

Features

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

Product Summary



V_{DS}	-30	V
I_D	-4.2	A
$R_{DS(ON)}$ (at $V_{GS}=-10V$)	65	m Ω
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	90	m Ω

Applications

- High Frequency Point-of-Load, Synchronous Buck Converter for MB/NB/UMPC/VGA
- 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}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D@T_A=25^{\circ}C$	-4.2	A
Pulsed Drain Current ²	I_{DM}	-15	A
Total Power Dissipation ³	$P_D@T_A=25^{\circ}C$	1.4	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	$R_{\theta JA}$	---	125	$^{\circ}C/W$

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-4A$	---	53	65	m Ω
		$V_{GS}=-4.5V, I_D=-3A$	---	63	90	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.0	---	-2.0	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Forward Transconductance	gfs	$V_{DS}=-4.5V, I_D=-4.2A$	---	10	---	S
Total Gate Charge	Q_g	$V_{DS}=-15V, V_{GS}=-10V, I_D=-4A$	---	10	---	nC
Gate-Source Charge	Q_{gs}		---	2.5	---	
Gate-Drain Charge	Q_{gd}		---	3	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=-15V, V_{GS}=-10V, R_G=3\Omega, R_L=3.6\Omega$	---	9	---	ns
Rise Time	T_r		---	5	---	
Turn-Off Delay Time	$T_{d(off)}$		---	28	---	
Fall Time	T_f		---	13.5	---	
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	610	---	pF
Output Capacitance	C_{oss}		---	100	---	
Reverse Transfer Capacitance	C_{rss}		---	65	---	

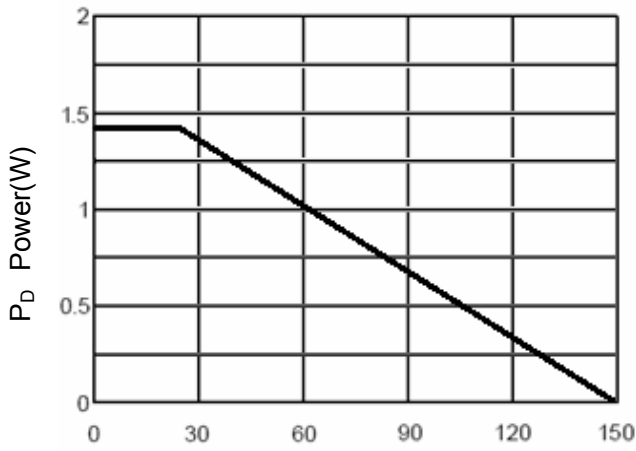
Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=-4.2A, T_J=25^\circ\text{C}$	---	---	-1.1	V

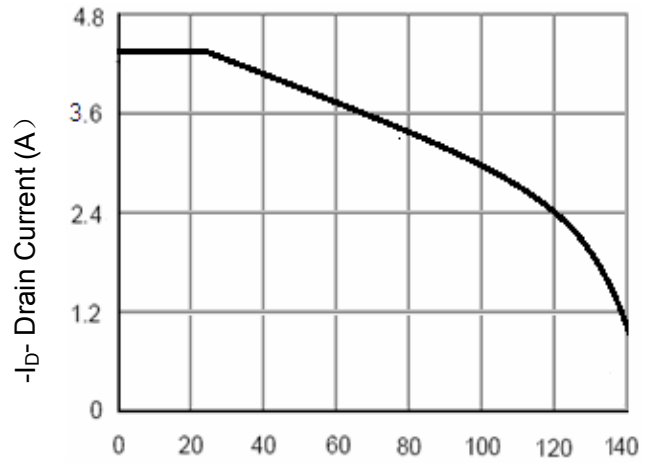
Note:

- 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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The power dissipation is limited by 150 $^\circ\text{C}$ junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics



T_J-Junction Temperature(°C)
Figure 1 Power Dissipation



T_J-Junction Temperature(°C)
Figure 2 Drain Current

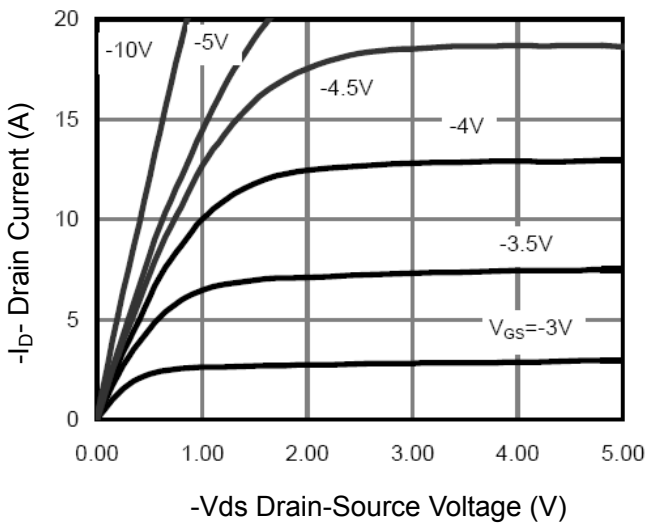


Figure 3 Output Characteristics

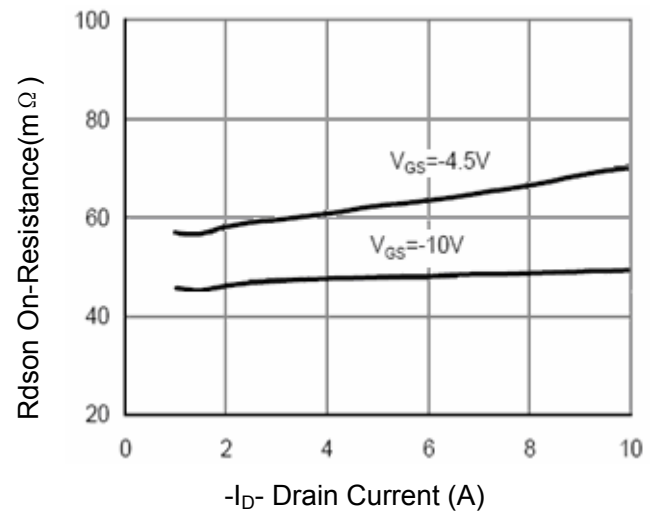


Figure 4 Drain-Source On-Resistance

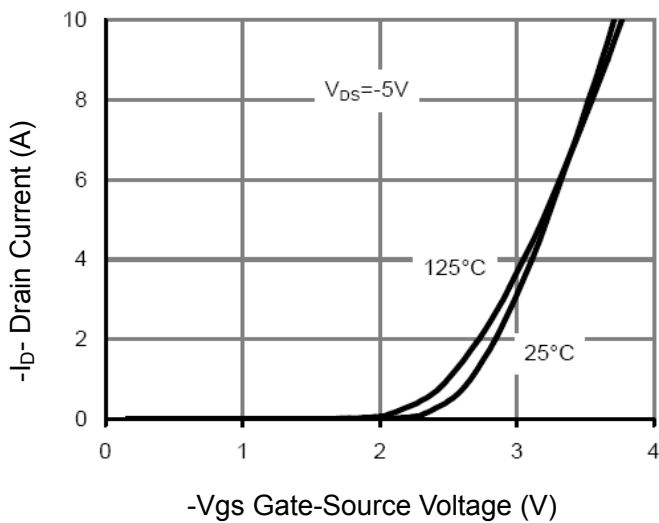


Figure 5 Transfer Characteristics

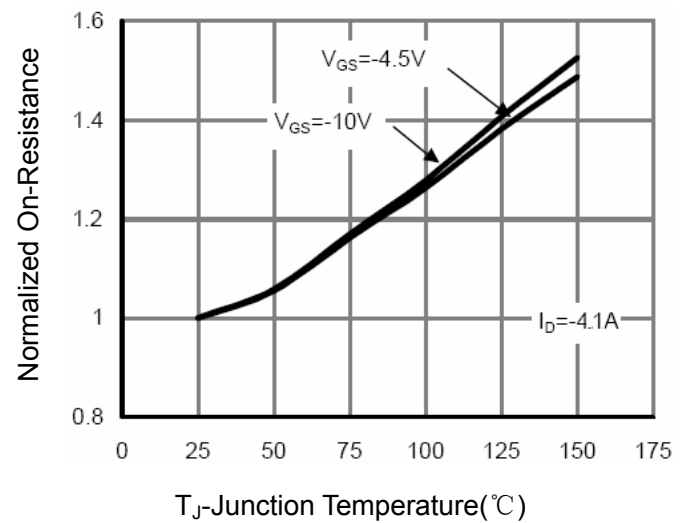


Figure 6 Drain-Source On-Resistance

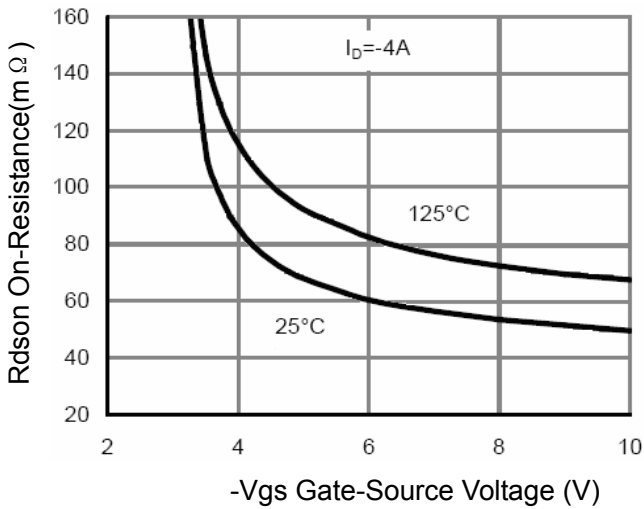


Figure 7 Rdson vs Vgs

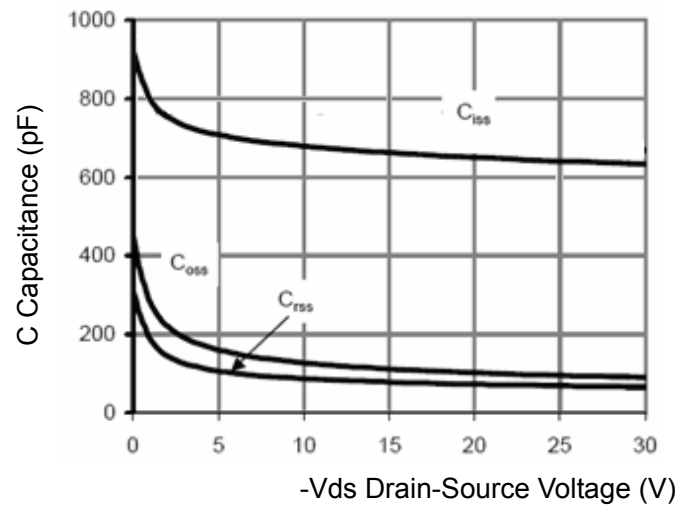


Figure 8 Capacitance vs Vds

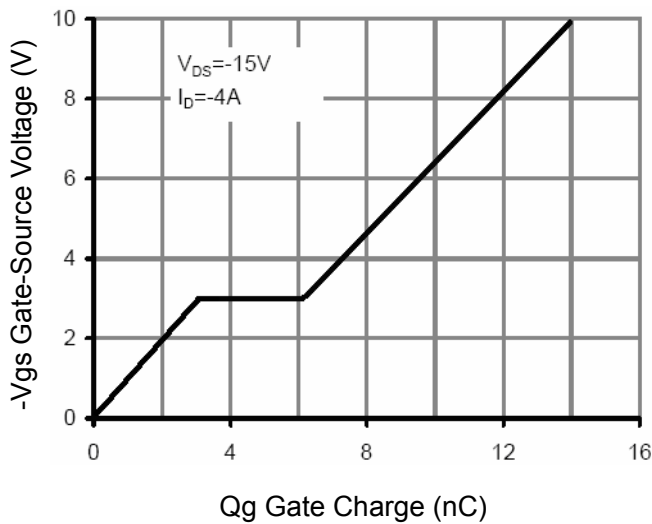


Figure 9 Gate Charge

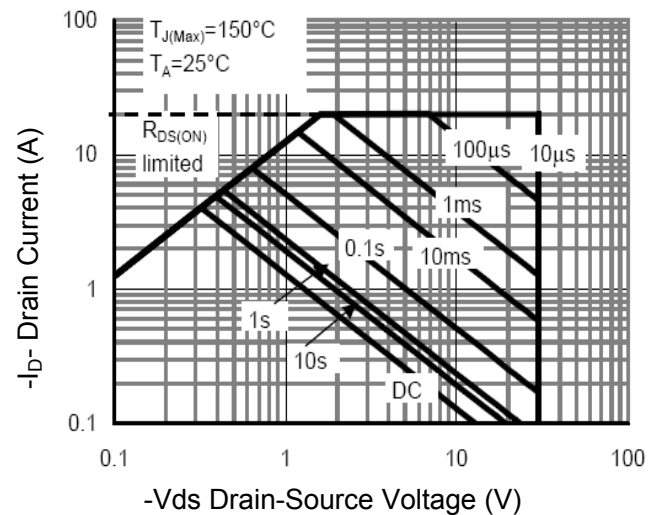


Figure 10 Safe Operation Area

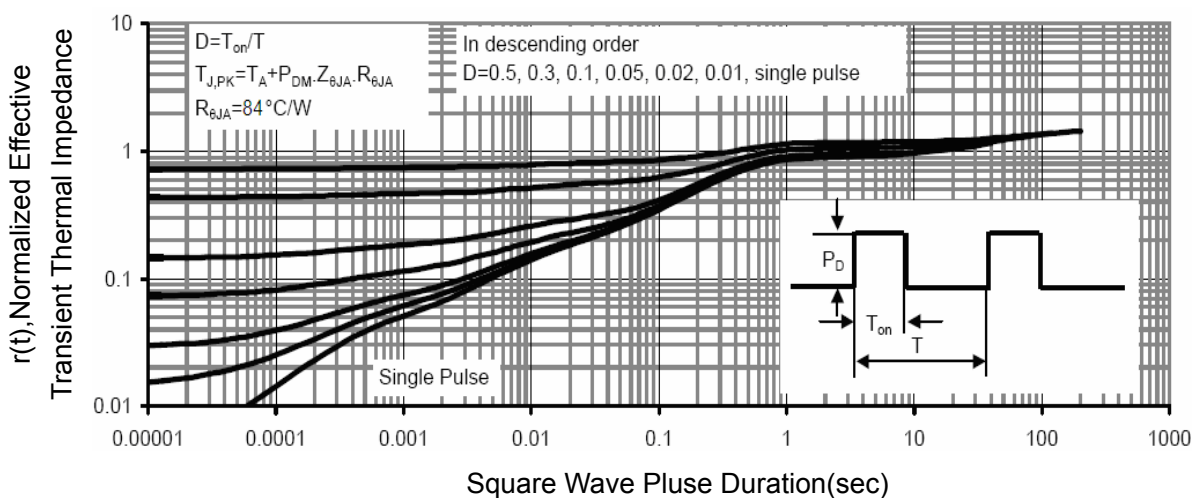
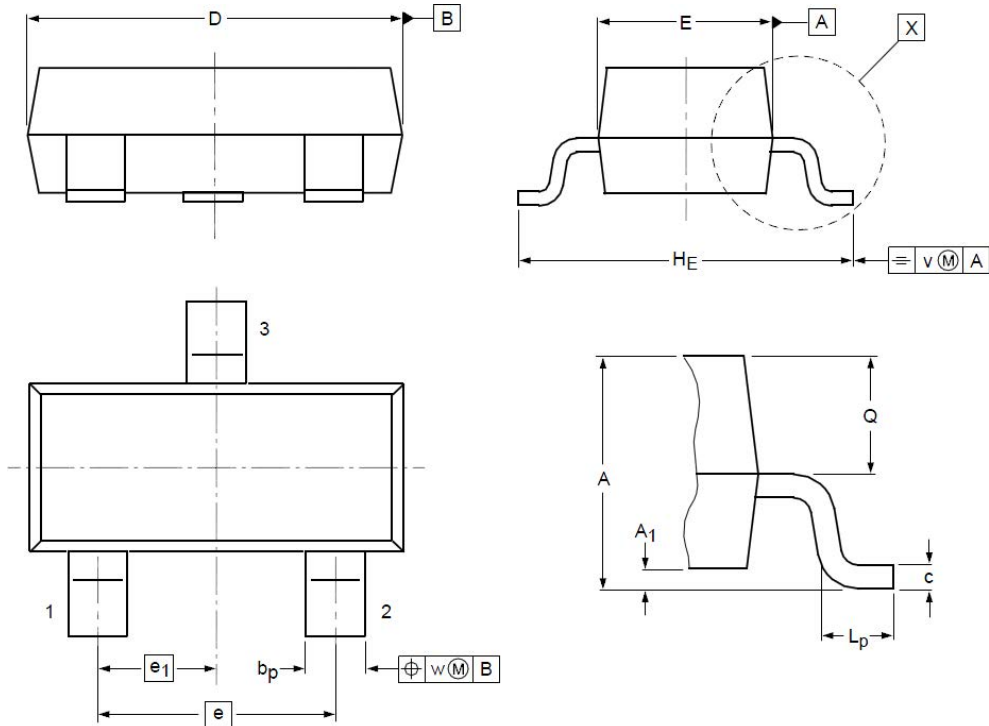


Figure 11 Normalized Maximum Transient Thermal Impedance

SOT23-3L Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.90	1.07	1.25	e₁	--	0.95	--
A₁	0.01	0.05	0.10	H_E	2.50	2.80	3.00
b_p	0.30	0.40	0.50	L_p	0.30	0.45	0.60
c	0.10	0.15	0.20	Q	0.23	0.28	0.33
D	2.70	2.90	3.10	V	--	0.20	--
E	1.40	1.55	1.75	W	--	0.20	--
e	--	1.90	--				