

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

Product Summary



V_{DS}	-20	V
I_D	-4.5	A
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	40	m Ω
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$)	50	m Ω

Applications

- High Frequency Point-of-Load, Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	-4.5	A
Pulsed Drain Current ²	I_{DM}	-20	A
Total Power Dissipation	P_D	1.7	W
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}C$
Operating Junction Temperature Range	T_J	-55 to 150	$^{\circ}C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	---	73.5	$^{\circ}C/W$

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-20	---	---	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-4A	---	31	40	mΩ
		V _{GS} =-2.5V, I _D =-2A	---	37	50	mΩ
		V _{GS} =-1.8V, I _D =-1A	---	47	70	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250uA	-0.45	-0.7	-1	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	---	---	±100	nA
Forward Transconductance	g _{fs}	V _{DS} =-5V, I _D =-4.1A	---	13	---	S
Total Gate Charge	Q _g	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-4A	---	14.5	---	nC
Gate-Source Charge	Q _{gs}		---	2.2	---	
Gate-Drain Charge	Q _{gd}		---	2.5	---	
Turn-On Delay Time	T _{d(on)}	V _{DD} =-10V, R _L =2.2Ω, V _{GS} =-4.5V, R _G =1Ω, I _D =-3.2A	---	23	---	ns
Rise Time	T _r		---	25	---	
Turn-Off Delay Time	T _{d(off)}		---	55	---	
Fall Time	T _f		---	13	---	
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	1159	---	pF
Output Capacitance	C _{oss}		---	133	---	
Reverse Transfer Capacitance	C _{rss}		---	118	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ²	I _S		---	---	-5.3	A
Diode Forward Voltage ¹	V _{SD}	V _{GS} =0V, I _S =-5.3A, T _J =25°C	---	---	-1.2	V

Note:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%

Typical Characteristics

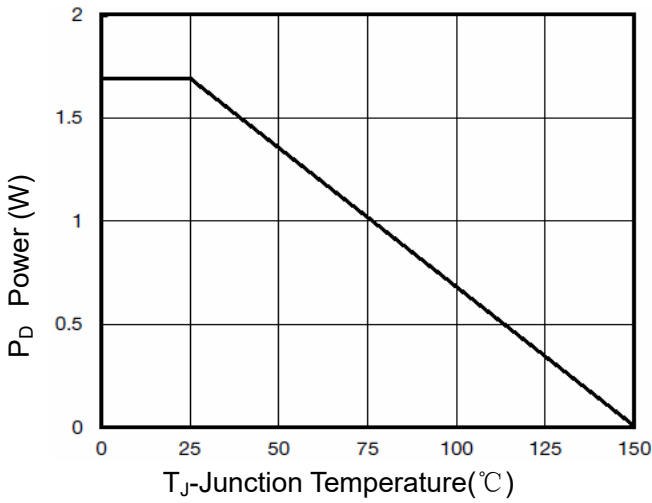


Figure 1 Power Dissipation

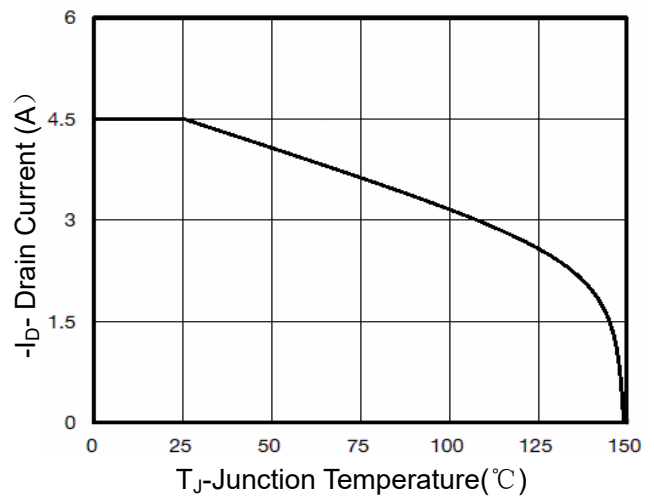


Figure 2 Drain Current

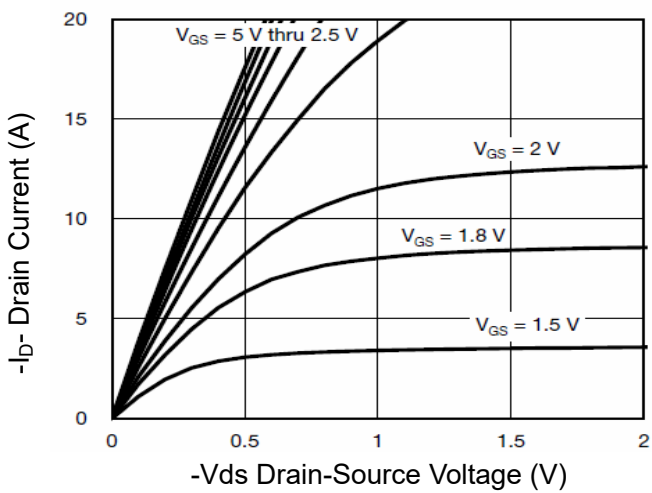


Figure 3 Output Characteristics

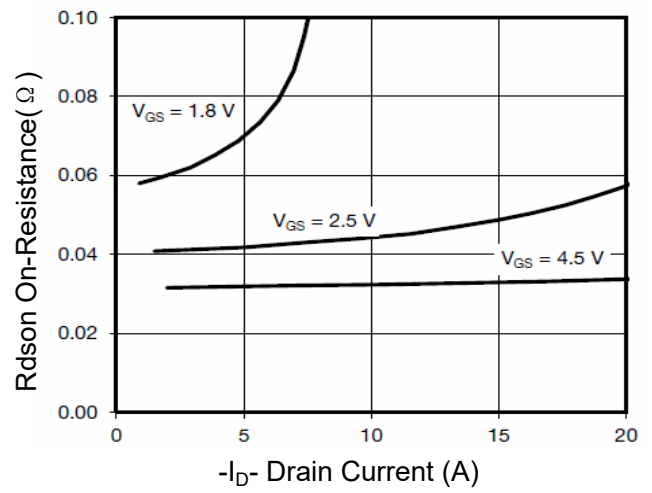


Figure 4 Drain-Source On-Resistance

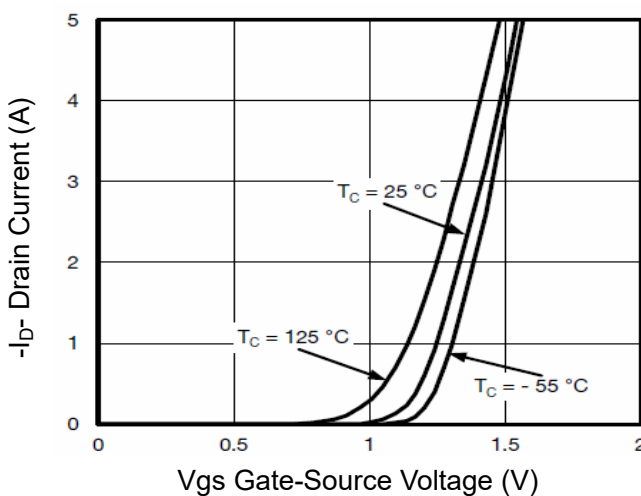


Figure 5 Transfer Characteristics

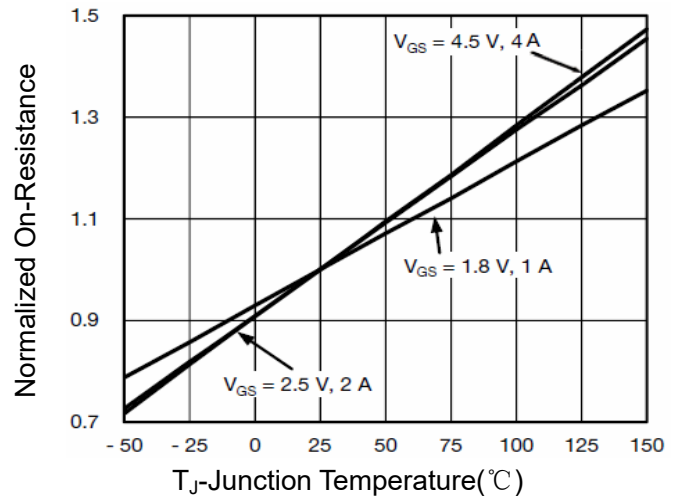


Figure 6 Drain-Source On-Resistance

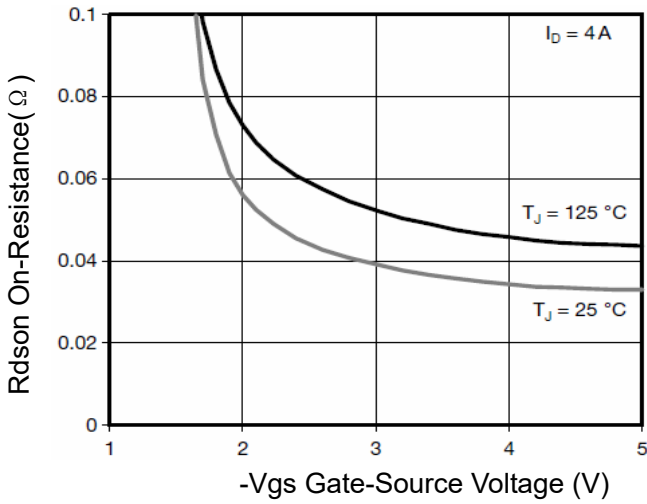


Figure 7 Rdson vs Vgs

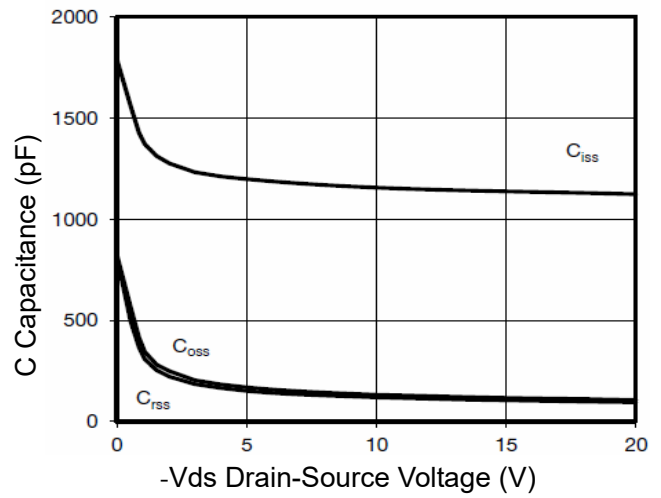


Figure 8 Capacitance vs Vds

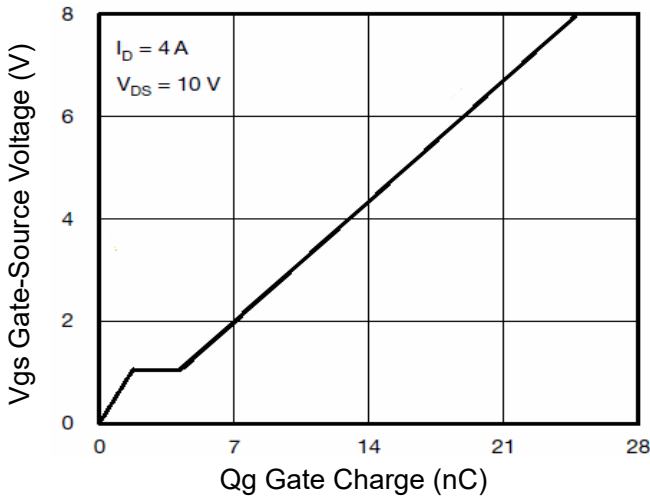


Figure 9 Gate Charge

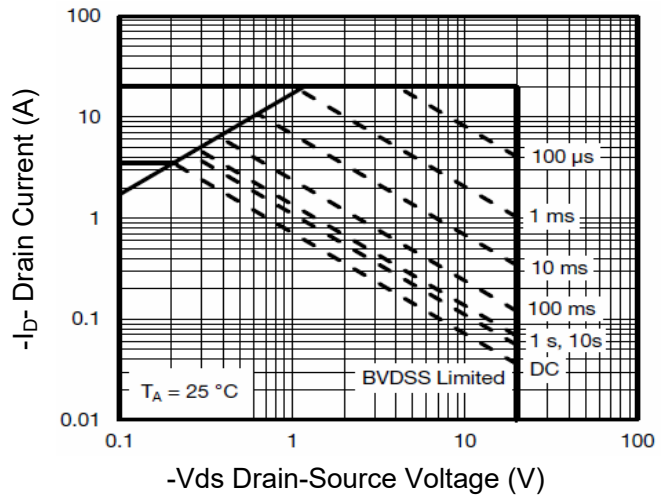


Figure 10 Safe Operation Area

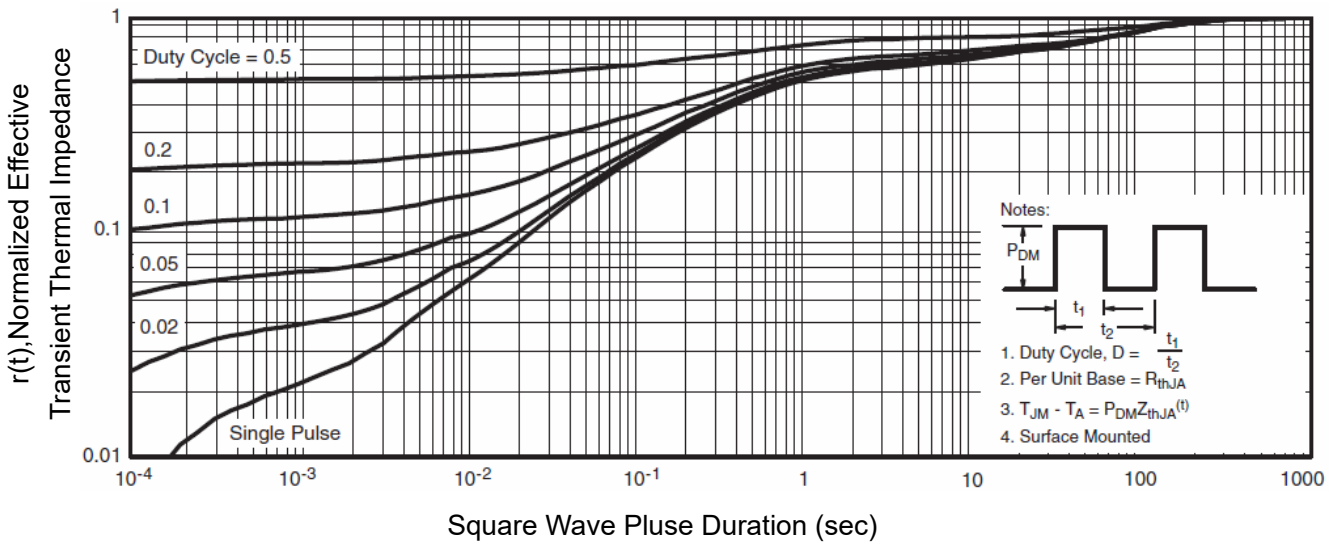
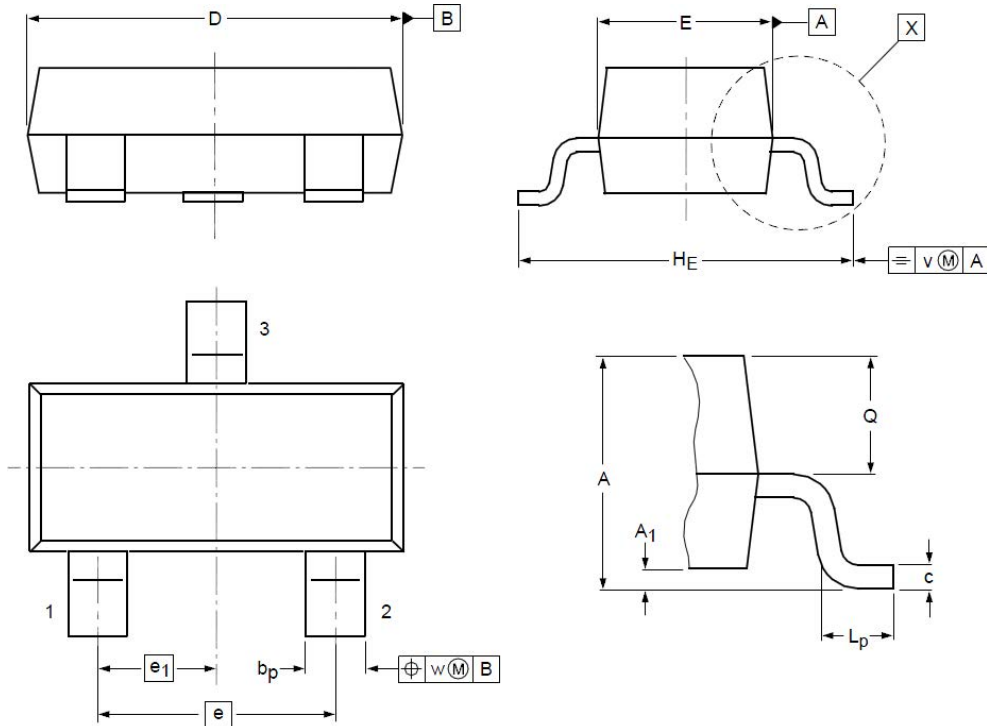


Figure 11 Normalized Maximum Transient Thermal Impedance

SOT23 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.90	1.05	1.20	e₁	--	0.95	--
A₁	0.01	0.05	0.10	H_E	2.10	2.40	2.50
b_p	0.38	0.42	0.48	L_p	0.40	0.50	0.60
c	0.09	0.13	0.15	Q	0.45	0.49	0.55
D	2.80	2.92	3.00	V	--	0.20	--
E	1.20	1.33	1.40	W	--	0.10	--
e	--	1.90	--				