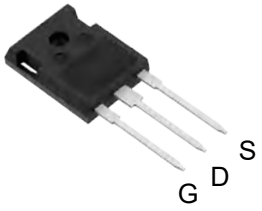
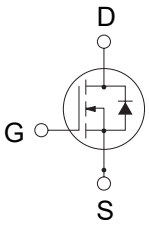
SMOS50N25B2

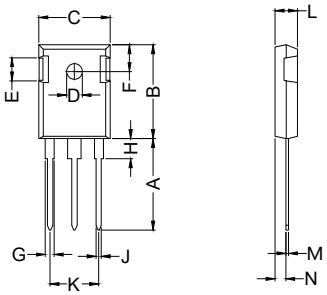
Power MOSFETs





G=Gate
D=Drain
S=Source

Dimensions TO-247AD



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.620	0.640
ØD	3.15	3.65	0.124	0.144
E	4.32	5.49	0.170	0.216
F	5.40	6.30	0.213	0.248
G	1.65	2.18	0.065	0.086
H	3.80	4.50	0.150	0.177
J	1.00	1.40	0.039	0.055
K	10.80	11.10	0.425	0.437
L	4.70	5.30	0.185	0.209
M	0.40	0.80	0.016	0.031
N	1.50	2.49	0.059	0.098

Symbol	Test Conditions	Maximum Ratings	Unit
V_{DSS}	T_J=25°C to 150°C	250	V
V_{DGR}	T_J=25°C to 150°C; R_{GS}=1MΩ	250	
V_{GS}	Continuous	±20	V
V_{GSM}	Transient	±30	
I_{D25}	T_C=25°C	50	A
I_{DM}	T_C=25°C; pulse width limited by T_{JM}	150	A
I_{AR}	T_C=25°C	50	A
E_{AR}	T_C=25°C	15.8	mJ
dv/dt	$I_S \le I_{DM}$; di/dt≤100A/us; $V_{DD} \le V_{DSS}$ $T_J \le 150°C$; R_G=2Ω	2.5	V/ns
P_D	T_C=25°C	260	W
T_J		-55...+150	°C
T_{JM}		150	
T_{stg}		-55...+150	
T_L	1.6mm(0.062 in.) from case for 10s	300	°C
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight	typical	6	g

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(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
V_{DSS}	V_{GS}=0V; I_D=250uA	250			V
$V_{GS(th)}$	V_{DS}=V_{GS}; I_D=4mA	3.0	3.5	4.0	V
I_{GSS}	V_{GS}=±20V_{DC}; V_{DS}=0			±10	uA
I_{DSS}	V_{DS}=0.8V_{DSS}; T_J=25°C			100	uA
	V_{GS}=0V; T_J=125°C			1.0	mA

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
$R_{DS(on)}$	V_{GS}=10V; I_D=0.5I_{D25} Pulse test, t≤300us, duty cycle≤2%		0.050	0.065	Ω
g_{ts}	V_{DS}=10V; I_D=0.5I_{D25}; pulse test	8	35		S
C_{ies}	V_{GS}=0V; V_{DS}=25V; f=1MHz		3000		pF
C_{oes}			500		
C_{res}			55		
$Q_{g(on)}$	V_{GS}=10V; V_{DS}=0.5V_{DSS}'; I_D=0.5I_{D25}		35	60	nC
Q_{gs}			11	23	
Q_{gd}			4	11	
$t_{d(on)}$	V_{GS}=10V; V_{DS}=0.5V_{DSS}; I_D=0.5I_{D25} R_G=2Ω (External)		10	15	ns
t_r			18	25	ns
$t_{d(off)}$			22	36	ns
t_f			8	15	ns
R_{thJC}				0.570	K/W
R_{thCK}			0.211		K/W

Source-Drain Diode

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions		Characteristic Values			Unit
			min.	typ.	max.	
I_S	V_{GS}=0V				50	A
I_{SM}	Repetitive; pulse width limited by T_{JM}				150	A
V_{SD}	I_F=I_S; V_{GS}=0V; Pulse test, t≤300us, duty cycle d≤2%				1.70	V
t_{rr}	I_F=I_S; -di/dt=100A/us; V_R=100V;	T_J=25°C		140	200	ns
		T_J=125°C		280	400	ns
Q_{RM}		T_J=25°C		0.6		uC
		T_J=125°C		1.2		uC
I_{RM}		T_J=25°C		50		A
		T_J=125°C		50		A

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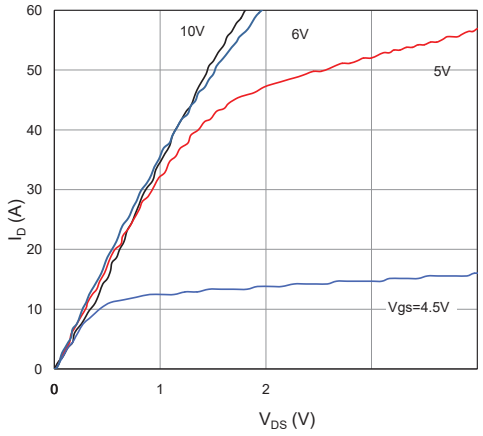

Fig 1. Typical Output Characteristics

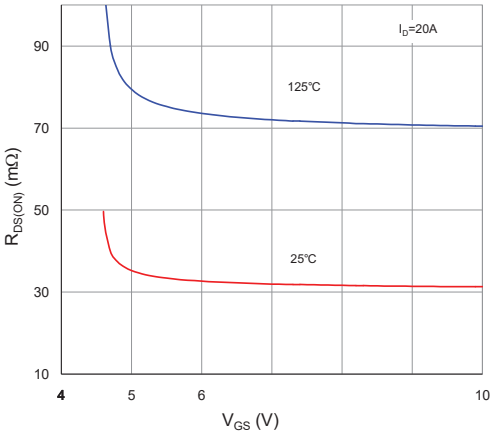

Figure 2. On-Resistance vs. Gate-Source Voltage

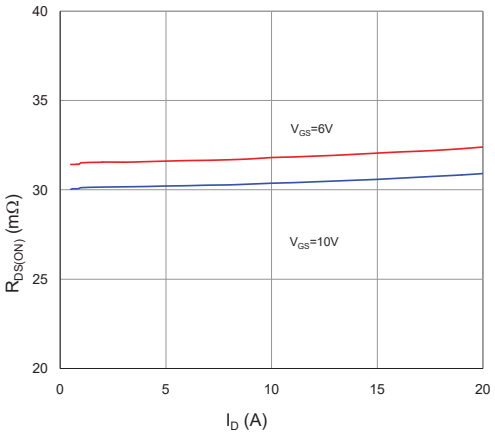

Figure 3. On-Resistance vs. Drain Current and Gate Voltage

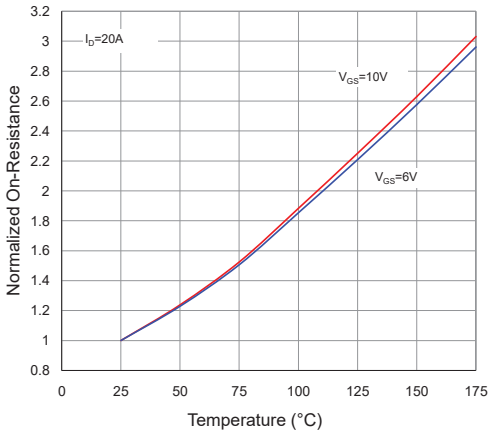

Figure 4. Normalized On-Resistance vs. Junction Temperature

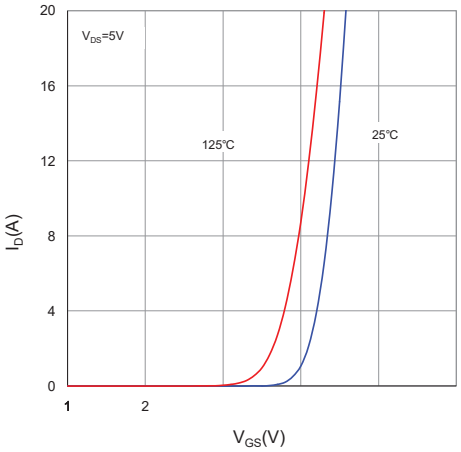

Figure 5. Typical Transfer Characteristics

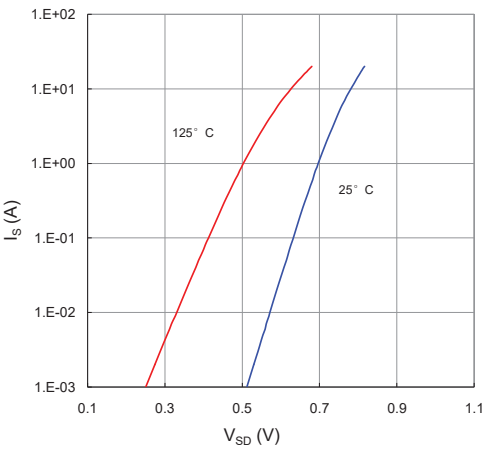

Figure 6. Typical Source-Drain Diode Forward Voltage

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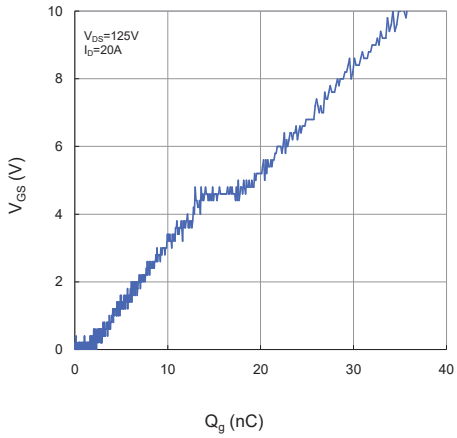

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

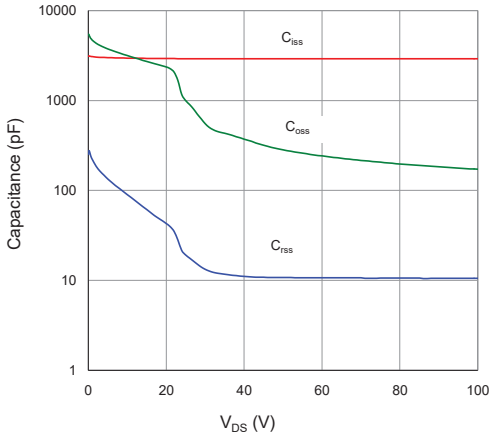

Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

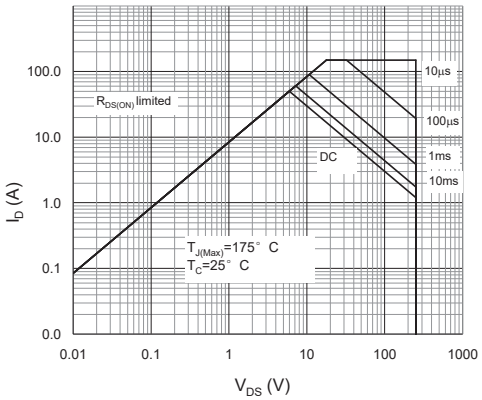

Figure 9. Maximum Safe Operating Area

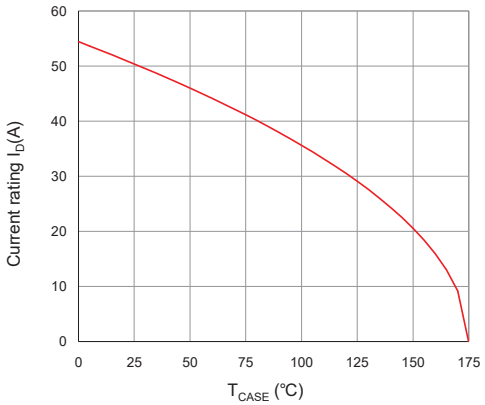

Figure 10. Maximun Drain Current vs. Case Temperature

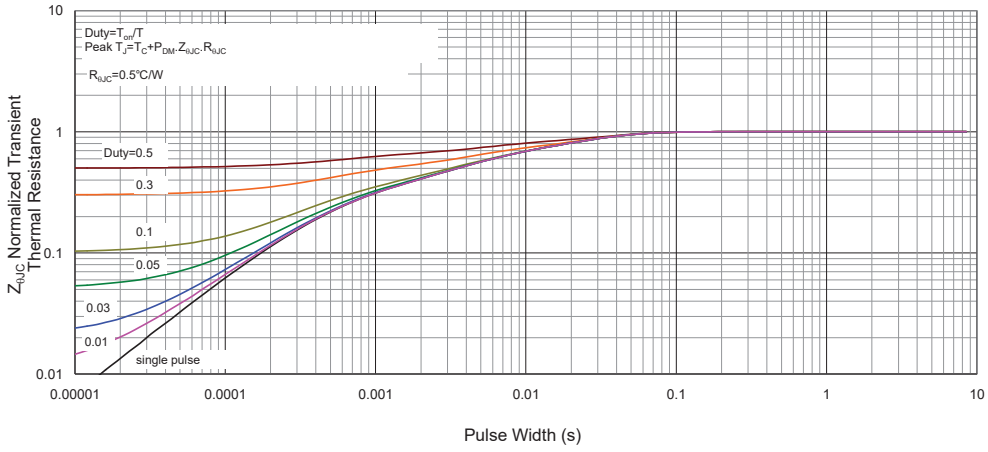

Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

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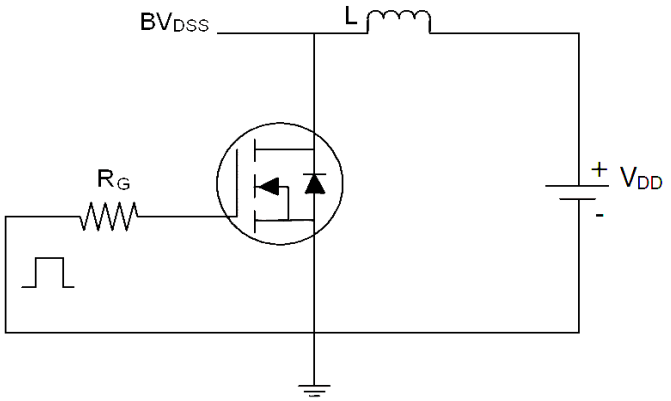
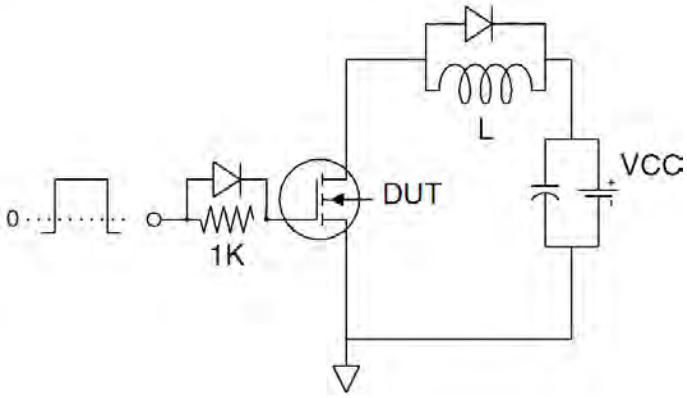
Test Circuit

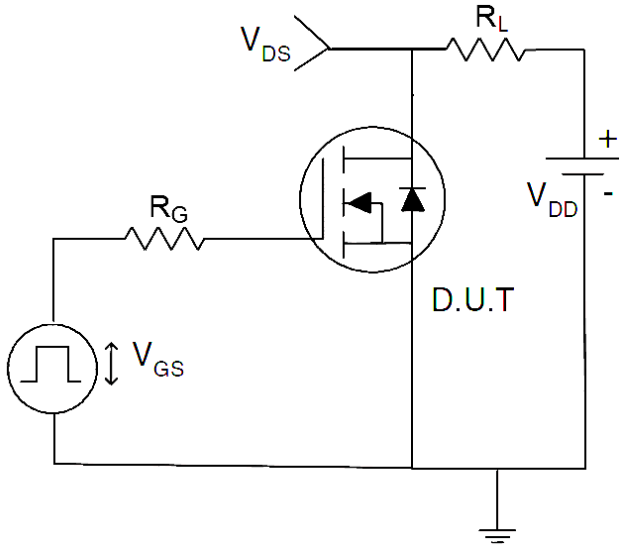
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



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Marking

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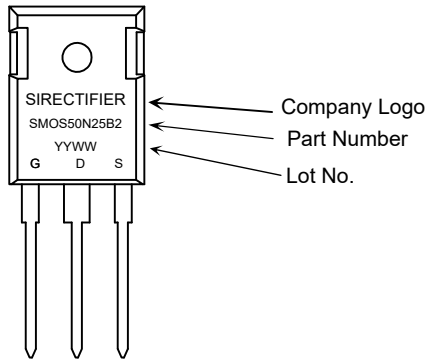

Ordering Information

Part Number	Package	Shipping	Marking Code
SMOS50N25B2	TO-247AD	30pcs / Tube	SMOS50N25B2

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