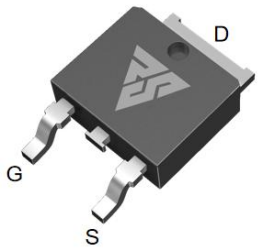
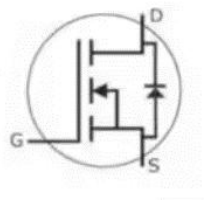
V_{DS}	$R_{DS(on)Typ}$	I_D@25℃
800V	360mΩ	7A





RoHS REACH HF

Applications:

- LED driver
- PD charger
- PC adapter
- Air-conditioning

Features:

- Revolutionary semiconductor material Silicon Carbide
- High blocking voltage with low on-resistance
- High-speed switching with very low switching losses
- High-speed and high robust intrinsic body diode

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RSM080360BD	TO-252	RSM080360BD	Tape&reel	2500 PCS

Maximum Ratings (TJ= 25℃ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions
V_{DS}	Drain - Source Voltage	800	V	V_{GS}=0V,I_D=250μA
V_{GS}	Gate - Source Voltage	-10/+22	V	Absolute maximum values
V_{GSOP}	Recommended Operation Voltage of Gate to Source	0/+18	V	Recommended operational values
I_D	Continuous Drain Current	7 5.7	A	T_C =25℃ T_C =100℃
I_{DM}	Pulsed Drain Current	12	A	T_C =25℃
E_{AS}	Single Pulse Avalanche Energy L=0.5mH,I_{AS}=6.4A,V_{DD}=50V,V_{GS}=15 V	10.2	mJ	
P_D	Power Dissipation	39	W	T_C =25℃
T_J, T_{stg}	Operating Junction and StorageTemperature	-55 to + 175	℃	
T_{sold}	Soldering Temperature, Wave Soldering only Allowed at Leads 1.6mm from Case for 10s	260	℃	

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Electrical Characteristics (TJ= 25℃ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	800			V	V_{GS}=0V,I_D=250μA	
$V_{GS(th)}$	Gate Threshold Voltage	3.0	3.8		V	V_{GS}= V_{DS}, I_D=3.5mA	
I_{DSS}	Zero Gate Voltage Drain Current	1		50	μA	V_{DS}=800V, V_{GS}=0V	
I_{GSS}	Gate-Source Leakage Current			250	nA	V_{GS}=22V, V_{DS}=0V	
$R_{DS(on)}$	Drain-Source on-state Resistance		500	650	mΩ	V_{GS}=15V, I_D =4A	
			360	480		V_{GS}=18V, I_D =4A	
C_{iss}	Input Capacitance		153		pF	V_{GS}=0V, V_{DS}=400V f=1MHz,T_j=25℃	
C_{oss}	Output Capacitance		29				
C_{rss}	Reverse Transfer Capacitance		1.3				
gfs	Transconductance		2.6		S	V_{DS}=20V,I_D=4A	
R_G	Internal Gate Resistance		35		Ω	f=1MHz,V_{AC}=25mV	
Q_g	Total Gate Charge		6.7		nC	V_{DS}=400V V_{GS}=0/+15V I_D=4A	
Q_{gs}	Gate to Source Charge		3.0				
Q_{gd}	Gate to Drain Charge		1.1				
$t_{d(on)}$	Turn-On Delay Time		16.1 15.4		ns	V_{DD}=400V V_{GS} =0/15V L=600μH I_D=4A $R_{G(on)}$=10Ω $R_{Goff)}$=10Ω	T_j=25℃ T_j=175℃
t_r	Rise Time		13.9 18.3				T_j=25℃ T_j=175℃
$t_{d(off)}$	Turn-Off Delay Time		13.3 15.5				T_j=25℃ T_j=175℃
t_f	Fall Time		13.7 13.5				T_j=25℃ T_j=175℃
Eon	Turn−On Switching Loss		41.2 39.8		μJ		T_j=25℃ T_j=175℃
Eoff	Turn−Off Switching Loss		3.08 2.97				T_j=25℃ T_j=175℃
Etot	Total Switching Energy		44.28 42.77				T_j=25℃ T_j=175℃

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Reverse Diode Characteristics (TJ= 25℃ unless otherwise specified)

Symbol	Parameter	Typ.	Max	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	3.8 3.3		V	V_{GS}=0V, I_{SD} =2A	T_j=25℃ T_j=175℃
I_S	Continuous DC Source Current, Limited by $T_{VJ(max)}$	6 4		A	T_C=25℃ T_C=100℃	
I_{SM}	Peak Reverse Drain Current, tp Limited by $T_{VJ(max)}$	12		A	T_C=25℃	
I_{rrm}	Peak Reverse Recovery Current	4.2 4.4		A	V_{DS}=400V V_{GS}=0V I_{SD}=4A di/dt=1.1KA/us	T_j=25℃ T_j=175℃
Q_{rr}	Reverse Recovery Charge	20 23		nC		T_j=25℃ T_j=175℃
t_{rr}	Reverse Recovery time	7.9 9.0		ns		T_j=25℃ T_j=175℃
Err	Reverse Recovery Energy	0.19 0.28		μJ		T_j=25℃ T_j=175℃

Thermal Characteristics (TJ= 25℃ unless otherwise specified)

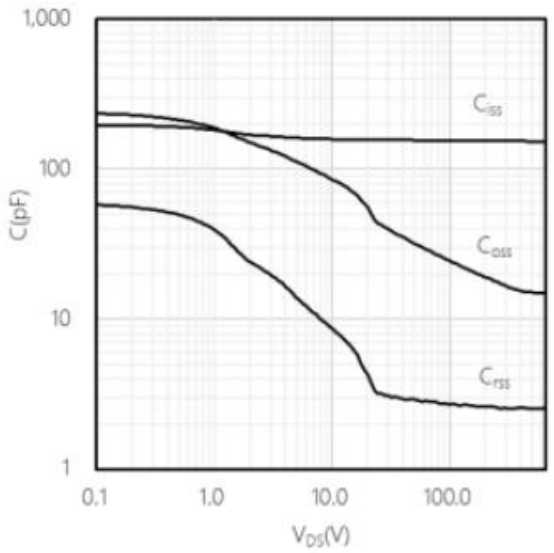
Symbol	Parameter	Typ.	Max.	Unit	Test Conditions
$R_{\theta JC}$	Thermal Resistance from Junction to Case	3.85		℃/W	

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Typical Feature Curve

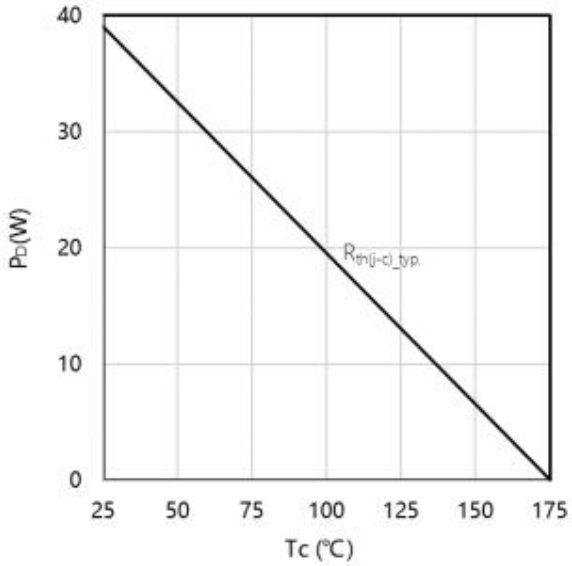
Typical capacitance as a function of drain-source voltage

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



Power dissipation as a function of case temperature limited by bond wire

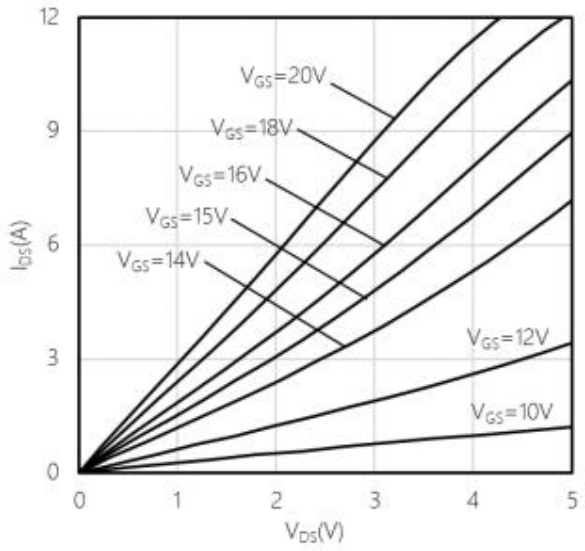
$P_D = f(T_c)$



Typical output characteristic, V_{GS} as parameter

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

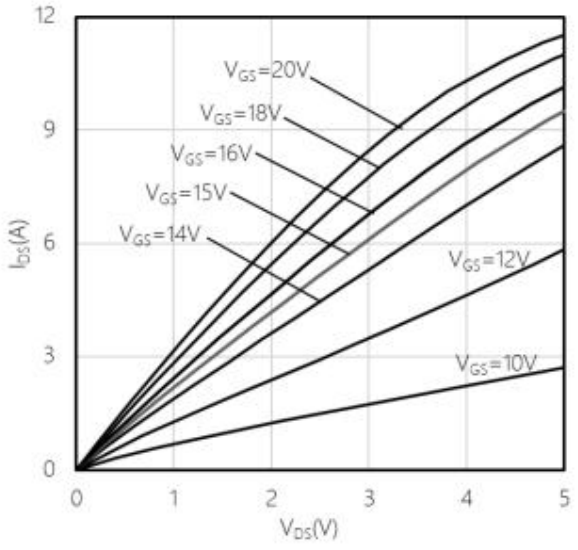
T_{VJ} = -55 ℃



Typical output characteristic, V_{GS} as parameter

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

T_{VJ} = 25 ℃

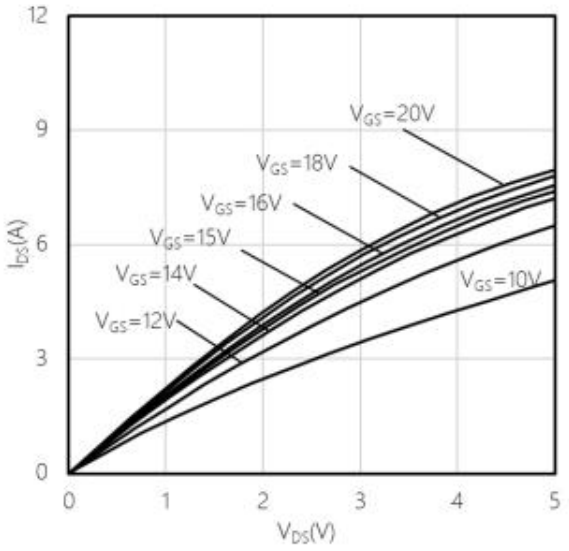


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Typical output characteristic, V_{GS} as parameter

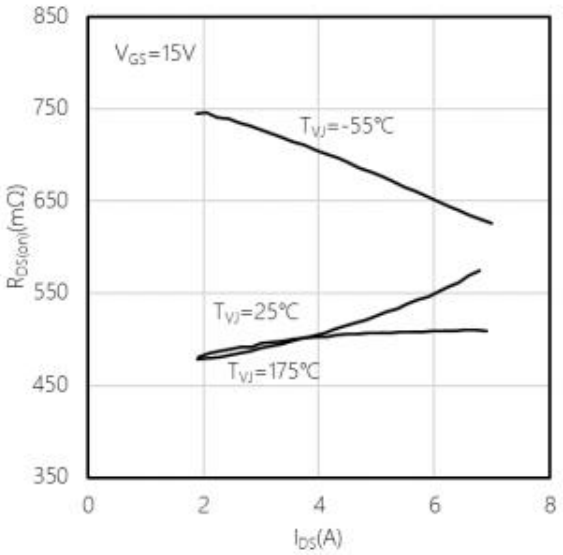
$I_{DS} = f(V_{DS})$

$T_{VJ} = 175℃$



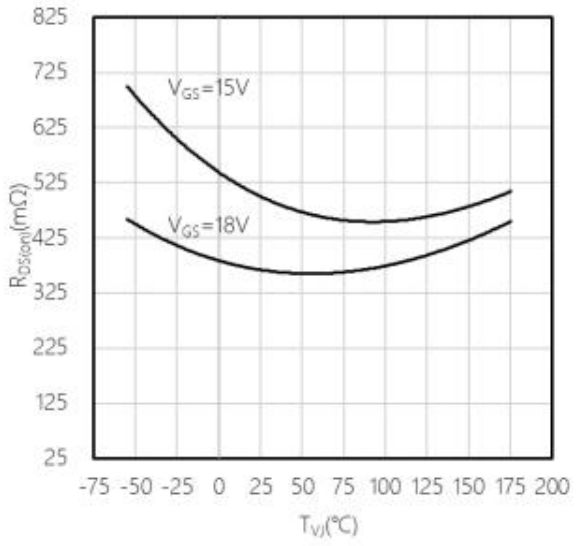
Typical on-state resistance as a function of drain current

$R_{DS(on)} = f(I_{DS})$, $V_{GS} = 15V$



Typical on-state resistance as a function of temperature

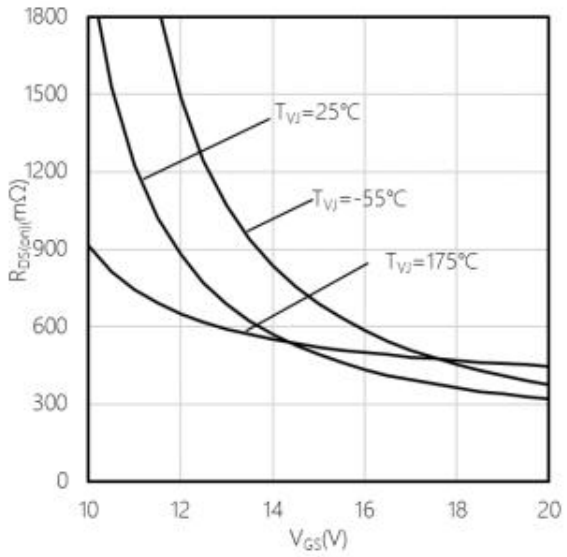
$R_{DS(on)} = f(T_{VJ})$, $I_{DS} = 4$ A



Typical on-state resistance as a function of V_{GS}

$R_{DS(on)} = f(V_{GS})$

$I_{DS} = 4$ A

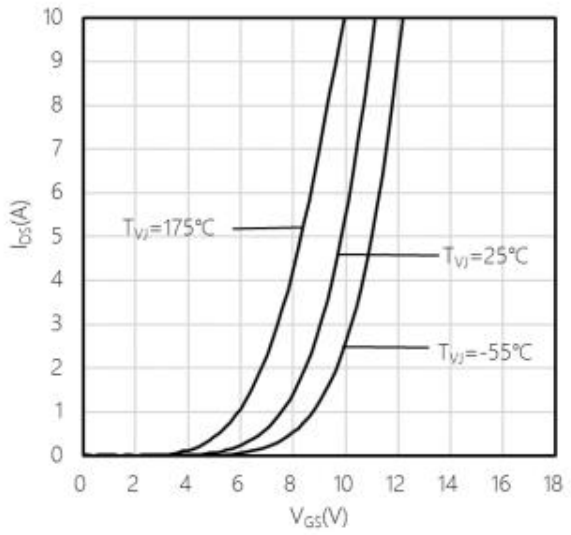


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Typical transfer characteristic

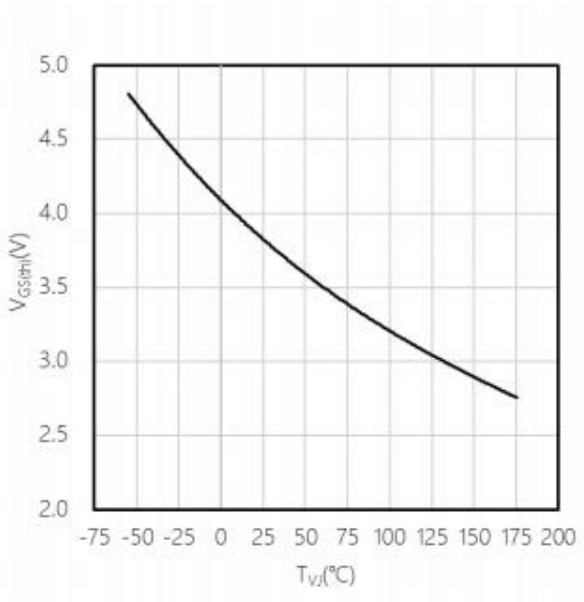
$I_{DS} = f(V_{GS})$

V_{DS}= 20 V



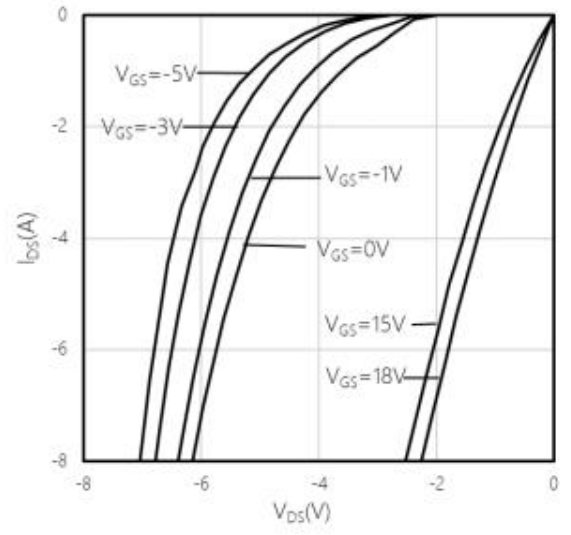
Typical gate-source threshold voltage as a function of junction temperature

$V_{GS(th)} = f(T_{VJ})$, I_{DS} = 3.5 mA



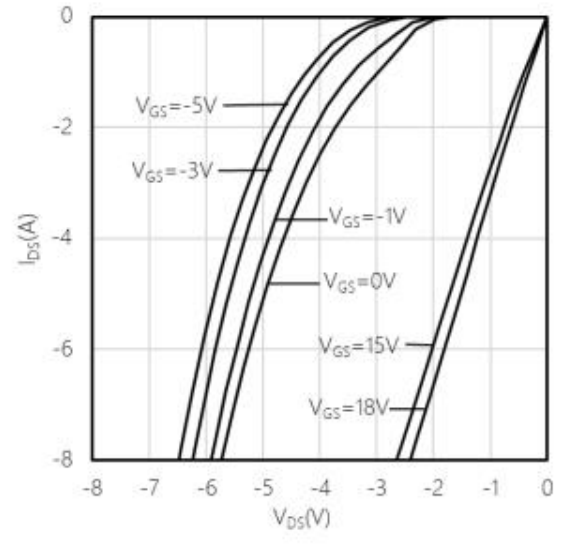
Typical reverse drain current as function of reverse drain voltage, V_{GS} as parameter

$I_{DS} = f(V_{DS})$, T_{VJ} = -55 °C



Typical reverse drain current as function of reverse drain voltage, V_{GS} as parameter

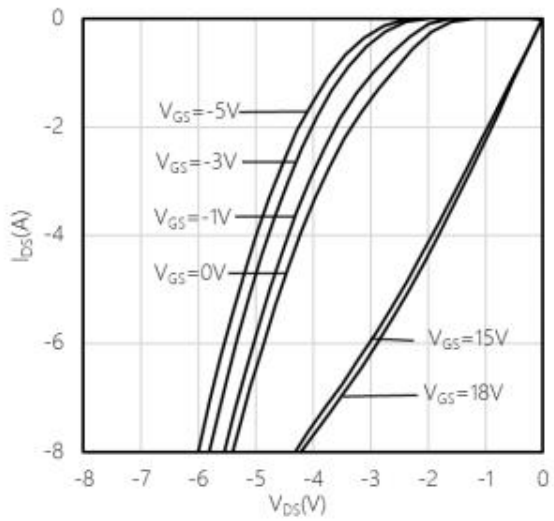
$I_{DS} = f(V_{DS})$, T_{VJ} = 25 °C



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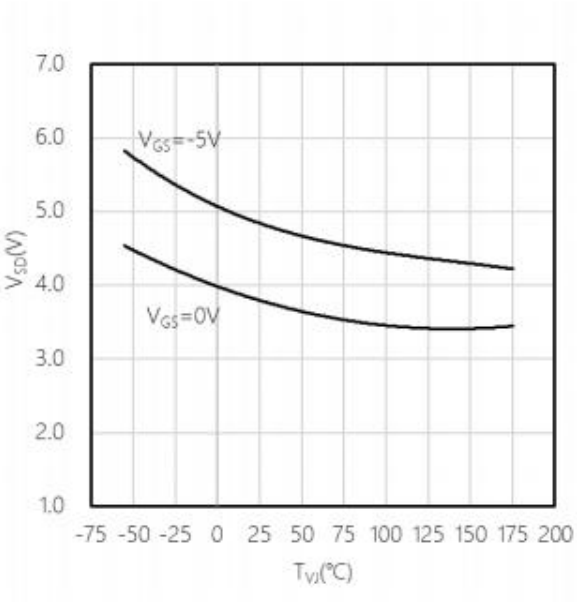
Typical reverse drain current as function of reverse drain voltage, V_{GS} as parameter

$I_{DS} = f(V_{DS})$, T_{VJ} = 175 °C



Typical reverse drain voltage as function of junction temperature

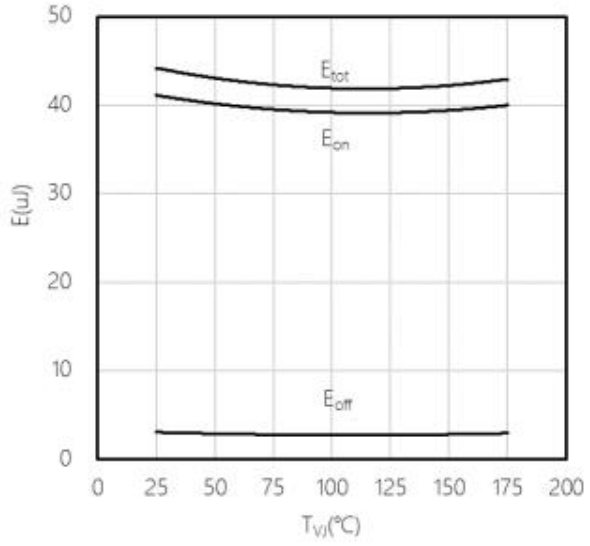
$V_{SD} = f(T_{VJ})$, I_{SD} = 2 A



Typical switching energy as a function of junction temperature, 2nd device own body diode: V_{GS} = 0 V

$E = f(T_{VJ})$

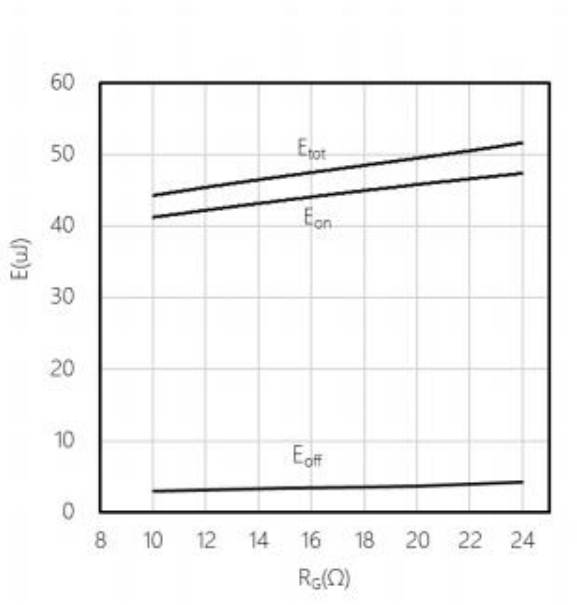
V_{DS} = 400 V, $R_{G(ext)}$ = 10 Ω, V_{GS} = 0V / 15 V, I_{DS} = 4 A



Typical switching energy losses as a function of gate resistance, 2nd device own body diode: V_{GS} = 0 V

$E = f(R_{G(ext)})$

V_{GS} = 0/15 V, I_{DS} = 4 A, T_{VJ} = 25 °C, V_{DS} = 400 V

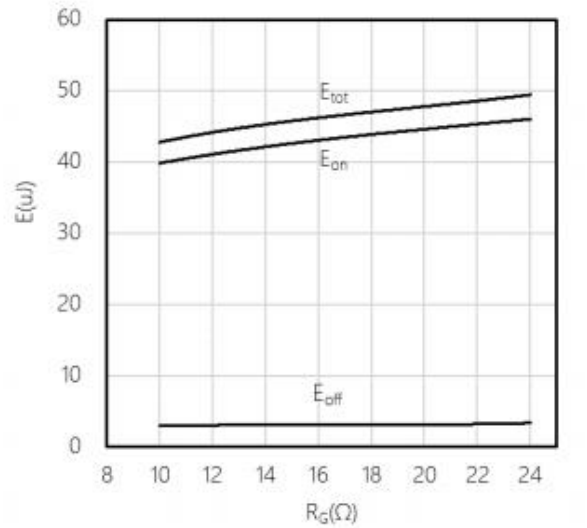


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Typical switching energy losses as a function of gate resistance, 2nd device own body diode: V_{GS} = 0 V

$E = f(R_{G(ext)})$

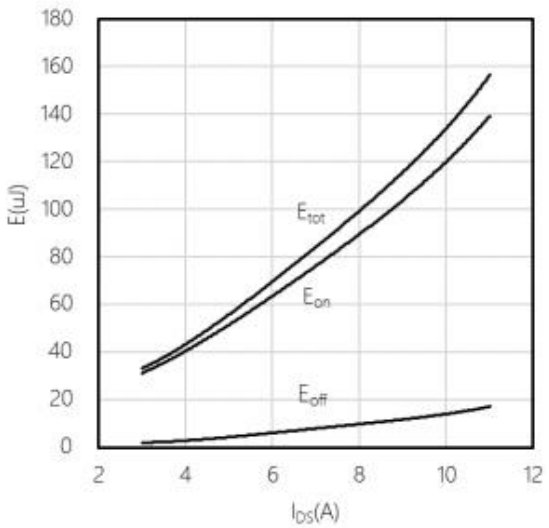
V_{GS} = 0/15 V, I_{DS} = 4 A, T_{VJ} = 175 °C, V_{DS} = 400 V



Typical switching energy losses as a function of I_{DS}, 2nd device own body diode: V_{GS} = 0 V

$E = f(I_{DS})$

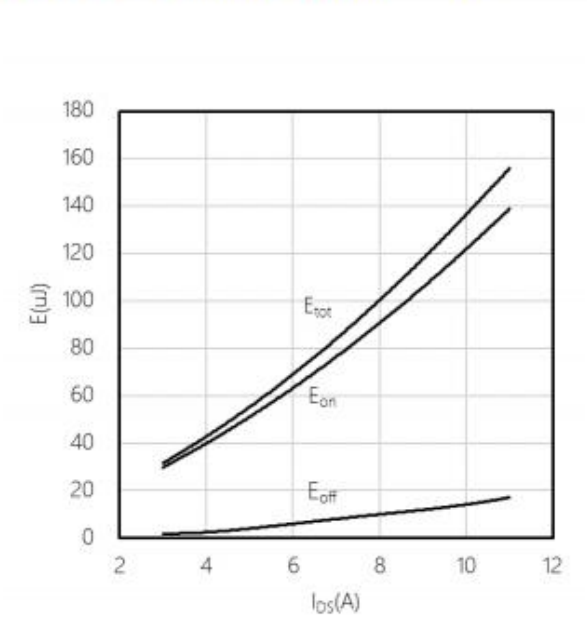
V_{GS} = 0/15 V, $R_{G(ext)}$ = 10 Ω, T_{VJ} = 25 °C, V_{DS} = 400 V



Typical switching energy losses as a function of I_{DS}, 2nd device own body diode: V_{GS} = 0 V

$E = f(I_{DS})$

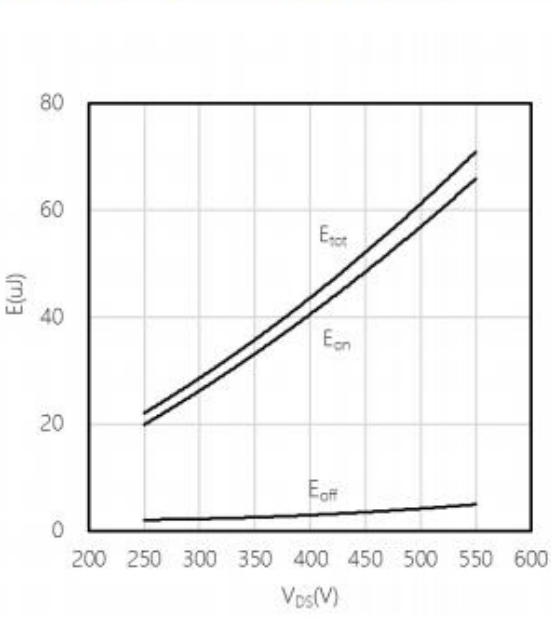
V_{GS} = 0/15 V, $R_{G(ext)}$ = 10 Ω, T_{VJ} = 175 °C, V_{DS} = 400 V



Typical switching energy losses as a function of V_{DS}, 2nd device own body diode: V_{GS} = 0 V

$E = f(V_{DS})$

V_{GS} = 0/15 V, $R_{G(ext)}$ = 10 Ω, T_{VJ} = 25 °C, I_{DS} = 4 A

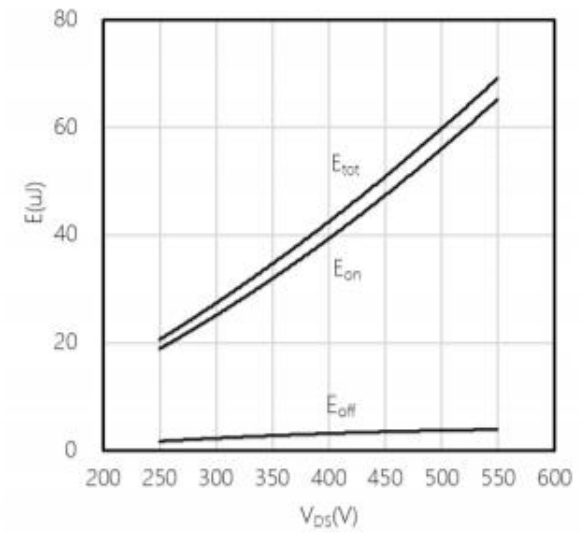


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Typical switching energy losses as a function of V_{DS}, 2nd device own body diode: V_{GS} = 0 V

$E = f(V_{DS})$

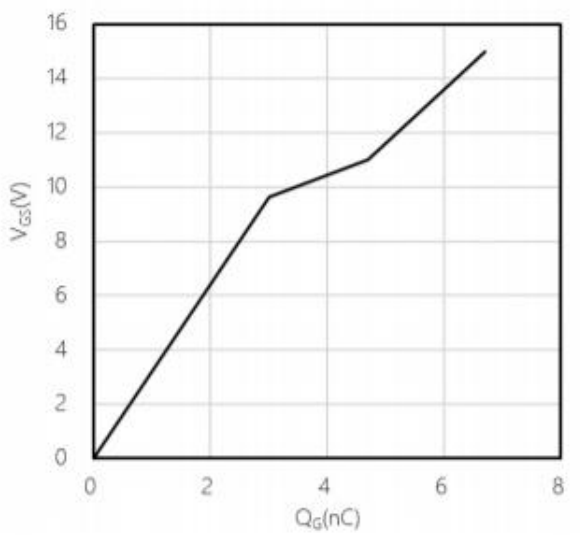
V_{GS} = 0/15 V, $R_{G(ext)}$ = 10 Ω, T_{VJ} = 175 °C, I_{DS} = 4 A



Typical gate charge

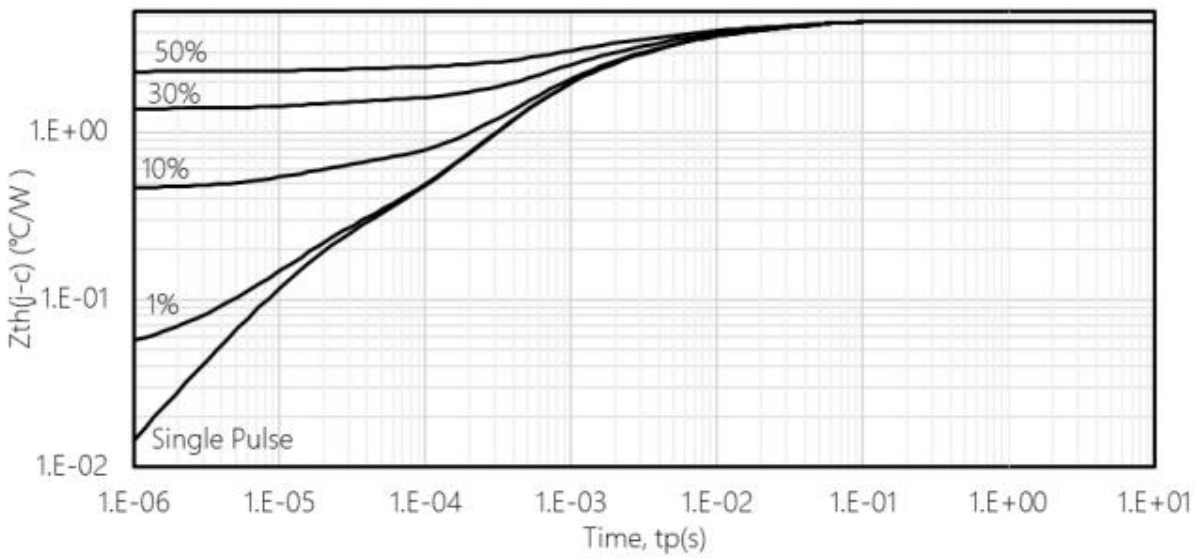
$V_{GS} = f(Q_G)$, I_{DS} = 4 A, V_{DS} = 400V

turn-on pulse



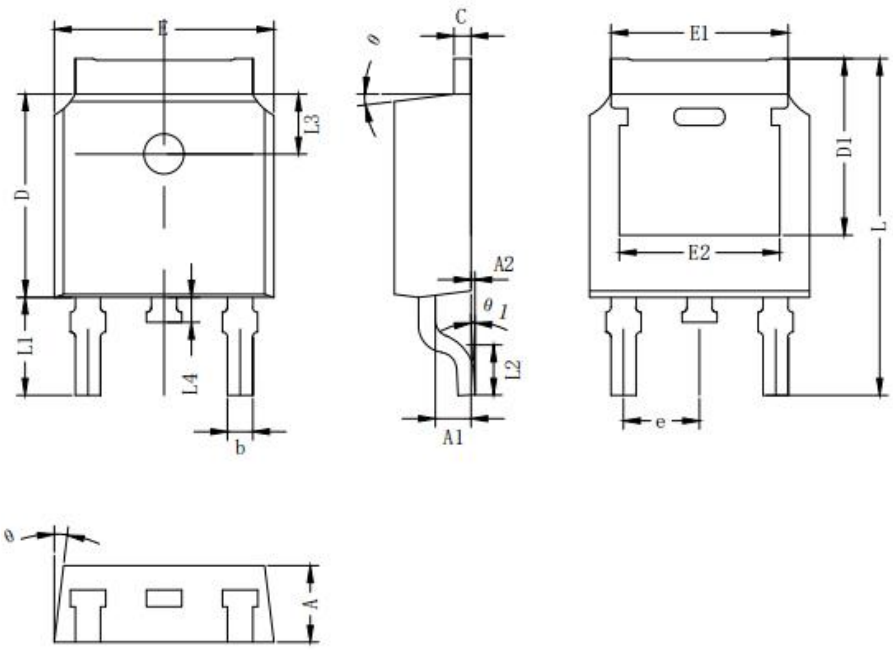
Transient thermal resistance (MOSFET)

$(Z_{th(j-c,max)} = f(t_p)$, Parameter $D = t_p/T$



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Package outline drawing(TO-252Unit: mm)



SYMBOL	MIN	NOM	MAX
A	2.10	2.30	2.50
A1	0.97	1.07	1.17
A2	0.00	–	0.12
b	0.66	0.76	0.86
c	0.45	0.51	0.60
D	5.90	6.10	6.30
D1	5.10	5.30	5.45
E	6.40	6.60	6.80
E1	5.10	5.33	5.45
E2	4.63	4.83	5.03
L	9.90	10.10	10.30
L1	2.74	2.94	3.14
L2	1.40	1.50	1.70
L3	1.65	1.80	1.95
L4	0.60	0.80	1.00
e	2.286BSC		
θ	5°	7°	10°
θ1	0°	–	3°

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2.A critical component is any component of a life support device or system whose failure to system whose failure to perform can be reasonably expected to cause the failure of the life support device or system,or to affect its safety or effectiveness.

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