Description

EC65R65E N-channel Multi-Epi Super Junction MOSFETs

Features

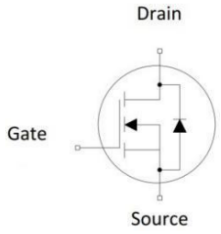
650V,7.0A
Very low FOM RDS(on)×Qg
100% UIS tested
RoHS compliant

Application

Power factor correction （PFC）
Switched mode power supplies （SMPS）
Uninterrupted power supply （UPS）

RoHS

TO-252



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	TUBE (PCS)	Inner BOX (PCS)	Per Carton (PCS)
EC65R65E	EC65R65E	TAPING	TO-252	13inch	2500	25000

Absolute Maximum Ratings (Tc=25℃unless otherwise specified)

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℃	7	A
		Tc=100℃	4.4	A
I_{DM}	Pulsed Drain Current		21	A
E_{AS}	Single Pulsed Avalanche Energy		120	mJ
P_D	Power Dissipation	Tc=25℃	63	W
$R_{\theta JC}$	Thermal Resistance,Junction to Case		2	℃/W
T_J,T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T_J=25℃unless otherwise specified)

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	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	2.5	-	4.0	V
$R_{DS(on)}$	Static Drain-Sourceon-Resistance	V_{GS}=10V,I_D=3.5A	-	560	650	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=100V, V_{GS}=0V, f=1MHz	-	493	-	pF
C_{oss}	Output Capacitance		-	32	-	pF
C_{rss}	Reverse Transfer Capacitance		-	1.6	-	pF
Q_g	Total Gate Charge	V_{DD}=520V, I_D=3.5A, V_{GS}=10V	-	13.3	-	nC
Q_{gs}	Gate-Source Charge		-	2.8	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	4.7	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=400V, I_D=3.5A, R_{GEN}=25Ω	-	11.6	-	ns
t_r	Turn-on Rise Time		-	23	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	53	-	ns
t_f	Turn-off Fall Time		-	35.8	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V,I_F=3.5A	-	0.85	-	V
trr	Body Diode Reverse Recovery Time	V_R=50V I_F=3.5A,dI/dt=100A/μs	-	201.4	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	1.3	-	uC

Typical Performance Characteristics

Figure 1. Output Characteristics

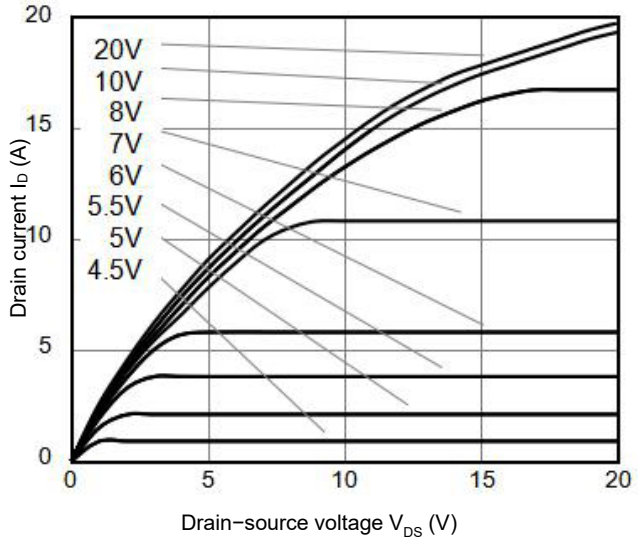


Figure 2. Transfer Characteristics

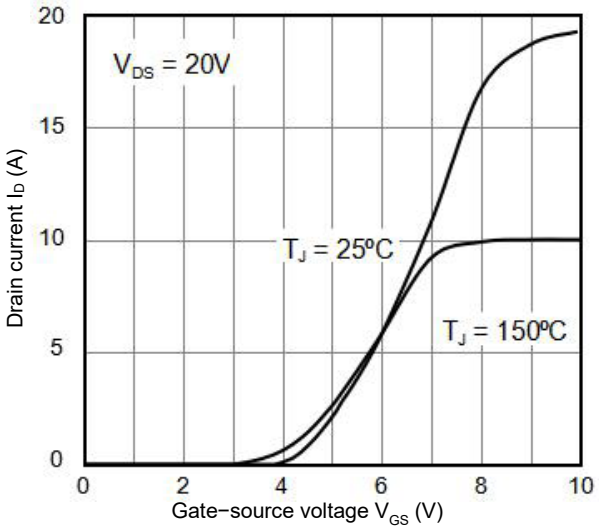


Figure 3. On-Resistance vs. Drain Current

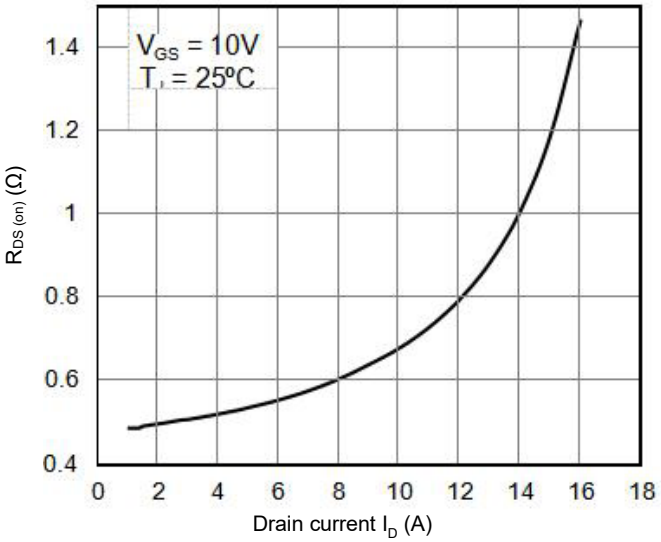


Figure 4. Capacitance Characteristics

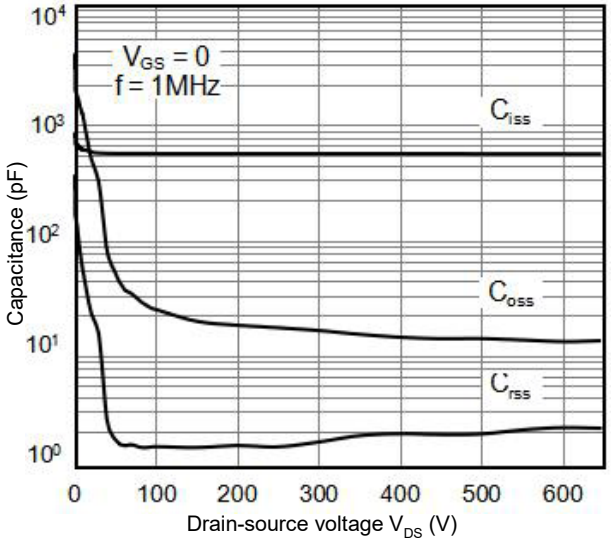


Figure 5. Gate Charge Characteristics

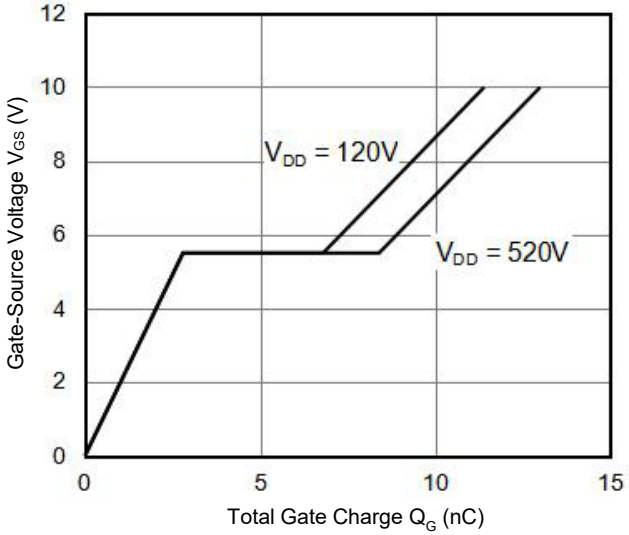


Figure 6. Body Diode Forward Voltage

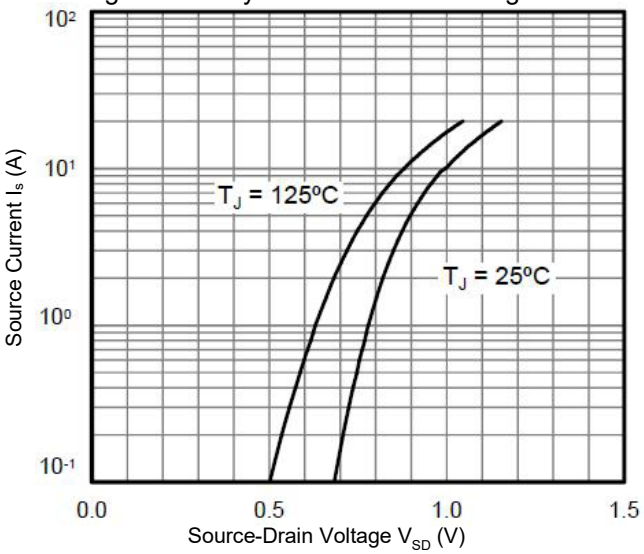


Figure 7. Breakdown Voltage vs. Temperature

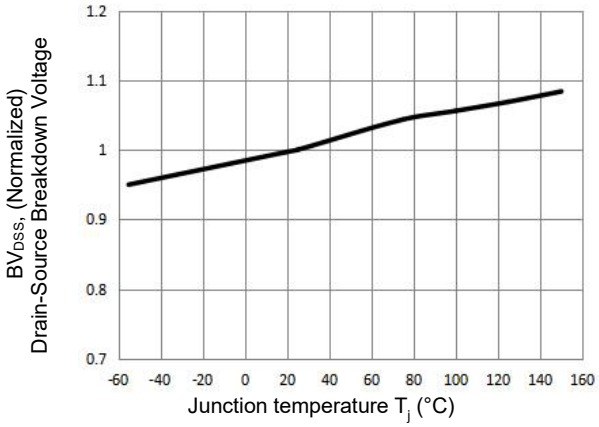


Figure 8. On-Resistance vs. Temperature

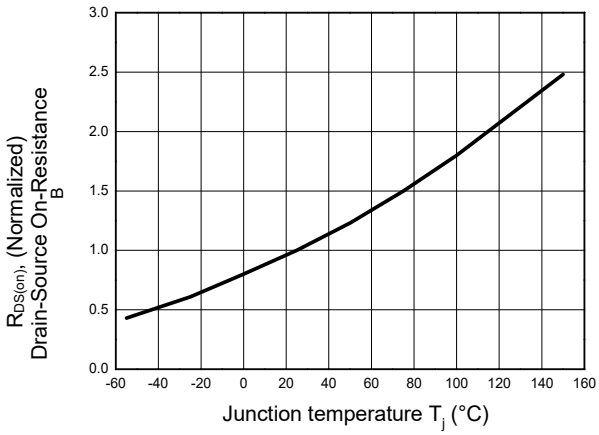


Figure 9. Maximum Safe Operating Area
TO-252/TO-251

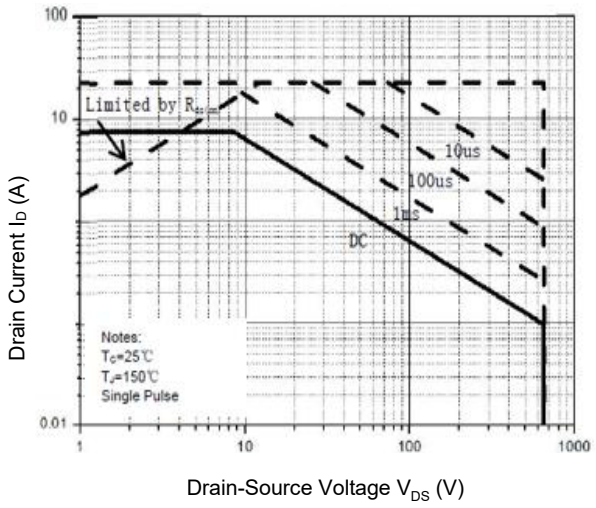
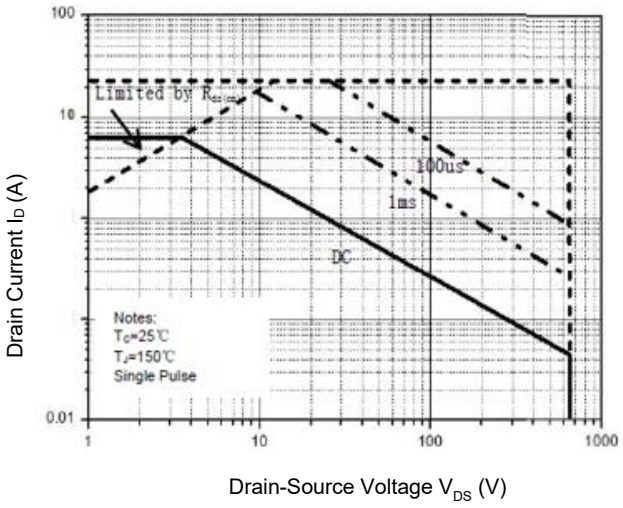
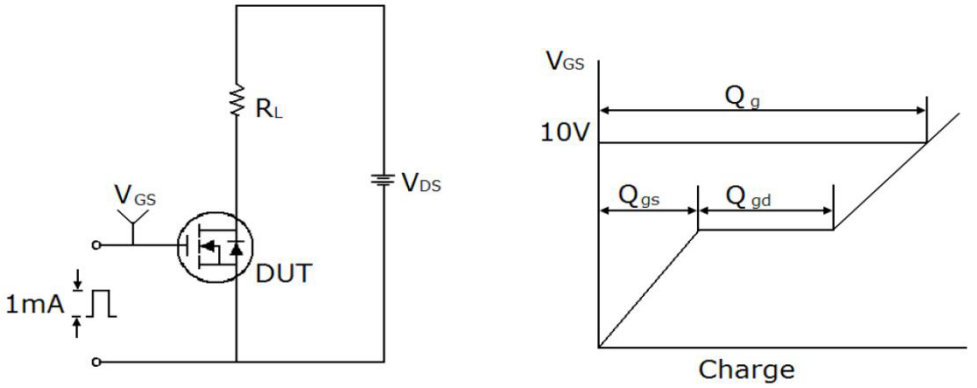


Figure 10. Maximum Safe Operating Area
TO-220F

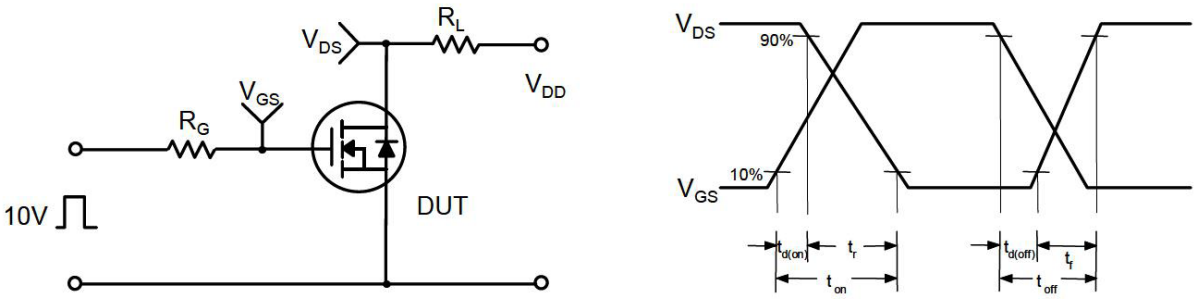


Test Circuit

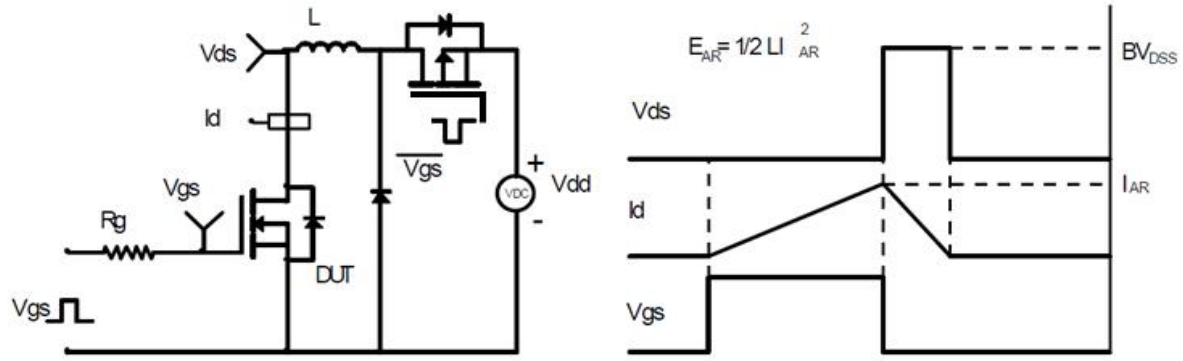
Gate Charge Test Circuit & Waveform



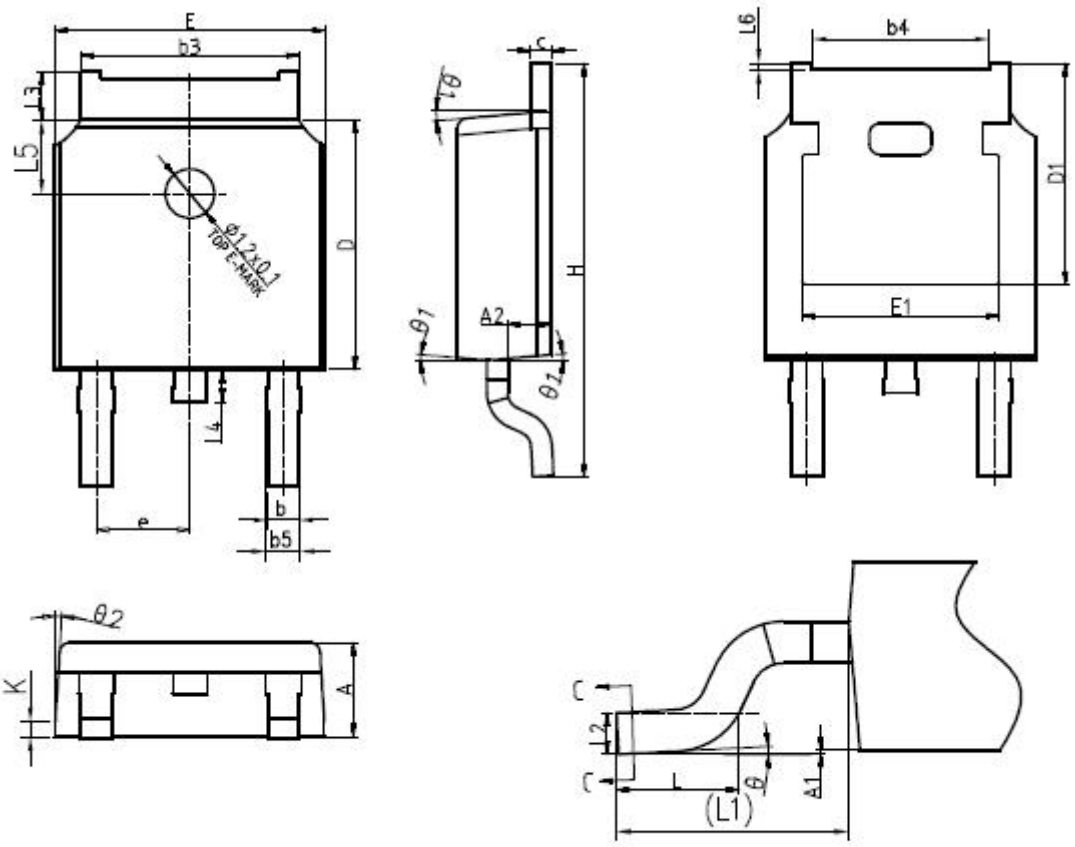
Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



Package Mechanical Data-TO-252



单位：mm

SYMBOL	mm		
	MIN	NOM	MAX
*A	2.20	2.30	2.38
*A1	0.00	–	0.10
A2	0.97	1.07	1.17
*b	0.72	0.78	0.85
b1	0.71	0.76	0.81
*b3	5.23	5.33	5.46
b4	4.27	4.32	4.37
b5	0.72	0.88	0.93
*c	0.47	0.53	0.58
c1	0.46	0.51	0.56
*D	6.00	6.10	6.20
D1	5.30REF		

*E	6.50	6.60	6.70
E1	4.70	4.83	4.92
*e	2.286BSC		
L	1.40	1.50	1.70
L1	2.90REF		
L2	0.51BSC		
*L3	0.90	–	1.25
*L4	0.60	0.80	1.00
L5	1.70	1.80	1.90
L6	0	0.047	0.123
θ	0°	–	8°
*θ1	5°	7°	9°
θ2	5°	7°	9°
K	0.40REF		

Product Naming Rules