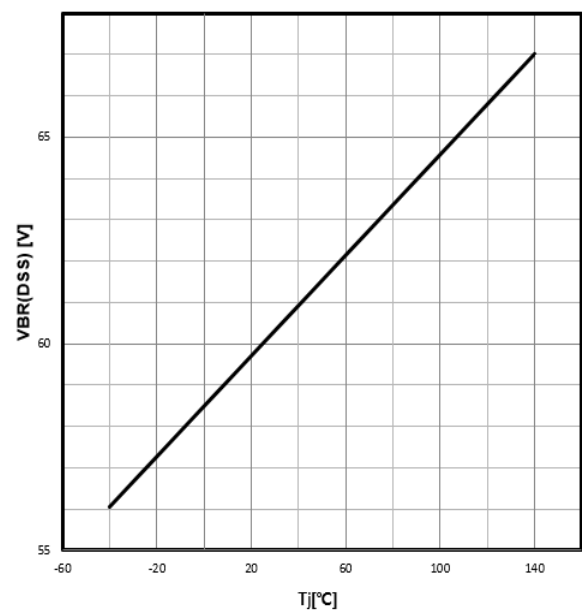
Typ. gate charge

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



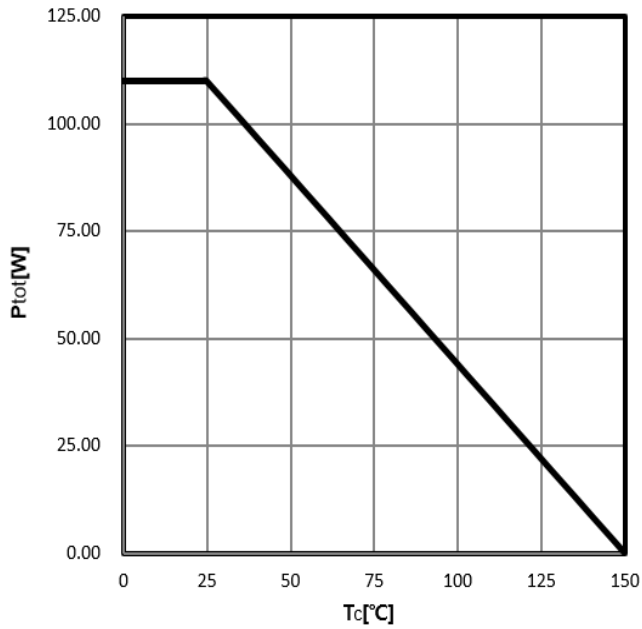
Drain-source breakdown voltage

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

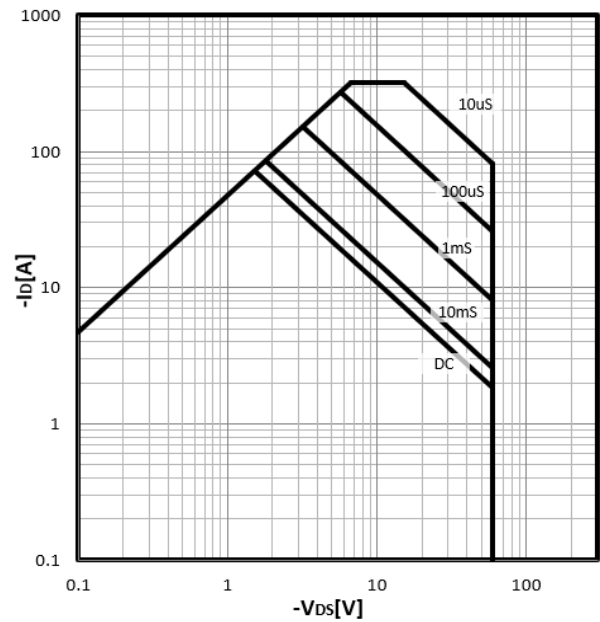


Power Dissipation

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

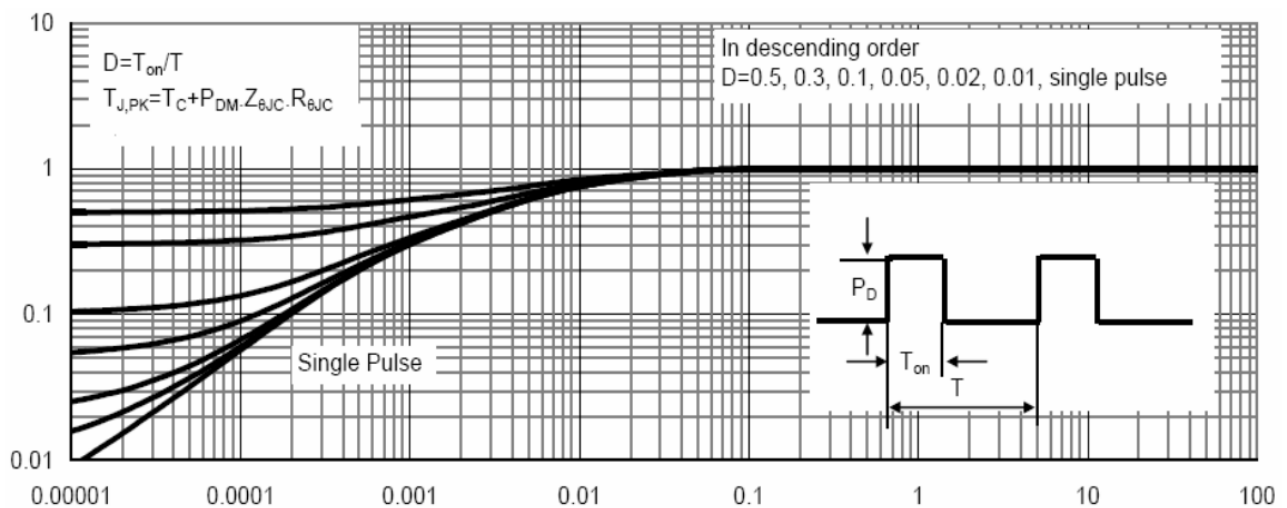


$$I_D=f(V_{DS})$$

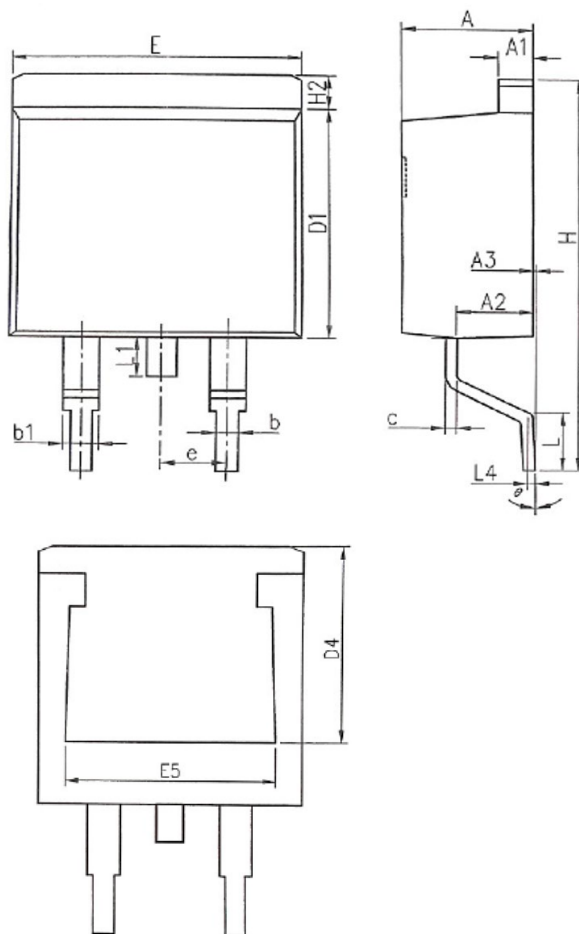


Max. transient thermal impedance

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



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°