P-Channel 30V(D-S) MOSFET

Product summary		
V_{DS}	-30	V
$R_{DS(ON)}$(at V_{GS}=-10V) Typ.	12	mΩ
$R_{DS(ON)}$(at V_{GS}=-4.5V) Typ.	20	mΩ
I_D(Tc=25℃)	-35	A

Features

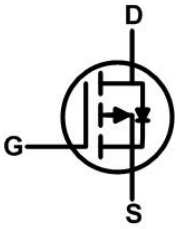
- Advanced Trench technology
- Low Gate Charge

Applications

- Load switching
- PWM Applications
- Power Management

Pin Configuration

TO-252



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECFA35P03	TO-252	13″	2500pcs

Absolute Maximum Ratings (at T_A=25℃ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	-35	A
		T_C=100℃	-22	A
I_{DM}	Pulse Drain Current Tested [A]		-140	A
E_{AS}	Single Pulse Avalanche Energy [B]		49	mJ
P_D	Power Dissipation	T_C=25℃	33	W
T_J,T_{STG}	Junciton and Storage Temperature Range		-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JC}$	Thermal Resistance-Junction to case max	3.8	℃/W

Electrical Characteristics (at T_J =25℃ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=-250uA	-30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V,V_{GS}=0V	--	--	-1	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±20V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250uA	-1.0	-1.5	-2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [C]	V_{GS}=-10V,I_D=-10A	--	12	15.5	mΩ
		V_{GS}=-4.5V,I_D=-8A	--	20	26.5	mΩ
V_{SD}	Diode Forward Voltage	I_S=-10A,V_{GS}=0V	--	--	-1.2	V
I_S	Continuous Source Current	V_G=V_D=0V, Force Current	--	--	-35	A
Dynamic Parameters [D]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=-15V f=1MHZ	--	920	--	pF
C_{oss}	Output Capacitance		--	173	--	pF
C_{rss}	Reverse Transfer Capacitance		--	148	--	pF
Q_g	Total Gate Charge	V_{DS}=-15V,I_D=-5A V_{GS}=0 to -10V	--	22	--	nC
Q_{gs}	Gate-Source Charge		--	3	--	nC
Q_{gd}	Gate-Drain Charge		--	5.8	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DD}=-15V I_D=-5A,V_{GS}=-10V, R_{GEN}=2.5Ω	--	9	--	ns
t_r	Turn-on Rise Time		--	13	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	50	--	ns
t_f	Turn-off Fall Time		--	20	--	ns
t_{rr}	Reverse recovery time	I_F=-5A, di/dt=100 A/uS	--	64	--	ns
Q_{rr}	Reverse recovery charge		--	25	--	nC

Note：

A. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

B. The EAS data shows Max. rating . The test condition is V_{DD}=-15V,V_G=-10V,L=0.5mH,I_{AS}=-14A,Rg=25Ω,T_J=25℃.

C. Pulse Test: Pulse Width≤300us,Duty cycle≤0.5%.

D. Guaranteed by design, not subject to production testing.

Typical Characteristics

Figure 1: Output Characteristics

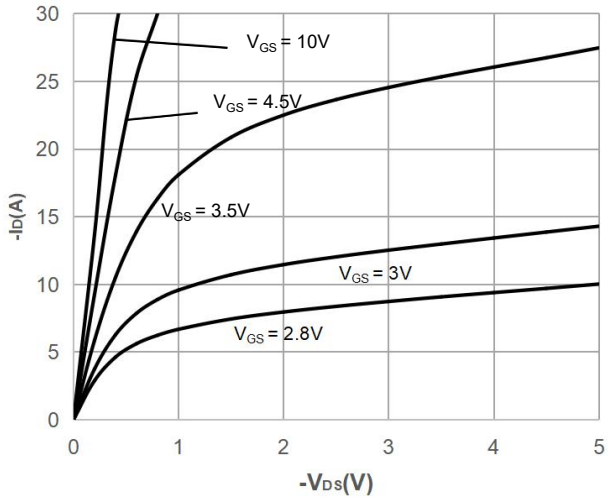


Figure 2: Typical Transfer Characteristics

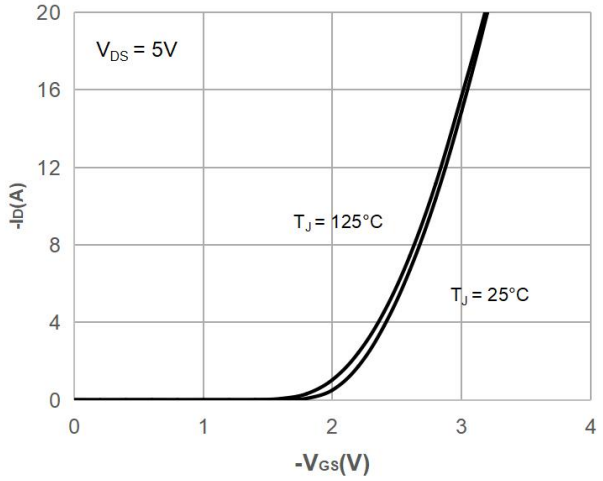


Figure 3: On-resistance vs. Drain Current

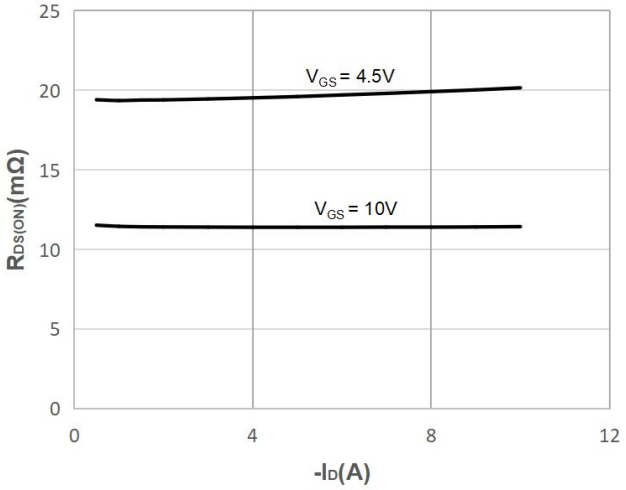


Figure 4: Body Diode Characteristics

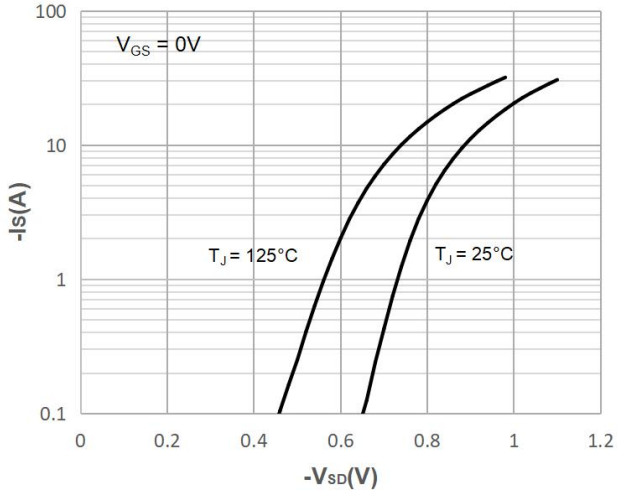


Figure 5: Gate Charge Characteristics

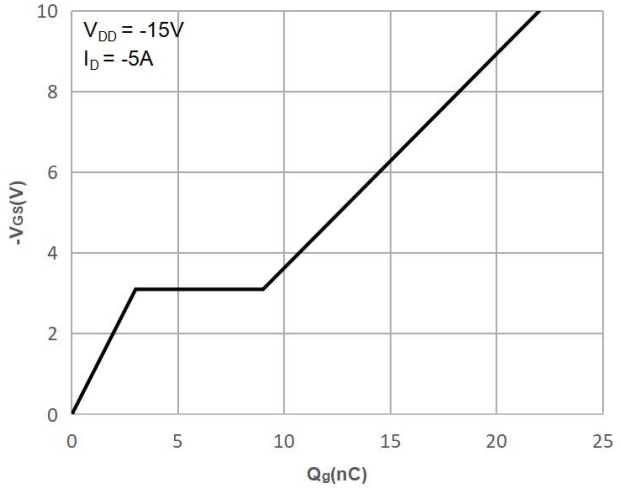
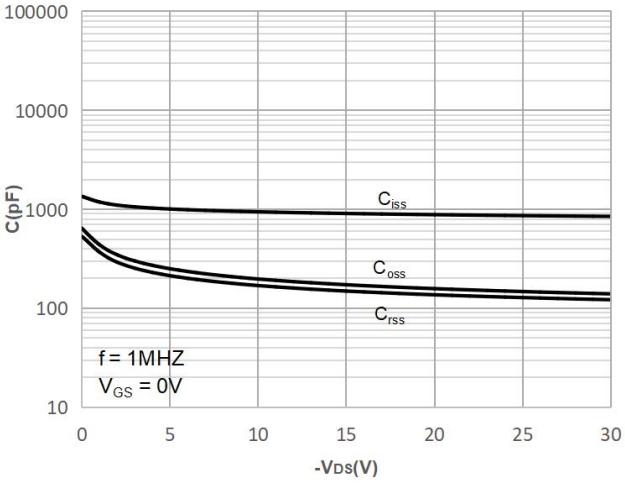


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

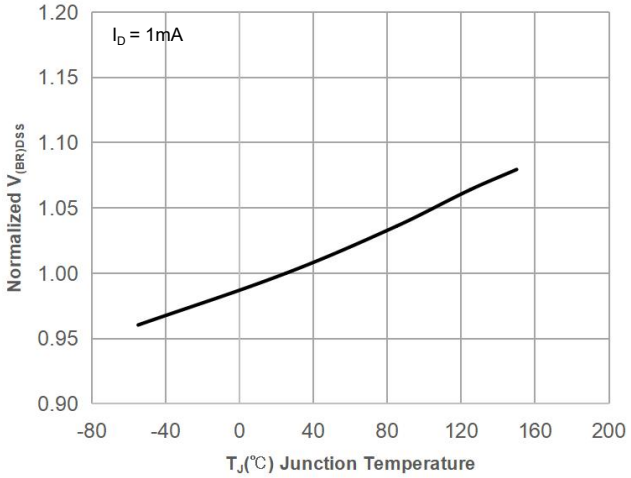


Figure 8: Normalized on Resistance vs. Junction Temperature

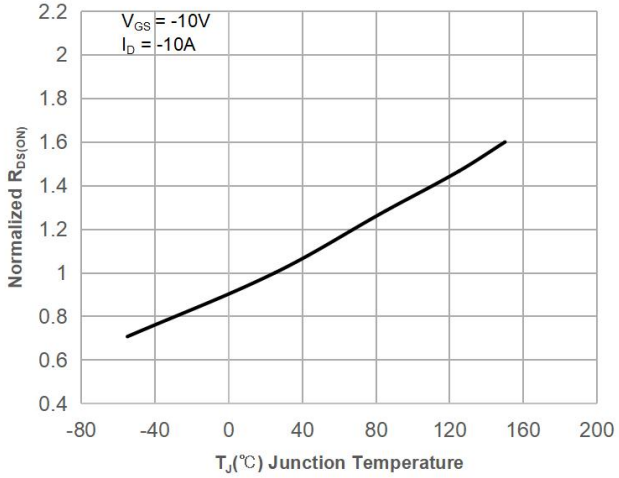


Figure 9: Maximum Safe Operating Area

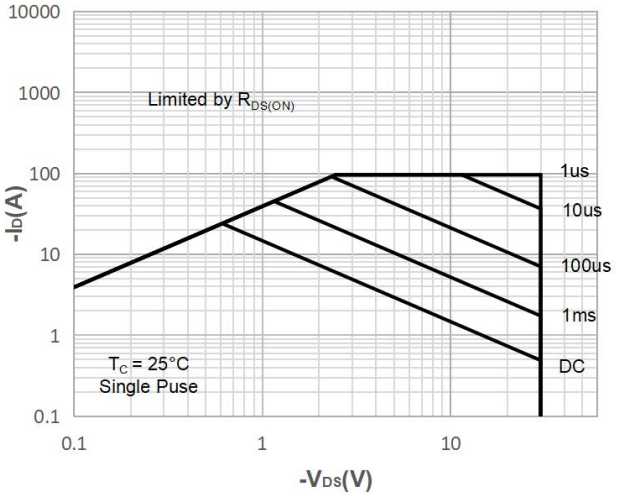


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

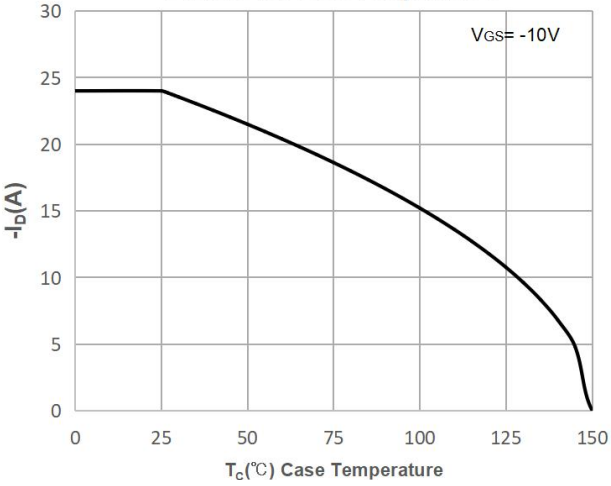


Figure 11: Normalized Maximum Transient Thermal Impedance

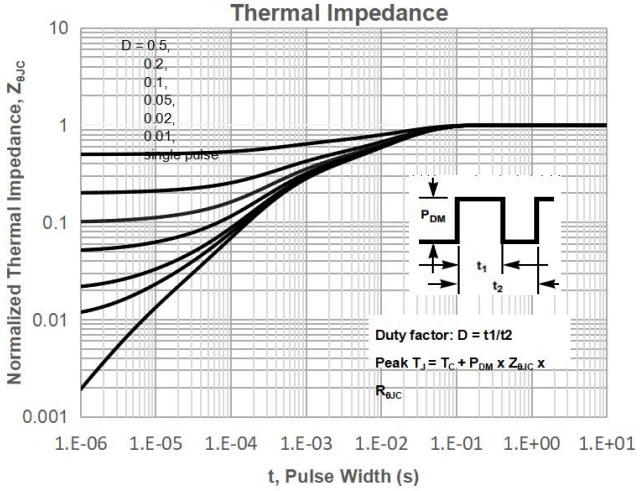
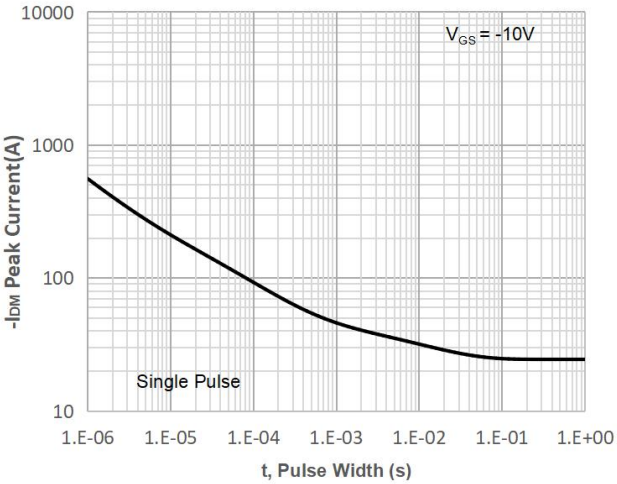


Figure 12: Peak Current Capacity



Test Circuit

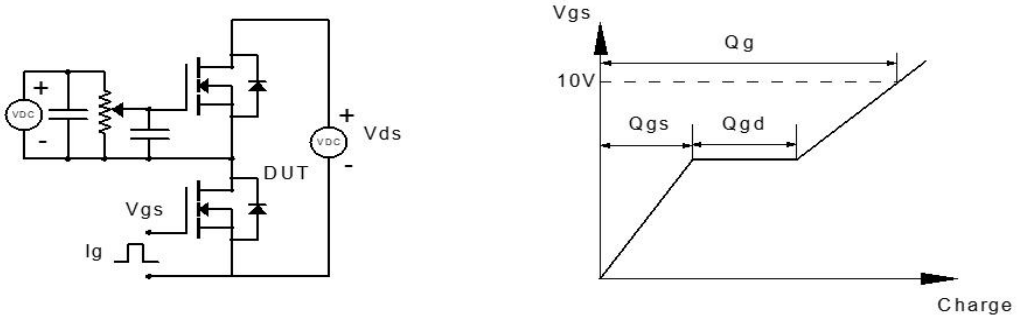


Figure 1: Gate Charge Test Circuit & Waveform

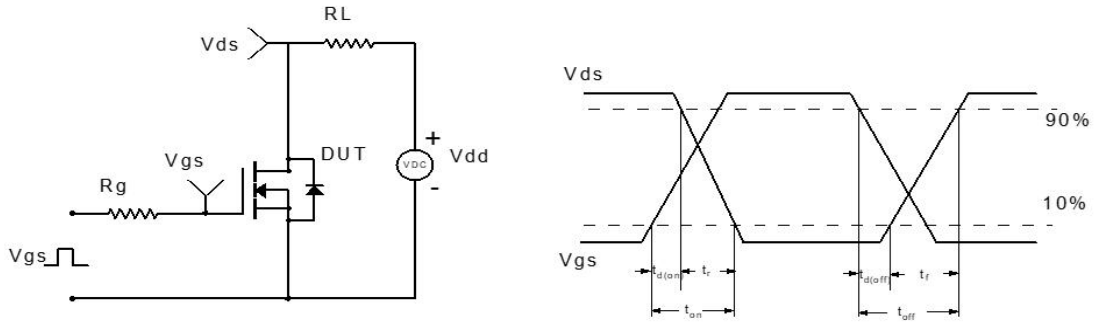


Figure 2: Resistive Switching Test Circuit & Waveform

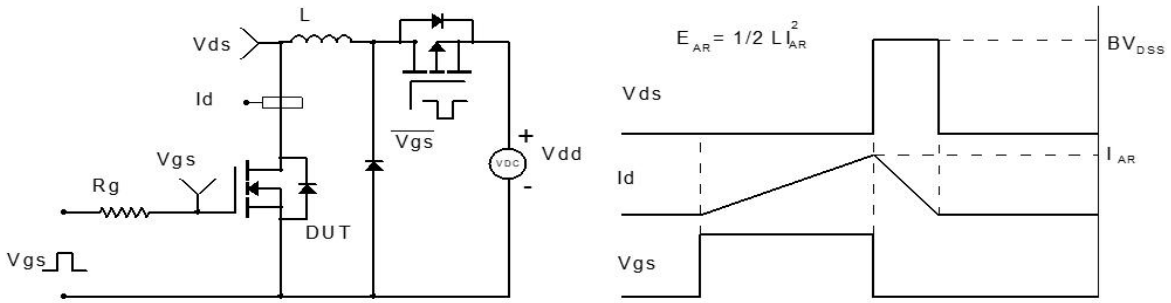


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

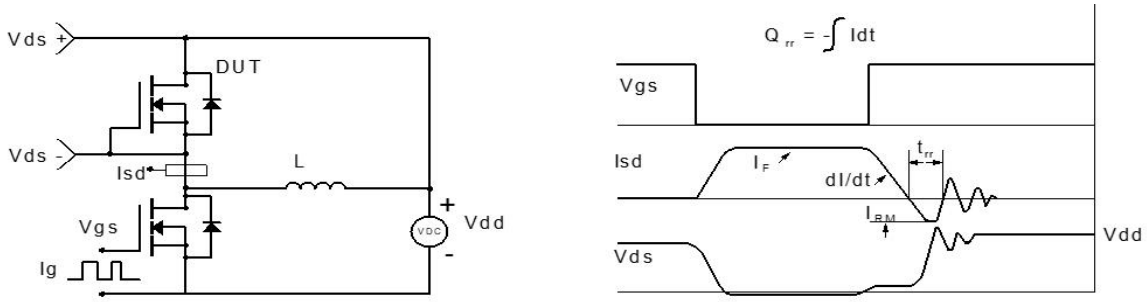
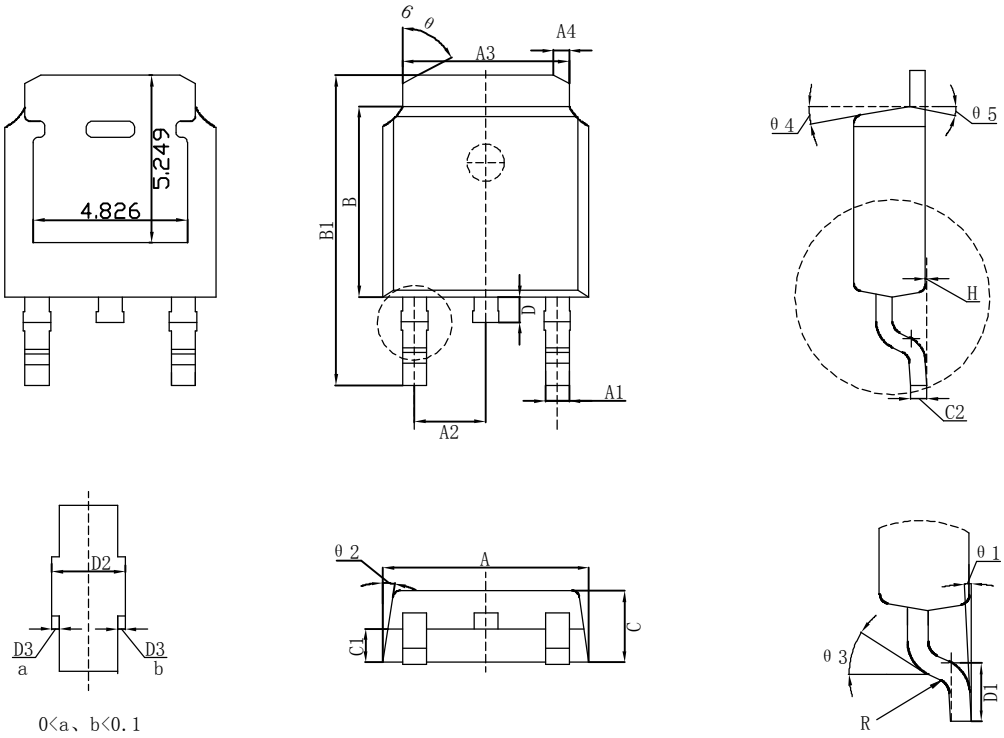


Figure 4: Diode Recovery Test Circuit & Waveform

TO-252 Package Information (unit:mm)



尺寸 / 标注	最小(mm)	最大(mm)	尺寸 / 标注	最小(mm)	最大(mm)
A	6.50	6.70	D1	1.40	1.60
A1	0.71	0.81	D2	0.81	0.91
A2	2.236	2.336	D3	0.05TYP	
A3	5.284	5.384	H	0.00	0.10
A4	0.75	0.85	R	0.40TYP	
B	6.00	6.20	θ1	0° ━ 8°	
B1	9.80	10.10	θ2	8.5° TYP4	
C	2.20	2.40	θ3	25° TYP	
C1	0.967	1.087	θ4	10° TYP2	
C2	0.498	0.518	θ5	10° TYP	
D	0.70	0.90	θ6	70° TYP	