Description

EC65R85E N-channel Multi-Epi Super Junction MOSFETs

Features

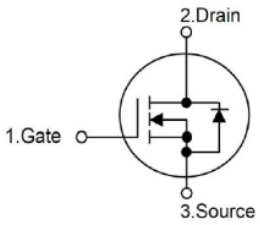
650V,5A
RDS(ON)=850mΩ@VGS=10V
New revolutionary high voltage technology
Better RDS(on) in TO-252
Ultra Low Gate Charge cause lower driving requirements
Periodic avalanche rated
Ultra low effective capacitances

Application

Switch Mode Power Supply（SMPS）
Uninterruptible Power Supply（UPS）
PFC stages for server & telecom
Consumer

RoHS

TO-252



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	TUBE (PCS)	Inner BOX (PCS)	Per Carton (PCS)
EC65R85E	EC65R85E	TAPING	TO-252	13inch	2500	25000

Absolute Maximum Ratings(Tc=25℃unlessotherwisespecified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		650	V
V_{GSS}	Gate-Source Voltage		±30	V
I_D	Continuous Drain Current	Tc=25℃	5	A
		Tc=100℃	2.5	A
I_{DM}	Pulsed Drain Current		18	A
E_{AS}	Single Pulsed Avalanche Energy		70	mJ
P_D	Power Dissipation	Tc=25℃	45	W
$R_{\theta JC}$	Thermal Resistance,Junction to Case		1.73	℃/W
T_J,T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics(T_J=25℃unlessotherwisespecified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V, V_{GS}=0V	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±30V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	3.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=2.5A	-	730	850	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=100V, V_{GS}=0V, f=1MHz	-	421	-	pF
C_{oss}	Output Capacitance		-	28	-	pF
C_{rss}	Reverse Transfer Capacitance		-	9	-	pF
Q_g	Total Gate Charge	V_{DD}=480V, I_D=2.5A, V_{GS}=10V	-	13.5	-	nC
Q_{gs}	Gate-Source Charge		-	3.0	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	3.7	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=400V, I_D=2.5A, R_{GEN}=25Ω	-	7.6	-	ns
t_r	Turn-on Rise Time		-	19.8	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	27.5	-	ns
t_f	Turn-off Fall Time		-	22.3	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=2.5A	-	0.8	1.2	V
trr	Body Diode Reverse Recovery Time	V_R=60V I_s=2.5A,dI/dt=100A/μs	-	175	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	1.08	-	uC
Irrm	Peak Reverse Recovery Current			14		A

Typical Performance Characteristics

Fig 1. Output Characteristics (Tj=25℃)

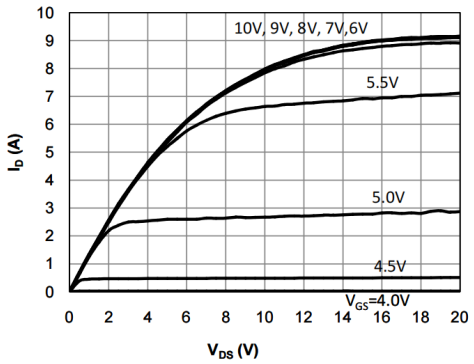


Fig 2. Output Characteristics (Tj=125℃)

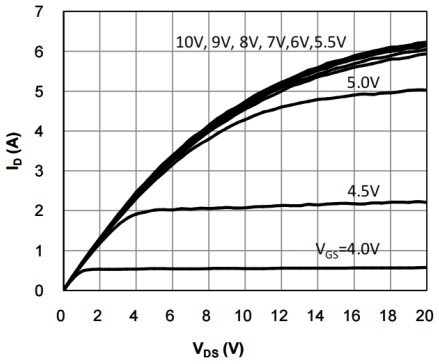


Fig 3: Transfer Characteristics

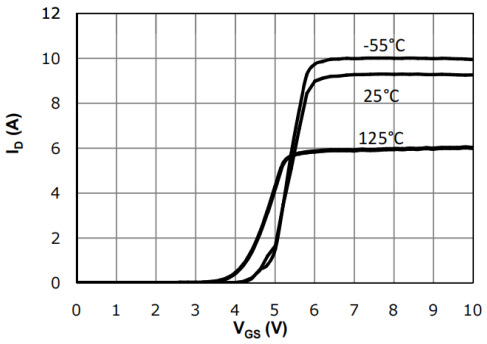


Fig 4: V_{TH} Vs Tj Temperature Characteristics

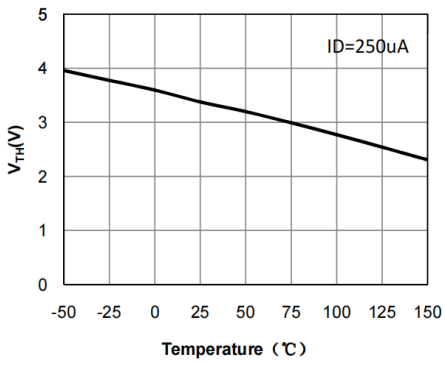


Fig 5: Rdson Vs Ids Characteristics(Tc=25℃)

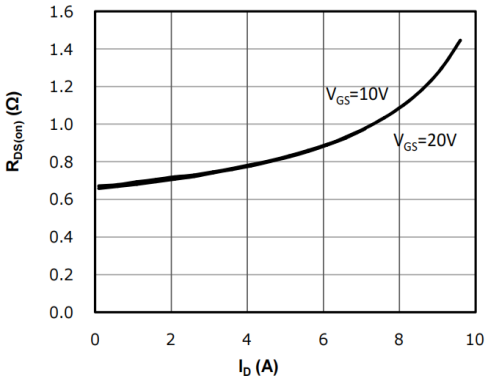


Fig 6: Rds(on) vs. Temperature

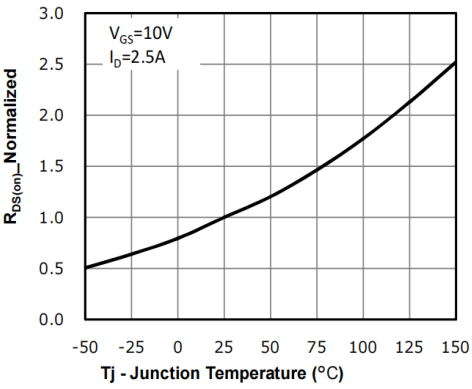


Fig 7: BVDSS vs. Temperature Characteristics

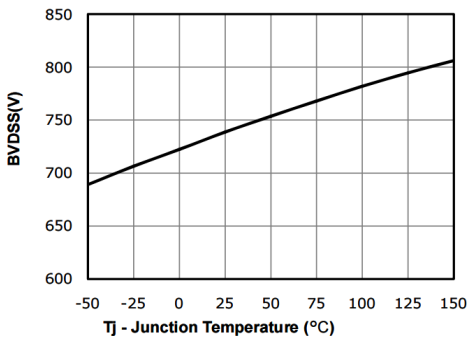


Fig 8: Rds(on) vs Gate Voltage

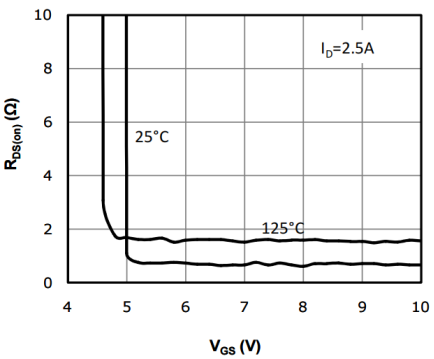


Fig 9: Body-diode Forward Characteristics

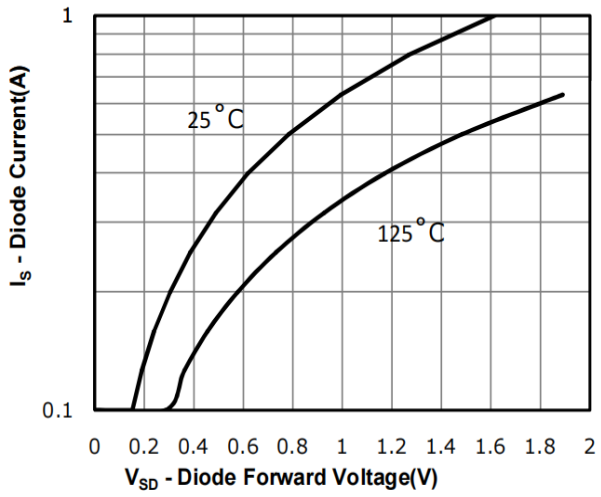


Fig 10: Gate Charge Characteristics

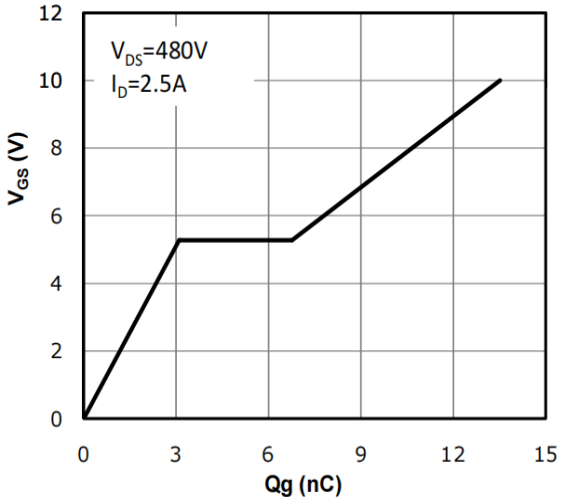


Fig 11: Capacitance Characteristics

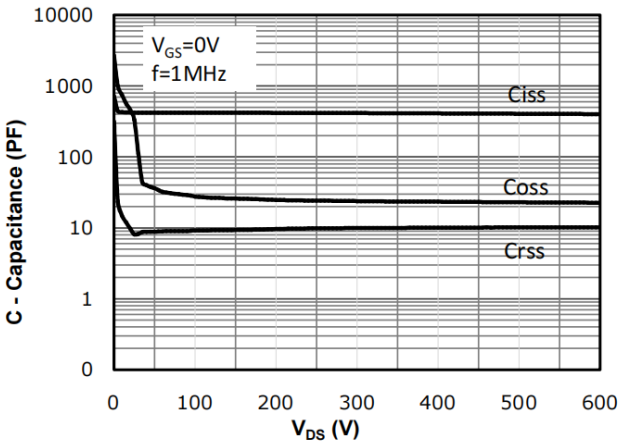


Fig 12: Safe Operating Area

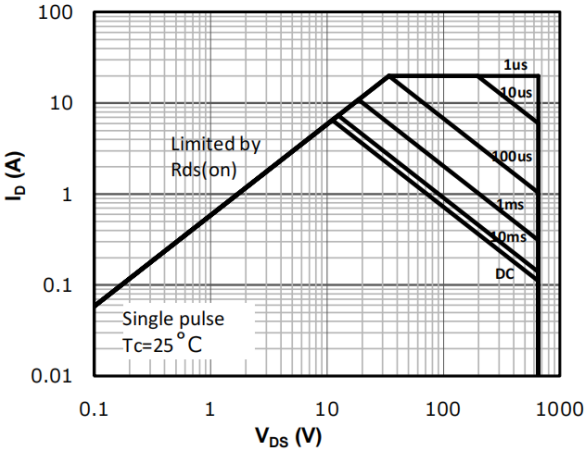
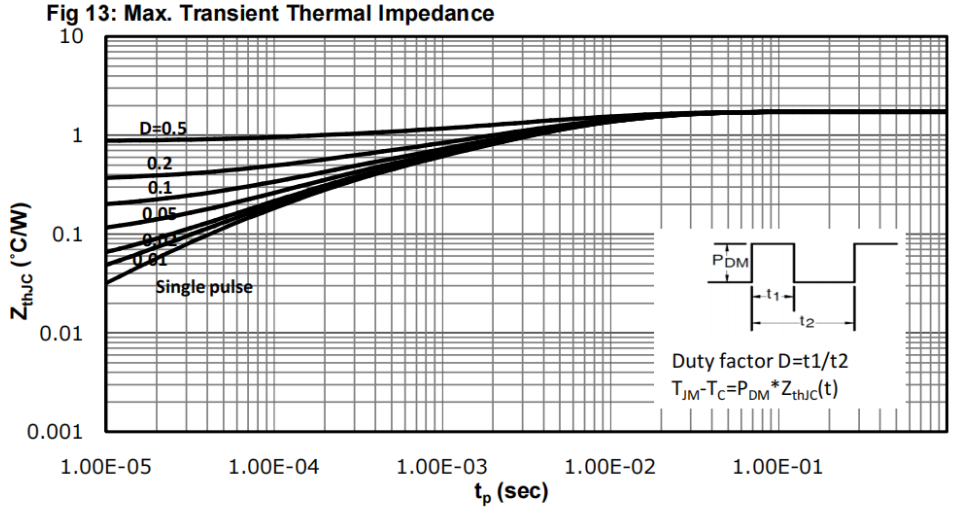


Fig 13: Max. Transient Thermal Impedance



Test Circuit

Figure A：Gate Charge Test Circuit and Waveform

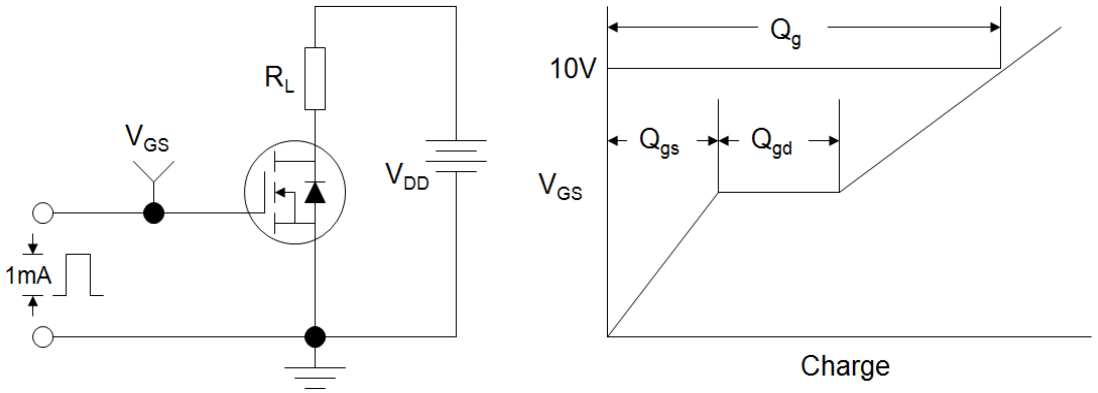


Figure B：Resistive Switching Test Circuit and Waveform

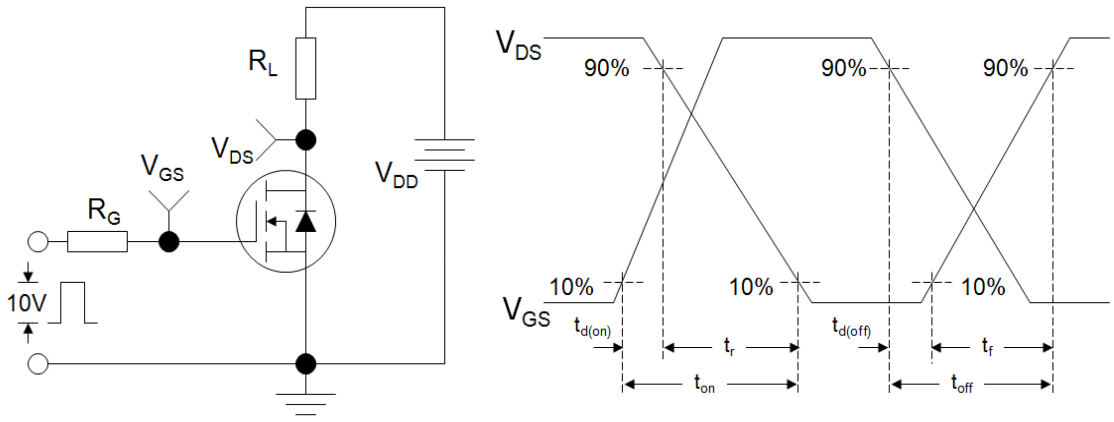
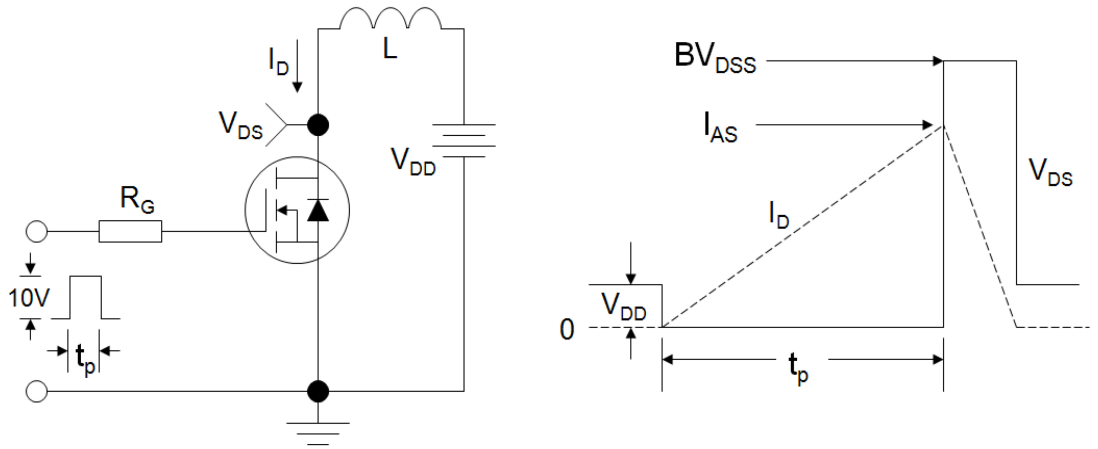
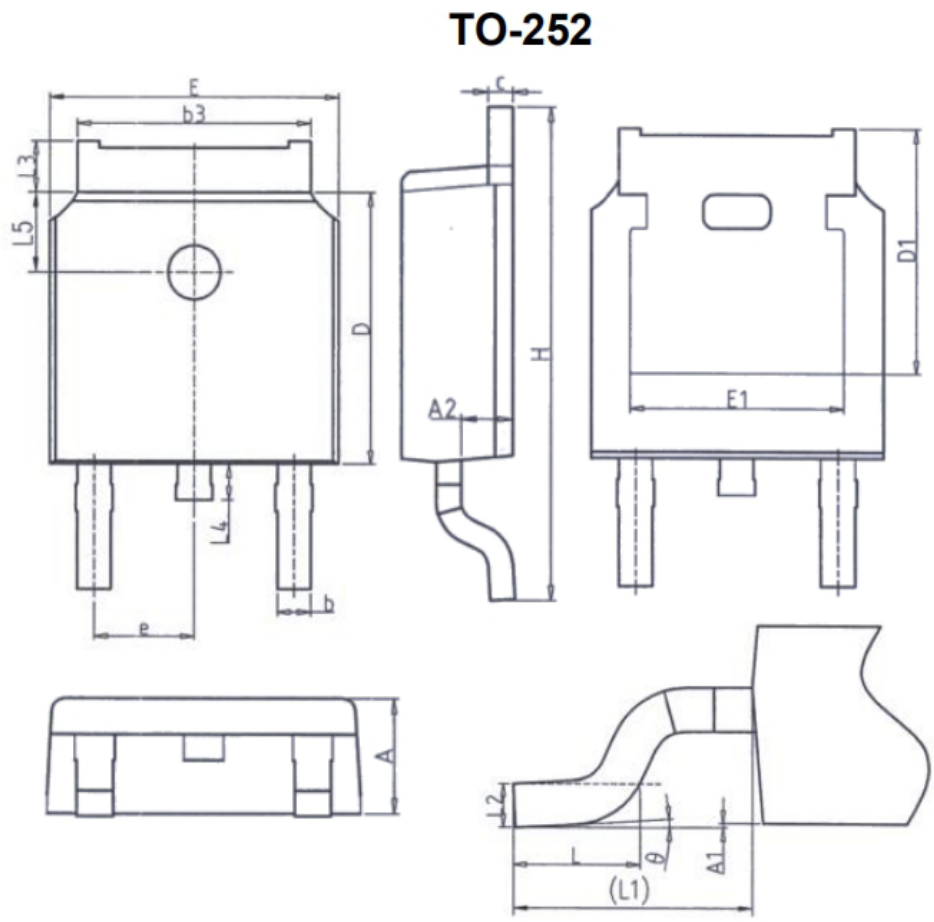


Figure C：Unclamped Inductive Switching Test Circuit and Waveform



Package Mechanical Data-TO-252



Unit: mm		
Symbol	Min.	Max.
A	2.20	2.40
A1	0.00	0.20
A2	0.97	1.17
b	0.68	0.90
b3	5.20	5.50
c	0.43	0.63
D	5.98	6.22
D1	5.30REF	
E	6.40	6.80
E1	4.63	-

Unit: mm		
Symbol	Min.	Max.
e	2.286BSC	
H	9.40	10.50
L	1.38	1.75
L1	2.90REF	
L2	0.51BSC	
L3	0.88	1.28
L4	-	1.00
L5	1.65	1.95
θ	0°	8°

Product Naming Rules