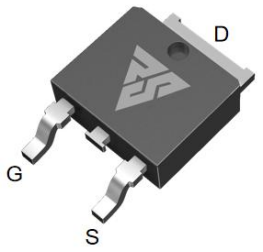
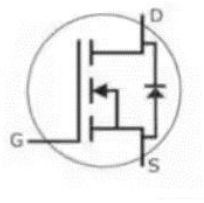
V_{DS}	$R_{DS(on)Typ}$	I_D@25℃
800V	300mΩ	8.8A





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.
RSM080300BD	TO-252	RSM080300BD	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	8.8 6.8	A	T_C =25℃ T_C =100℃
I_{DM}	Pulsed Drain Current	14	A	T_C =25℃
E_{AS}	Single Pulse Avalanche Energy L=0.5mH,I_{AS}=7.3A,V_{DD}=50V,V_{GS}=15 V	13.3	mJ	
P_D	Power Dissipation	45	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	℃	

preliminary

Copyright Reasunos

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	2.9	3.8		V	V_{GS}= V_{DS}, I_D=3.5mA	
I_{DSS}	Zero Gate Voltage Drain Current			20	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		430	560	mΩ	V_{GS}=15V, I_D =4.5A	
			300	400		V_{GS}=18V, I_D =4.5A	
C_{iss}	Input Capacitance		172		pF	V_{GS}=0V, V_{DS}=400V f=1MHz,T_j=25℃	
C_{oss}	Output Capacitance		13				
C_{rss}	Reverse Transfer Capacitance		1.3				
gfs	Transconductance		2.9		S	V_{DS}=20V,I_D=4.5A	
R_G	Internal Gate Resistance		25		Ω	f=1MHz,V_{AC}=25mV	
Q_g	Total Gate Charge		9.0		nC	V_{DS}=400V V_{GS}=0/+15V I_D=4.5A	
Q_{gs}	Gate to Source Charge		3.2				
Q_{gd}	Gate to Drain Charge		1.3				
$t_{d(on)}$	Turn-On Delay Time		17 14.3		ns	V_{DD}=400V V_{GS} =0/15V L=600μH I_D=4.5A $R_{G(on)}$=9.1Ω $R_{Goff)}$=9.1Ω	T_j=25℃ T_j=175℃
t_r	Rise Time		12.2 9.3				T_j=25℃ T_j=175℃
$t_{d(off)}$	Turn-Off Delay Time		14.5 16.8				T_j=25℃ T_j=175℃
t_f	Fall Time		13.1 13.0				T_j=25℃ T_j=175℃
Eon	Turn−On Switching Loss		45.4 42.2		μJ		T_j=25℃ T_j=175℃
Eoff	Turn−Off Switching Loss		3.86 3.40				T_j=25℃ T_j=175℃
Etot	Total Switching Energy		49.2 45.6				T_j=25℃ T_j=175℃

preliminary

Copyright Reasunos

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

Symbol	Parameter	Typ.	Max	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	3.8 3.2		V	V_{GS}=0V, I_{SD} =2.5A	T_j=25℃ T_j=175℃
I_S	Continuous DC Source Current, Limited by $T_{VJ(max)}$	8 5		A	T_C=25℃ T_C=100℃	
I_{SM}	Peak Reverse Drain Current, tp Limited by $T_{VJ(max)}$	14		A	T_C=25℃	
I_{rrm}	Peak Reverse Recovery Current	4.1 4.6		A	V_{DS}=400V V_{GS}=0V I_{SD}=4.5A di/dt=1.1KA/us	T_j=25℃ T_j=175℃
Q_{rr}	Reverse Recovery Charge	23 27		nC		T_j=25℃ T_j=175℃
t_{rr}	Reverse Recovery time	9.4 10.1		ns		T_j=25℃ T_j=175℃
Err	Reverse Recovery Energy	0.16 0.32		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	3.31		℃/W	

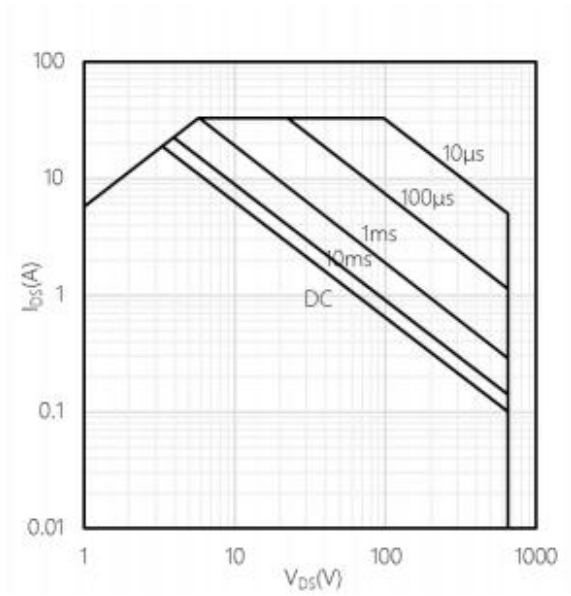
preliminary

Copyright Reasunos

Typical Feature Curve

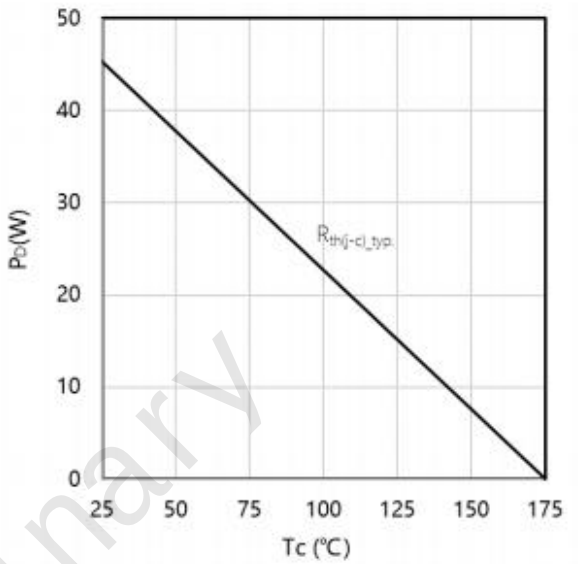
Safe operating area (SOA)

$R_{th(j-c)}$ =3.97 °C/W, Single Pulse, T_{VJ} = 25℃



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

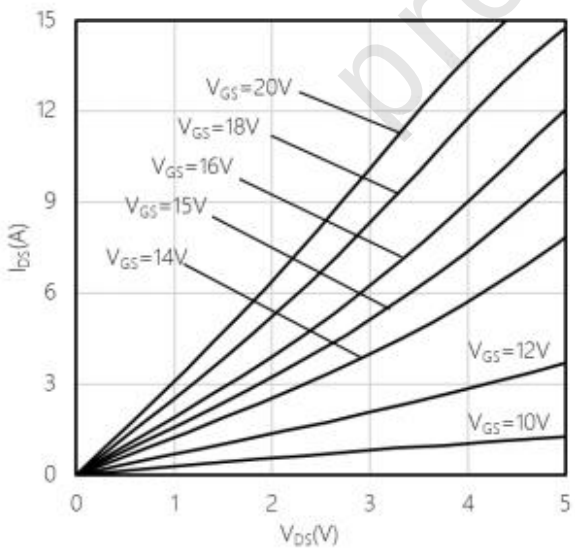
$P_D = f(T_C)$



Typical output characteristic, V_{GS} as parameter

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

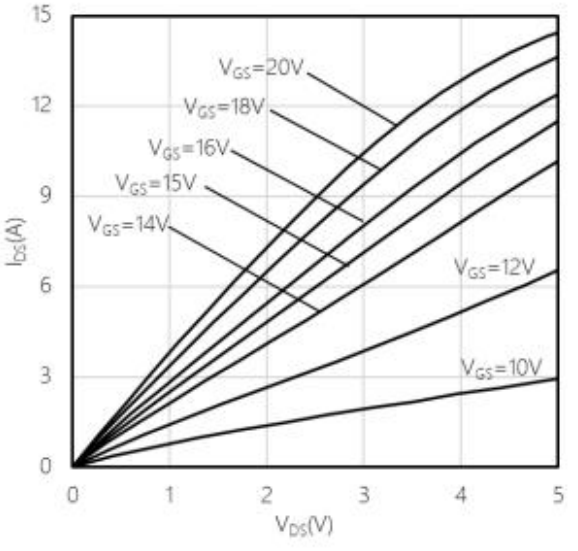
T_{VJ} = -55 ℃



Typical output characteristic, V_{GS} as parameter

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

T_{VJ} = 25 ℃



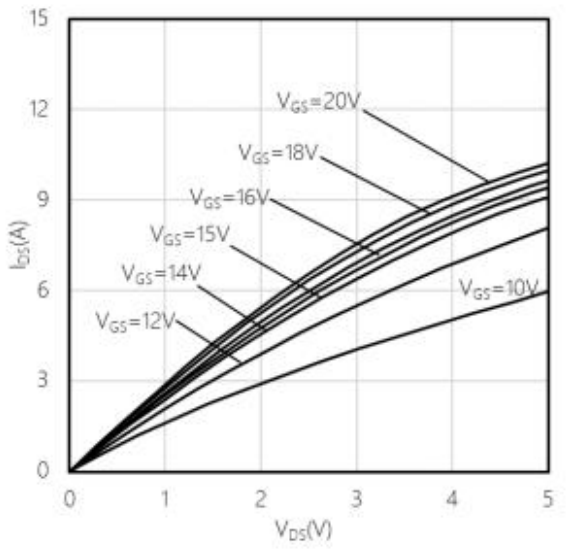
preliminary

Copyright Reasunos

Typical output characteristic, V_{GS} as parameter

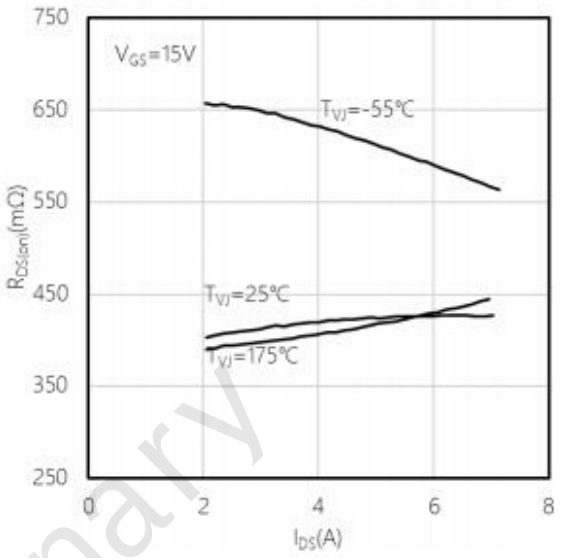
$I_{DS} = f(V_{DS})$

$T_{VJ} = 175℃$



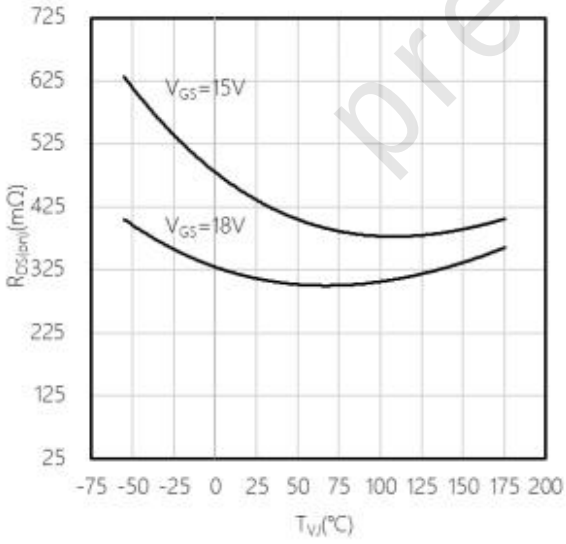
Typical on-state resistance as a function of drain current

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



Typical on-state resistance as a function of temperature

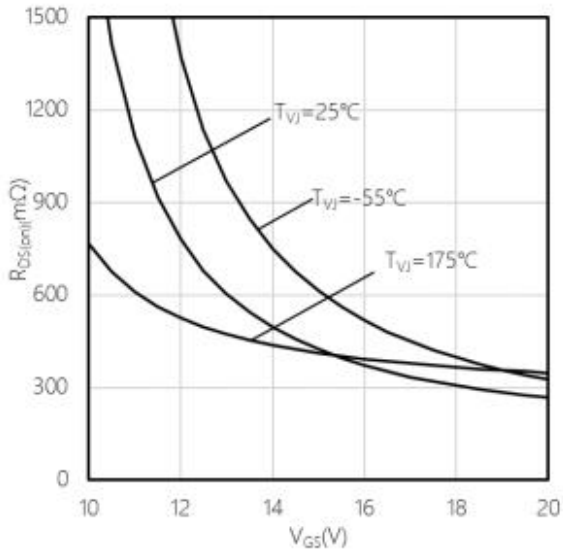
$R_{DS(on)} = f(T_{VJ})$, I_{DS} =4.5 A



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

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

I_{DS} =4.5 A



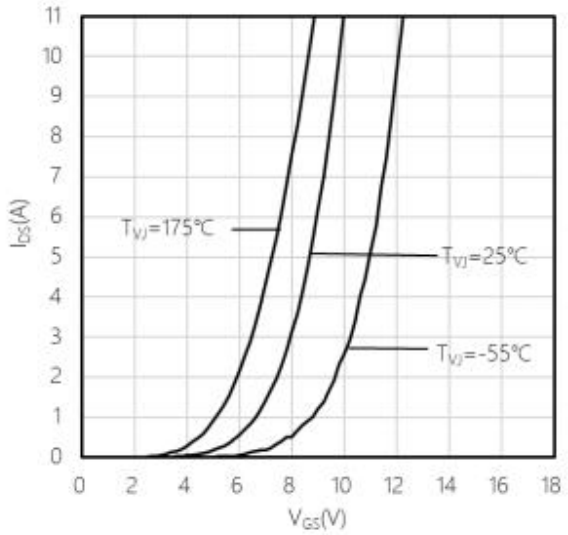
preliminary

Copyright Reasunos

Typical transfer characteristic

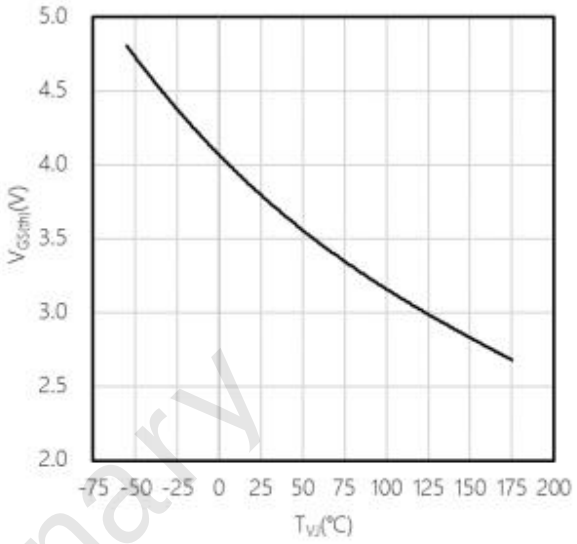
$I_{DS} = f(V_{GS})$

V_{DS}= 20 V



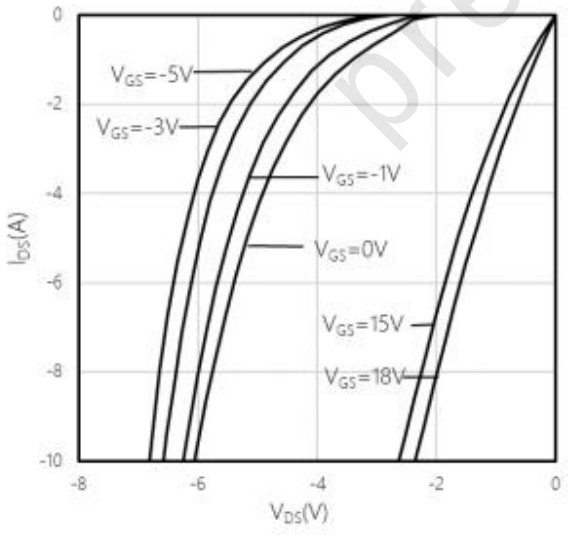
Typical gate-source threshold voltage as a function of junction temperature

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



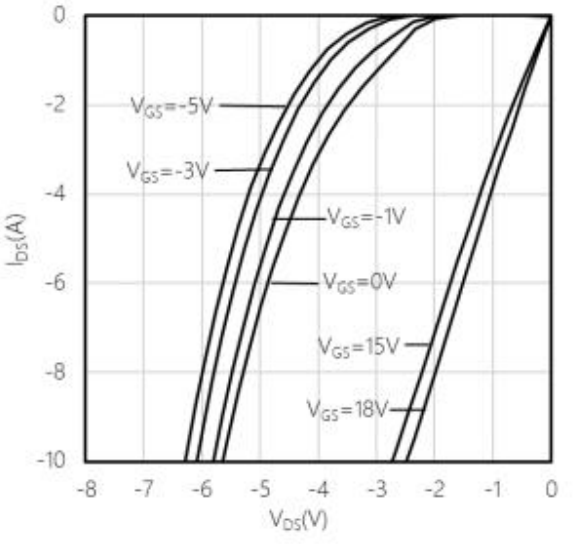
Typical reverse drain current as function of reverse drain voltage, V_{GS} as parameter

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

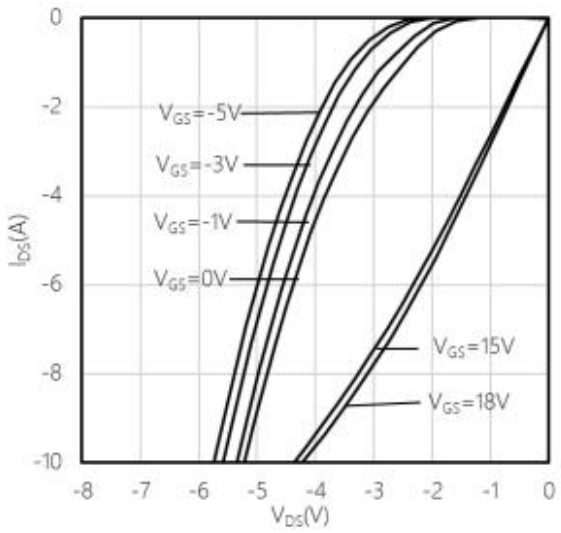


preliminary

Copyright Reasunos

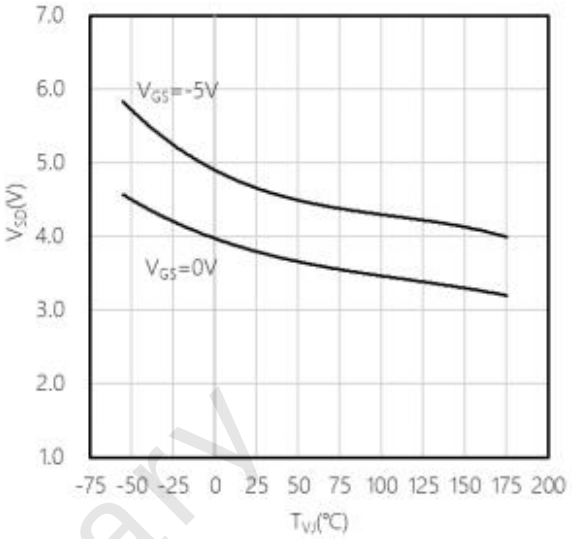
Typical reverse drain current as function of reverse drain voltage, V_{GS} as parameter

$I_{DS} = f(V_{DS})$, T_{VJ} = 175 °C



Typical reverse drain voltage as function of junction temperature

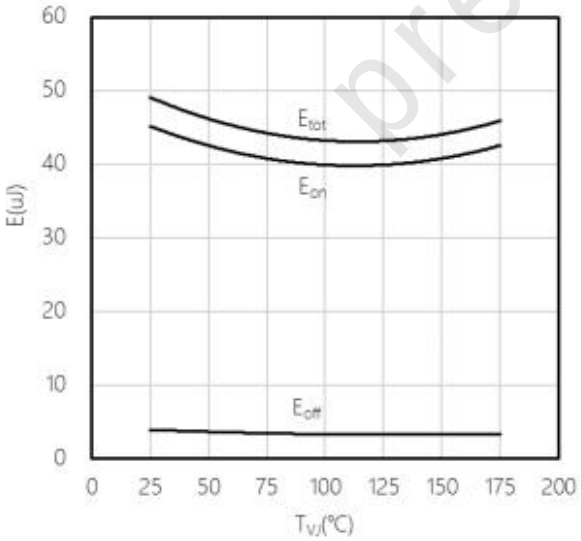
$V_{SD} = f(T_{VJ})$, I_{SD} = 2.5 A



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

E = f(T_{VJ})

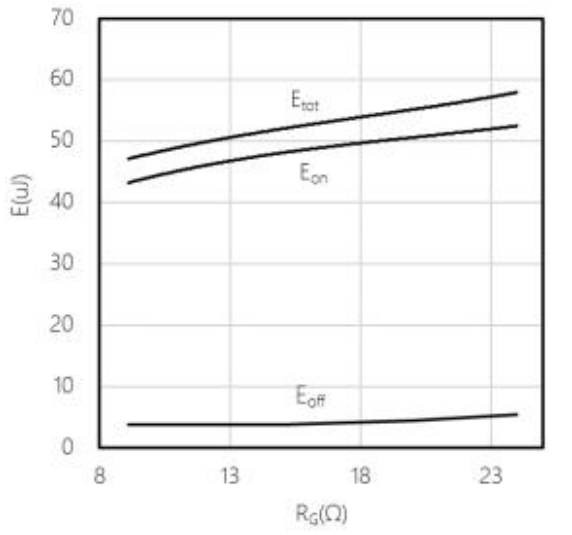
V_{DS} = 400 V, $R_{G(ext)}$ = 9.1 Ω, V_{GS} = 0V / 15 V, I_{DS} = 4.5 A



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} = 4.5 A, T_{VJ} = 25 °C, V_{DS} = 400 V



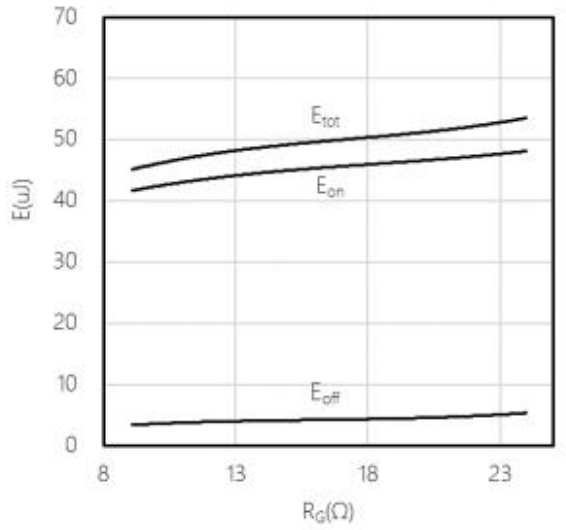
preliminary

Copyright Reasunos

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

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

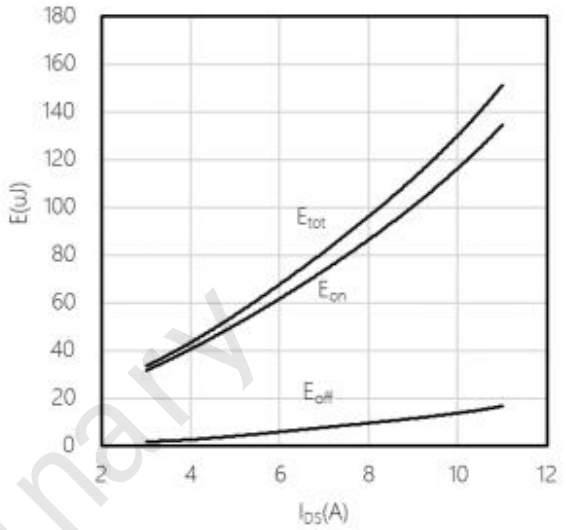
V_{GS} = 0/15 V, I_{DS} = 4 .5A, T_{VJ} = 175 °C, V_{DS} = 400 V



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

E = f(I_{DS})

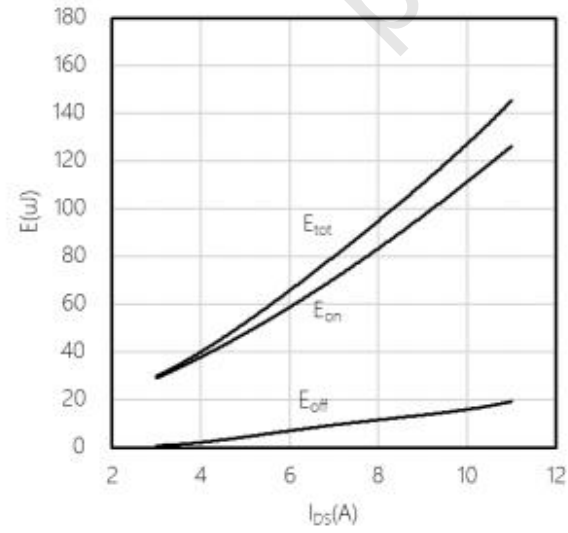
V_{GS} = 0/15 V, $R_{G(ext)}$ = 9.1 Ω, T_{VJ} = 25 °C, V_{DS} = 400 V



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

E = f(I_{DS})

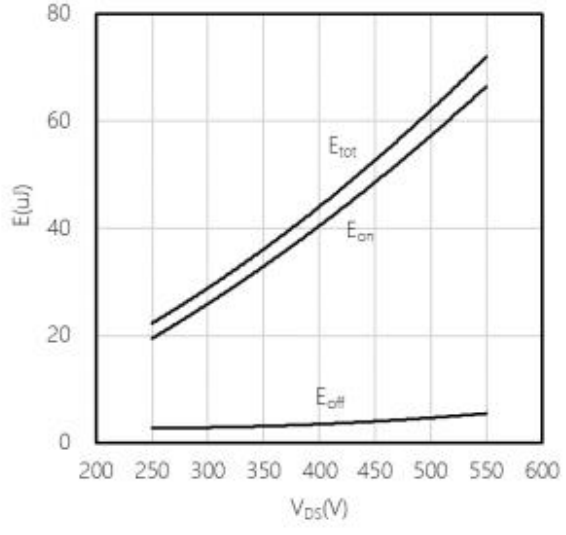
V_{GS} = 0/15 V, $R_{G(ext)}$ = 9.1 Ω, T_{VJ} = 175 °C, V_{DS} = 400 V



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, $R_{G(ext)}$ = 9.1 Ω, T_{VJ} = 25 °C, I_{DS} = 4.5 A



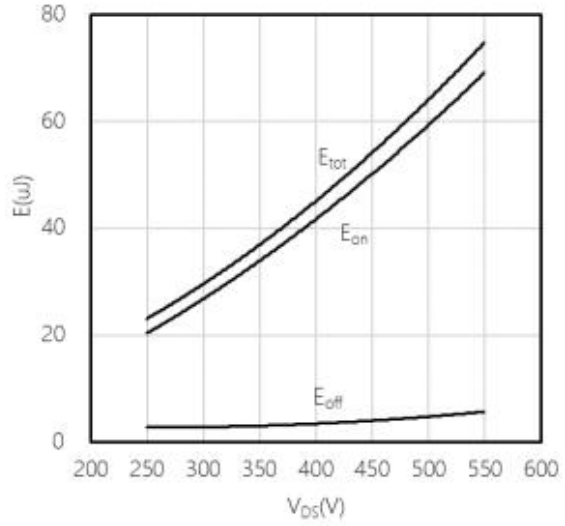
preliminary

Copyright Reasunos

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

E = f(V_{DS})

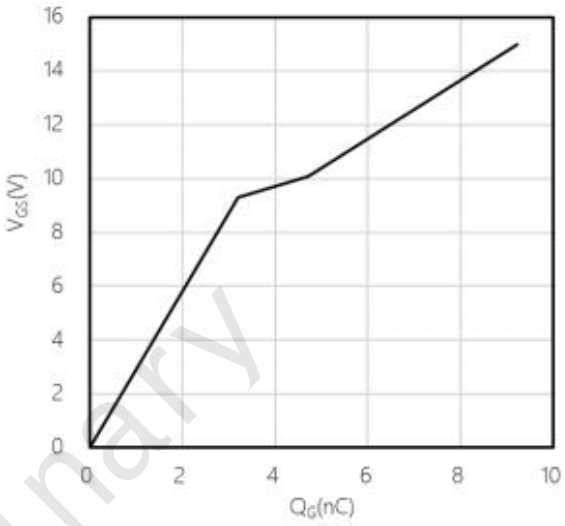
V_{GS} = 0/15 V, $R_{G(ext)}$ = 9.1 Ω, T_{VJ} = 175 ℃, I_{DS} = 4.5 A



Typical gate charge

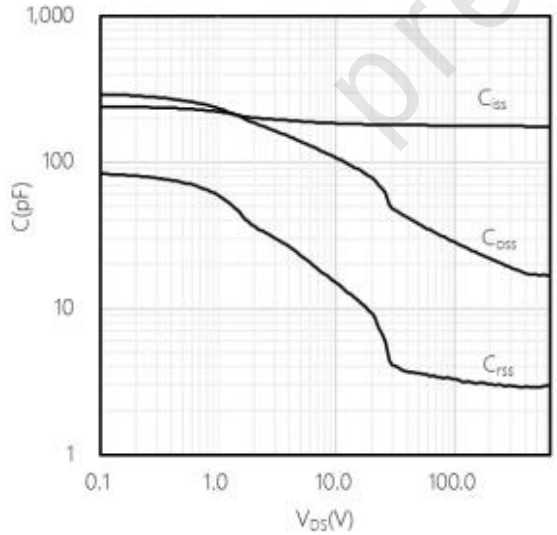
V_{GS} =f(Q_G), I_{DS} = 4.5A, V_{DS} = 400V

turn-on pulse



Typical capacitance as a function of drain-source voltage

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

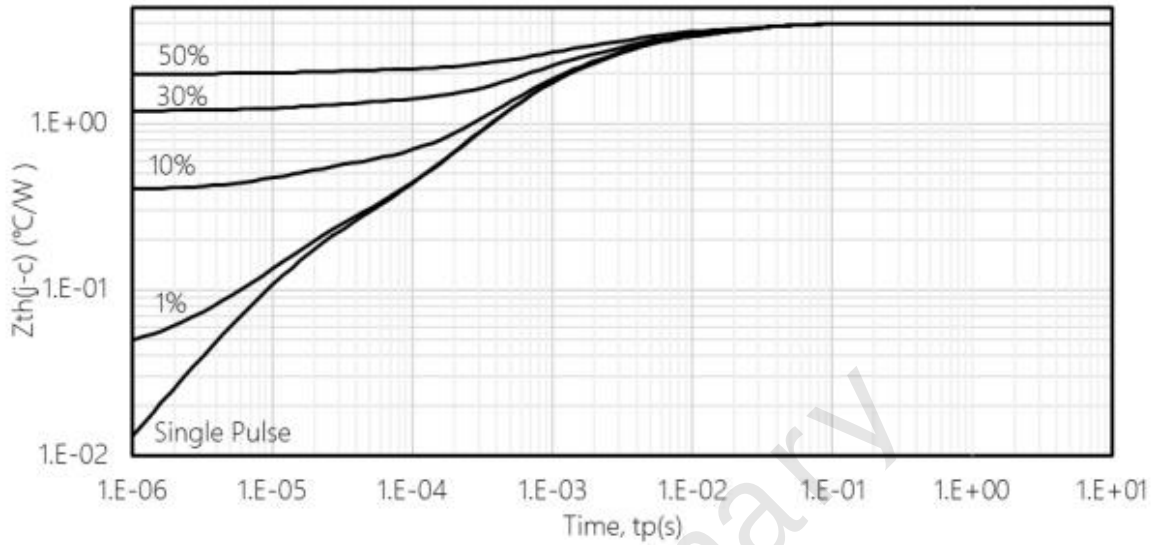


preliminary

Copyright Reasunos

Transient thermal resistance (MOSFET)

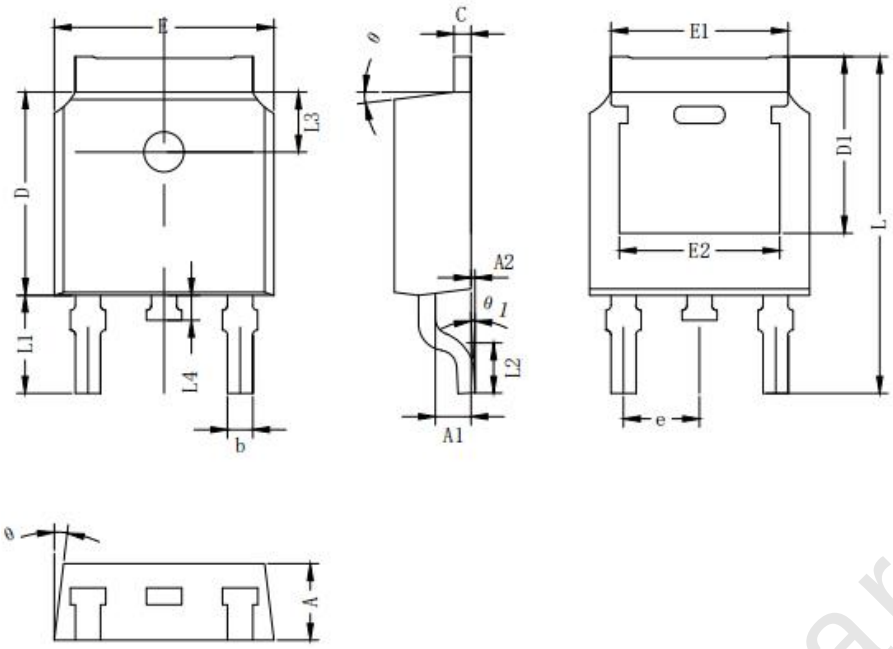
($Z_{th(j-c,max)}$ = f(t_p), Parameter D = t_p/T



preliminary

Copyright Reasunos

Package outline drawing(TO-252 Unit: 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°

preliminary

Copyright Reasunos

Disclaimers:

Reasunos Semiconductor Technology Co.Ltd (Reasunos) reserves the right to make changes without notice in order to improve reliability,function or design and to discontinue any product or service without notice .Customers should obtain the latest relevant information before orders and should verify that such information in current and complete.All products are sold subject to Reasunos's terms and conditions supplied at the time of orderacknowledgement.

Reasunos Semiconductor Technology Co.Ltd warrants performance of its hardware products to the speciffications at the time of sale.Testing,reliability and quality control are used to the extene Reasunos deems necessary to support this warrantee. Except where agreed upon by contr- actual agreement,testing of all parameters of each product is not necessarily performed.

Reasunos Semiconductor Technology Co.Ltd does not assume any liability arising from the use of any product or circuit designs described herein.Customers are responsible for their products and applications using Reasunos's components.To minimize risk,customers must provide adequate design and operating safeguards.

Reasunos Semiconductor Technology Co.Ltd does not warrant or convey any license eith- er expressed or implied under its patent rights,nor the rights of others.Reproduction of inform- ation in Reasunos's data sheeets or data books is permissible only if reproduction is without modification oralteration.Reproduction of this information with any alteration is an unfair and deceptive business practice. Reasunos Semiconductor Technology Co.Ltd is not responsi- ble or liable for such altered documentation.

Resale of Reasunos's products with statements different from or beyond the parameters stated by Reasunos Semiconductor Technology Co.Ltd for that product or service voids all exp- ress or implied warrantees for the associated Reasunos's product or service and is unfair and deceptive business practice. Reasunos Semiconductor Technology Co.Ltd is not responsi- ble or liable for such statements.

preliminary

Life Support Policy:

Reasunos Semiconductor Technology Co.Ltd's Products are not authorized for use as cri- tical components in life support devices or systems without the expressed written approval of Reasunos Semiconductor Technology Co.Ltd.

As used herein:

1. Life support devices or systems are devices or systems which: a.are intended for surgical implant into the human body, b.support or sustain life,
c.whose failuer to when properly used in accordance with instructions for used provided in the laeling,can be reasonably expected to result in significant injury to the user.

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.

Copyright Reasunos