

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Green Device Available
- ESD Protected 2KV Embedded

Product Summary



V_{DS}	20	V
I_D	1.5	A
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	180	m Ω
$R_{DS(ON)}$ (at $V_{GS}=2.5V$)	250	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}	± 10	V
Continuous Drain Current ¹	$I_D@T_C=25^{\circ}C$	1.5	A
Continuous Drain Current ¹	$I_D@T_C=100^{\circ}C$	1.02	A
Pulsed Drain Current ²	I_{DM}	6	A
Total Power Dissipation ³	$P_D@T_C=25^{\circ}C$	0.43	W
Total Power Dissipation ³	$P_D@T_C=100^{\circ}C$	0.28	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	$R_{\theta JA}$	---	446	$^{\circ}C/W$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	290	$^{\circ}C/W$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=0.6A$	---	110	180	$m\Omega$
		$V_{GS}=2.5V, I_D=0.5A$	---	160	250	$m\Omega$
		$V_{GS}=1.8V, I_D=0.4A$	---	260	400	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	0.7	1	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$	---	---	± 100	nA
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=1.5A$	---	1	---	S
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=4.5V, I_D=0.75A$	---	1.4	---	nC
Gate-Source Charge	Q_{gs}		---	0.18	---	
Gate-Drain Charge	Q_{gd}		---	0.28	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DS}=10V, I_D=0.75A, V_{GS}=4.5V, R_G=3\Omega$	---	24	---	ns
Rise Time	T_r		---	86	---	
Turn-Off Delay Time	$T_{d(off)}$		---	750	---	
Fall Time	T_f		---	420	---	
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$	---	95	---	pF
Output Capacitance	C_{oss}		---	21	---	
Reverse Transfer Capacitance	C_{rss}		---	12	---	

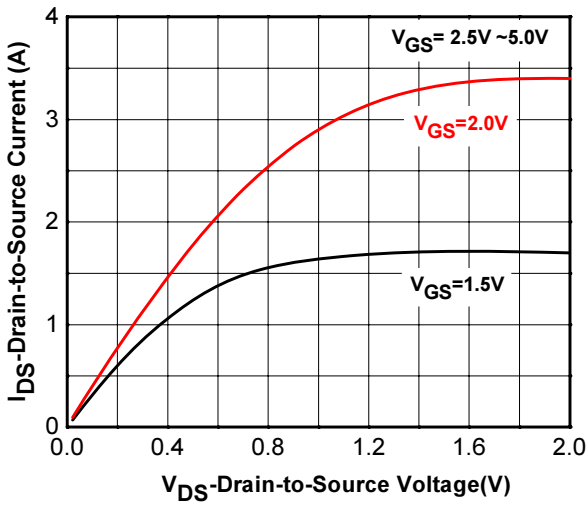
Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage ¹	V_{SD}	$V_{GS}=0V, I_S=1.5A, T_J=25^{\circ}\text{C}$	---	---	1.2	V

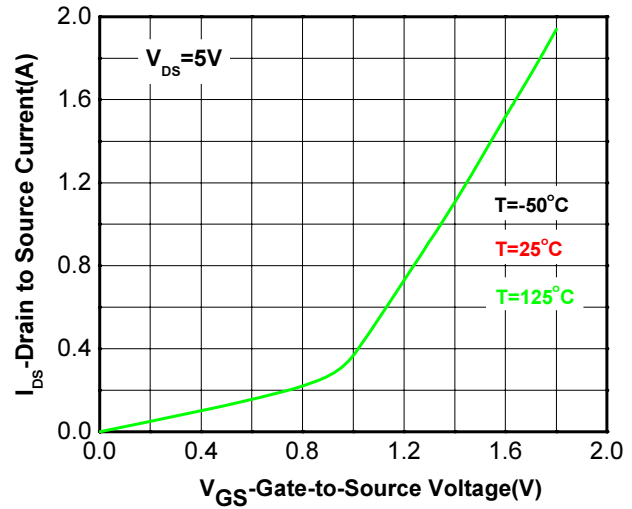
Note:

- 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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The power dissipation is limited by 150 $^{\circ}\text{C}$ junction temperature

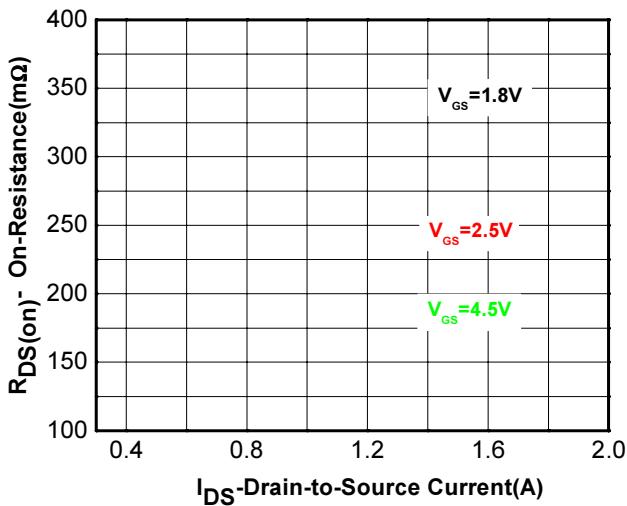
Typical Characteristics



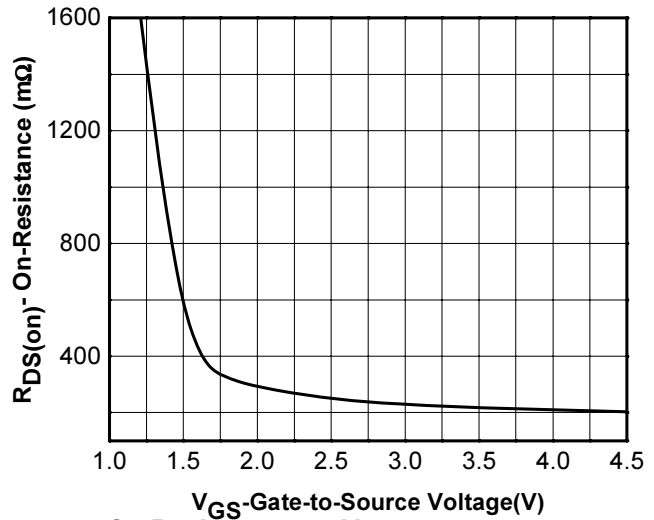
Output Characteristics



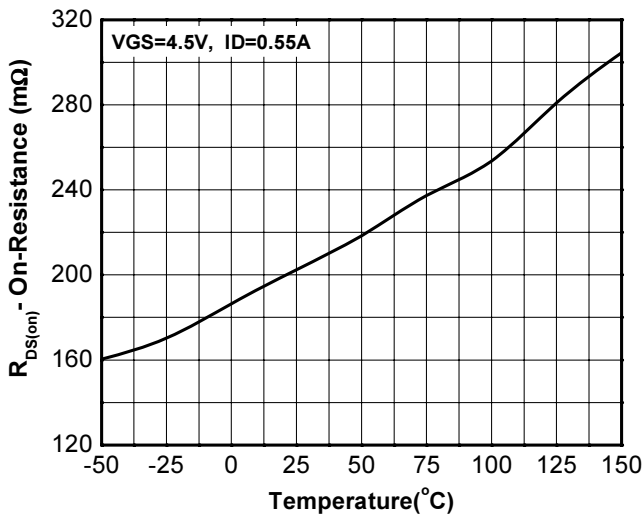
Transfer Characteristics



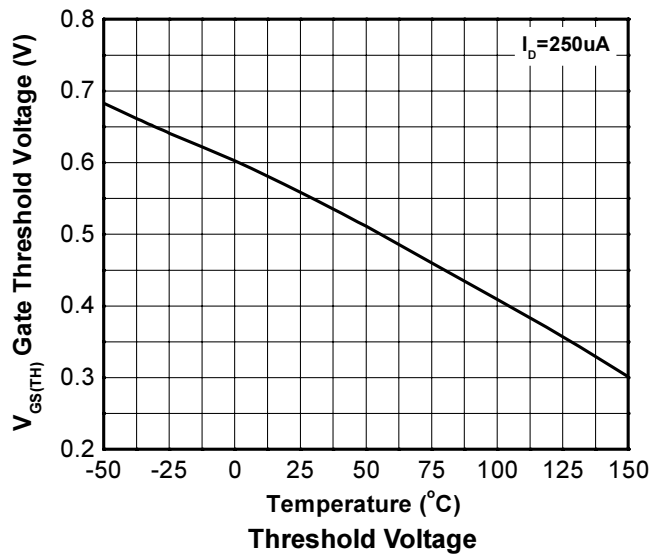
On Resistance vs. Drain Current



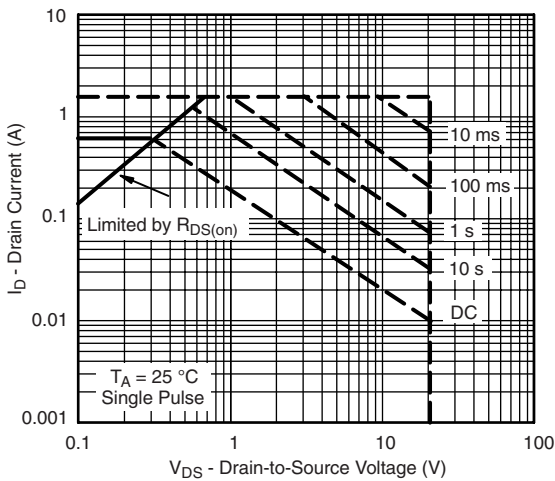
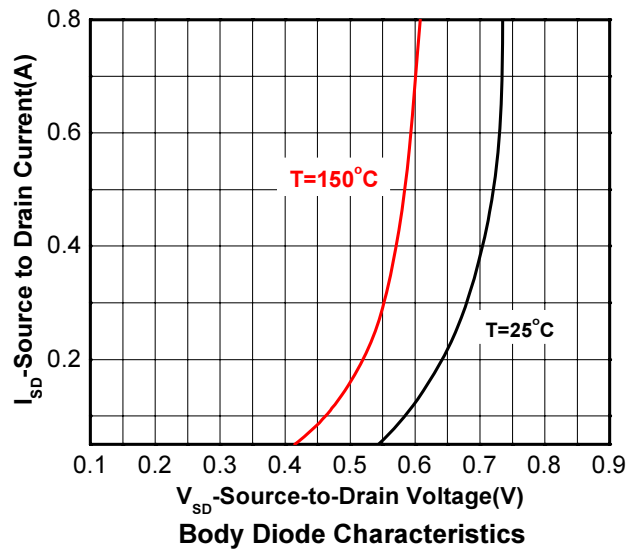
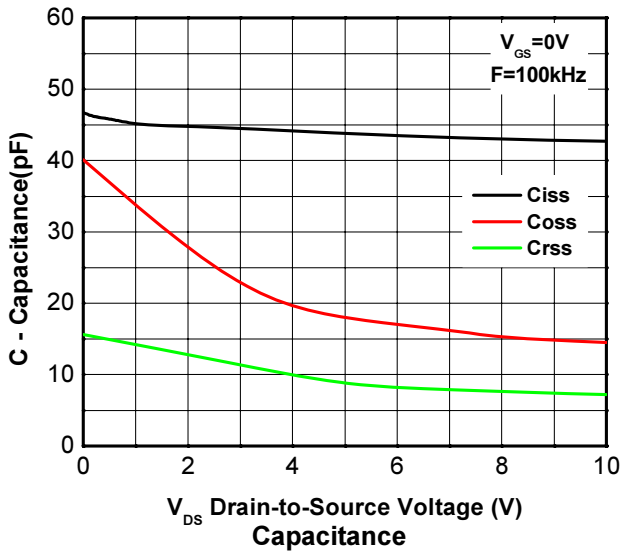
On Resistance vs. V_{GS} vs. Temperature



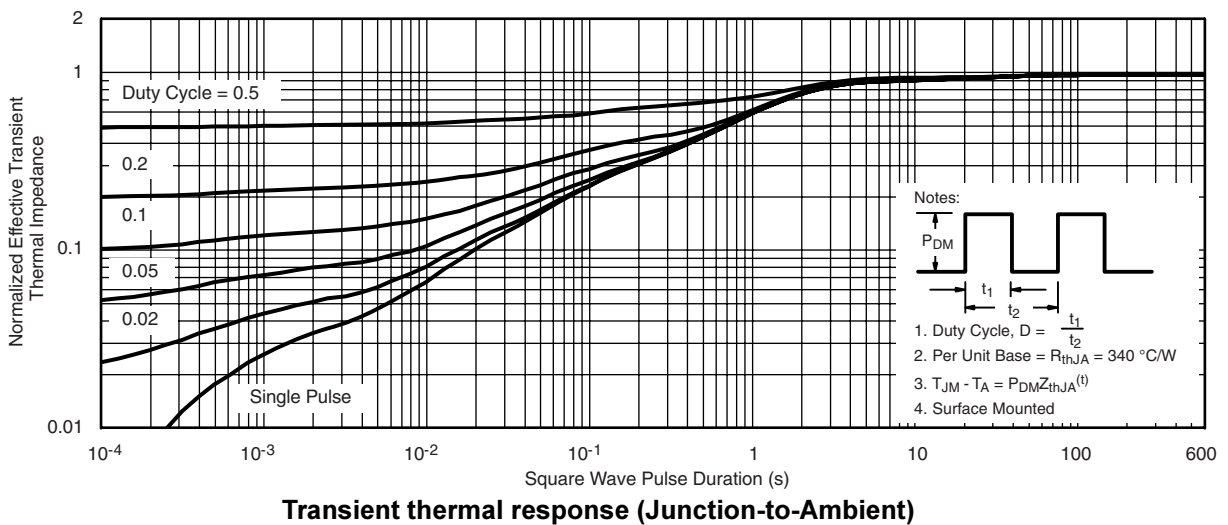
On Resistance vs. Junction Temperature



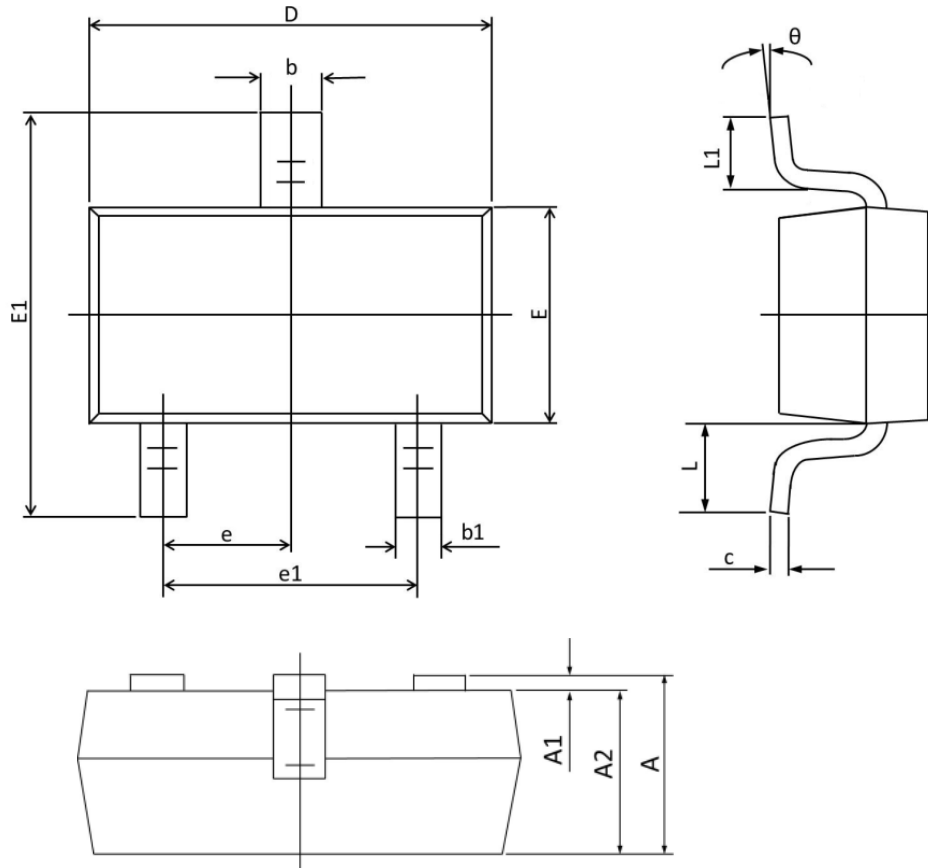
Threshold Voltage



Safe Operation Area, Junction-to-Ambient



SOT523 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.70	0.80	0.90	E	0.70	0.80	0.90
A1	0.00	---	0.10	E1	1.40	1.60	1.75
A2	0.70	0.75	0.80	e	0.50 REF		
b	0.25	0.30	0.35	e1	0.90	1.00	1.10
b1	0.15	0.20	0.25	L	0.30	0.36	0.48
c	0.10	0.15	0.20	L1	0.26	0.36	0.46
D	1.50	1.60	1.75	θ	0°		8°