

Features

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

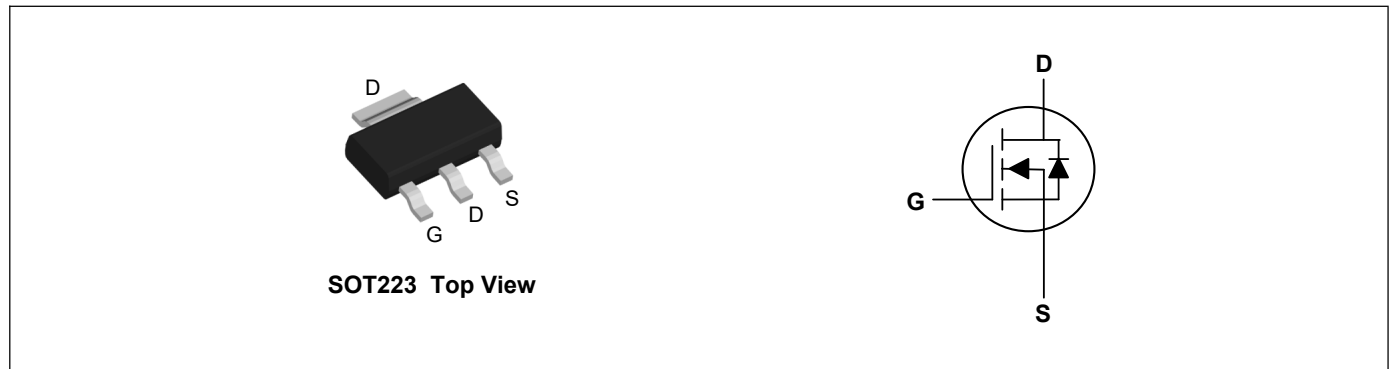
Product Summary



V_{DS}	60	V
I_D	5	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	40	m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	45	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}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	$I_D@T_A=25^{\circ}C$	5	A
Continuous Drain Current ¹	$I_D@T_A=70^{\circ}C$	4	A
Pulsed Drain Current ²	I_{DM}	48	A
Total Power Dissipation ³	$P_D@T_A=25^{\circ}C$	2.6	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	$R_{\theta JA}$	---	48	$^{\circ}C/W$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	8.2	$^{\circ}C/W$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=5A$	---	40	52	$m\Omega$
		$V_{GS}=4.5V, I_D=3A$	---	45	60	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.7	2.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=48V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=5A$	---	6	---	S
Total Gate Charge	Q_g	$V_{DS}=30V, V_{GS}=10V, I_D=5A$	---	18	---	nC
Gate-Source Charge	Q_{gs}		---	2.2	---	
Gate-Drain Charge	Q_{gd}		---	3.6	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DS}=30V, V_{GS}=10V, R_G=6\Omega, I_D=5A$	---	7	---	ns
Rise Time	T_r		---	8	---	
Turn-Off Delay Time	$T_{d(off)}$		---	40	---	
Fall Time	T_f		---	7	---	
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, f=1\text{MHz}$	---	725	---	pF
Output Capacitance	C_{oss}		---	45	---	
Reverse Transfer Capacitance	C_{rss}		---	35	---	

Drain-Source Diode Characteristics

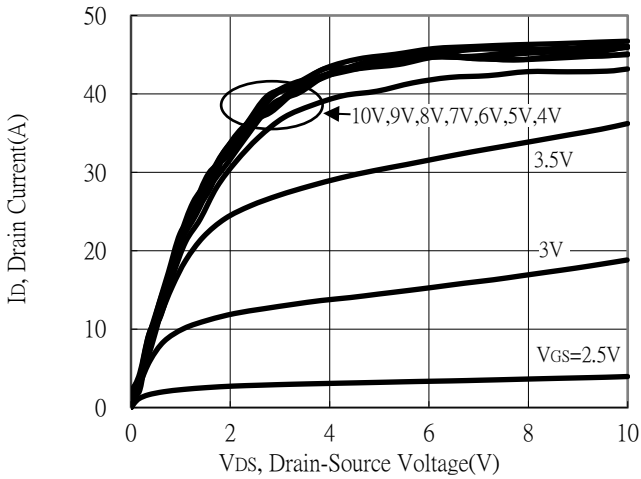
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=5A, T_J=25^{\circ}\text{C}$	---	0.8	1.2	V
Reverse Recovery Time	t_{rr}	$I_F=5A, V_R=0V$ $di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	12	---	nS
Reverse Recovery Charge	Q_{rr}		---	7.5	---	nC

Note:

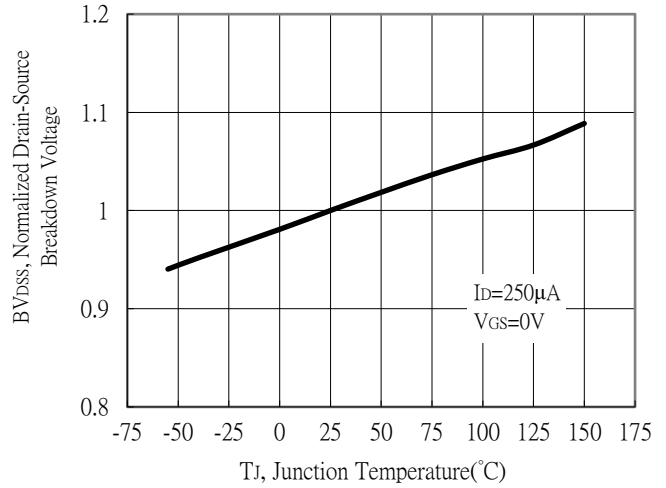
- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The power dissipation is limited by 150 $^{\circ}\text{C}$ junction temperature

Typical Characteristics

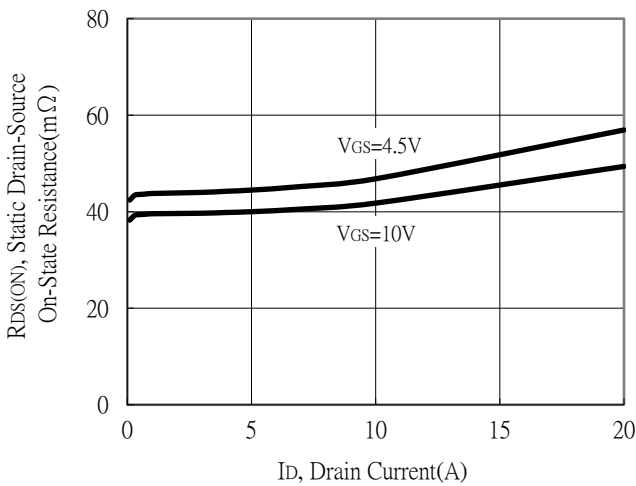
Typical Output Characteristics



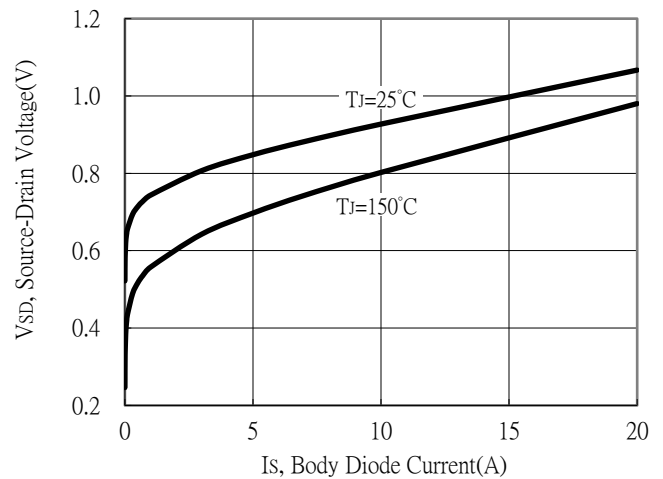
Breakdown Voltage vs Ambient Temperature



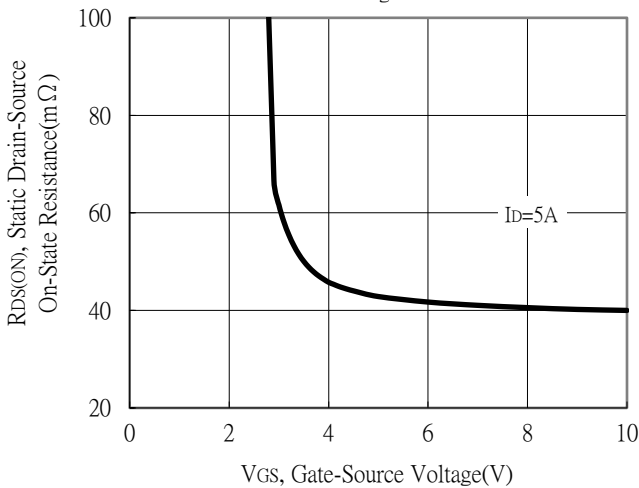
Static Drain-Source On-State resistance vs Drain Current



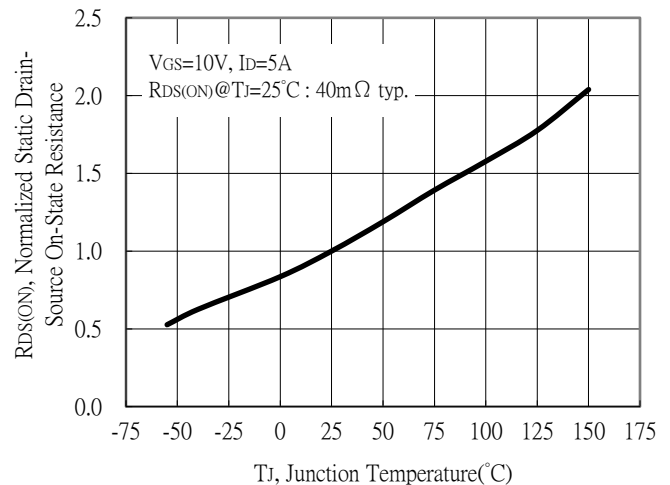
Body Diode Current vs Source-Drain Voltage



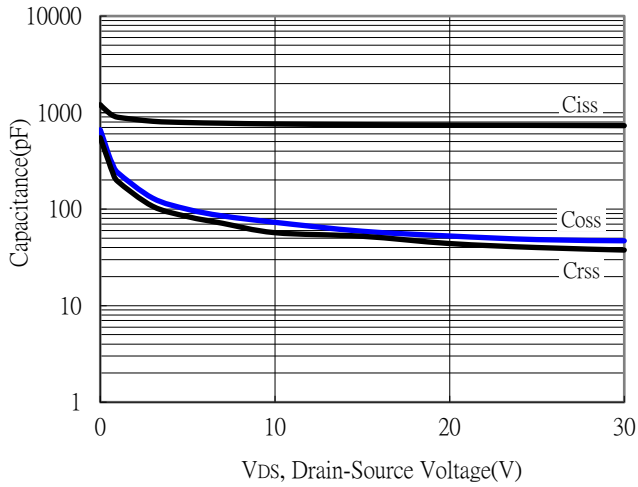
Static Drain-Source On-State Resistance vs Gate-Source Voltage



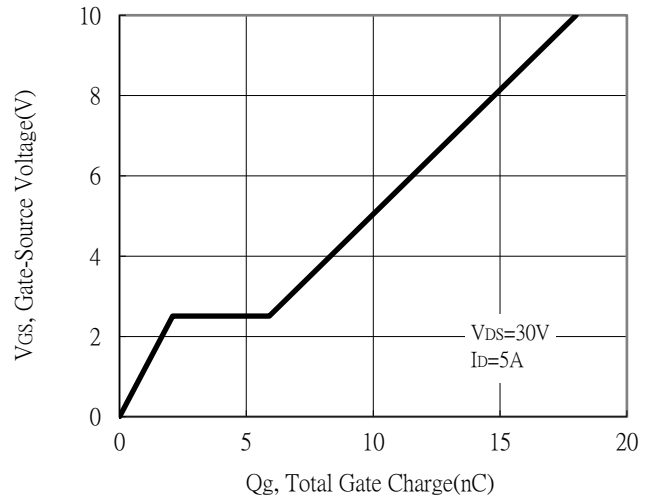
Drain-Source On-State Resistance vs Junction Temperature



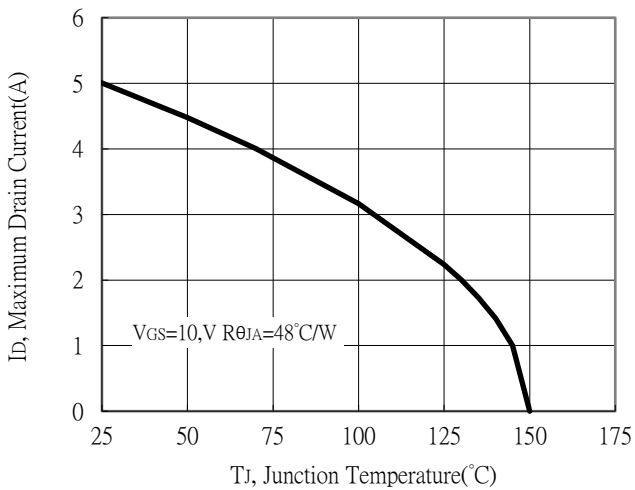
Capacitance vs Drain-to-Source Voltage



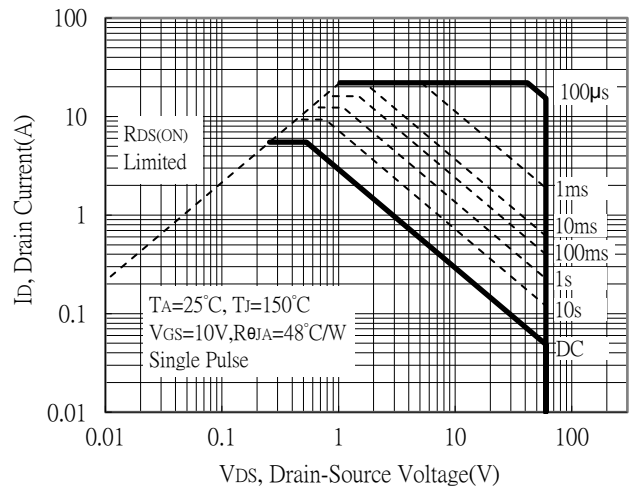
Gate Charge Characteristics



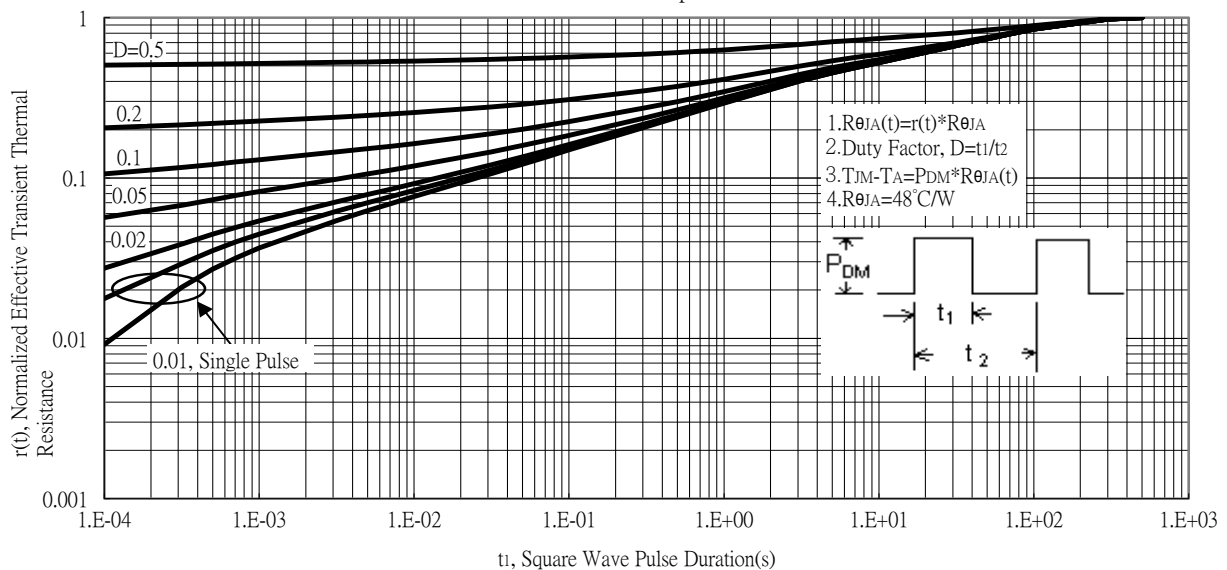
Maximum Drain Current vs Junction Temperature



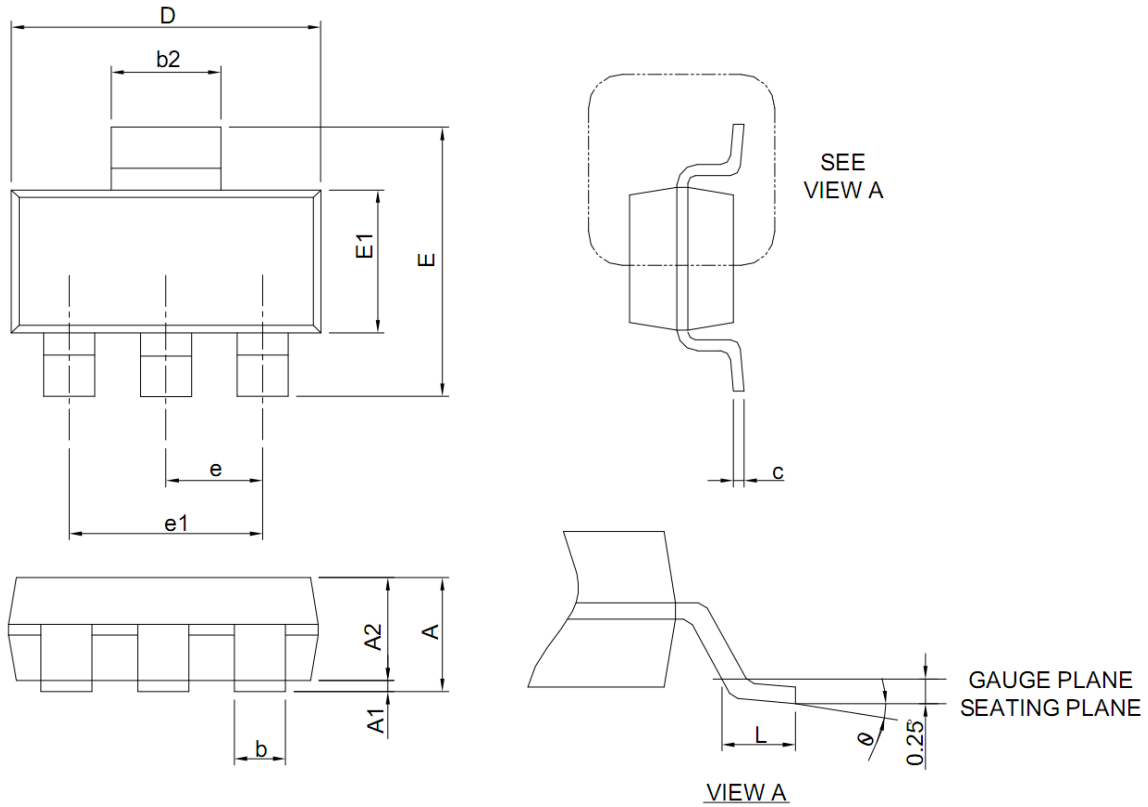
Maximum Safe Operating Area



Transient Thermal Response Curves



SOT223 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	1.50	1.65	1.80	A1	0.02	0.06	0.10
A2	1.50	1.60	1.70	b	0.66	0.72	0.80
b2	2.90	3.00	3.10	c	0.23	0.30	0.35
D	6.30	6.50	6.70	E	6.70	7.00	7.30
E1	3.30	3.50	3.70	e	2.30 REF		
e1	4.60 REF			L	0.75	--	1.15
θ	0°	--	10°				