N-Channel 55V(D-S) MOSFET

Product summary		
V_{DS}	55	V
$R_{DS(ON)}$(at V_{GS}=10V) Typ.	3.1	mΩ
$R_{DS(ON)}$(at V_{GS}=6V) Typ.	3.6	mΩ
I_D(Tc=25℃)	140	A

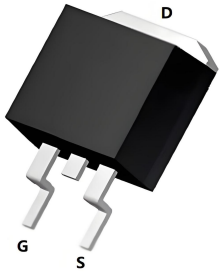
Features

- Low $R_{DS(ON)}$
- Fast Switching Characteristic
- Low Gate Charge

Applications

- High current load applications
- Load switching

Pin Configuration



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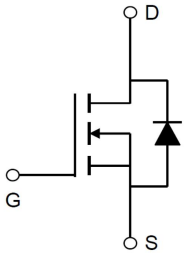


Packing Information

Device	Marking	Reel Size	Tape Width	Quantity
ECFC140N05S	D3D0N05	13″	24mm	800pcs

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

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		55	V
V_{GS}	Gate-Source Voltage		±30	V
I_D	Continuous Drain Current at V_{GS}=10V	T_C=25℃	140	A
		T_C=100℃	88	A
I_{DM}	Pulse Drain Current Tested [A]		476	A
E_{AS}	Single Pulse Avalanche Energy		800	mJ
P_D	Power Dissipation		156	W
T_J,T_{STG}	Junciton and Storage Temperature Range		-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient [B]	60	℃/W

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

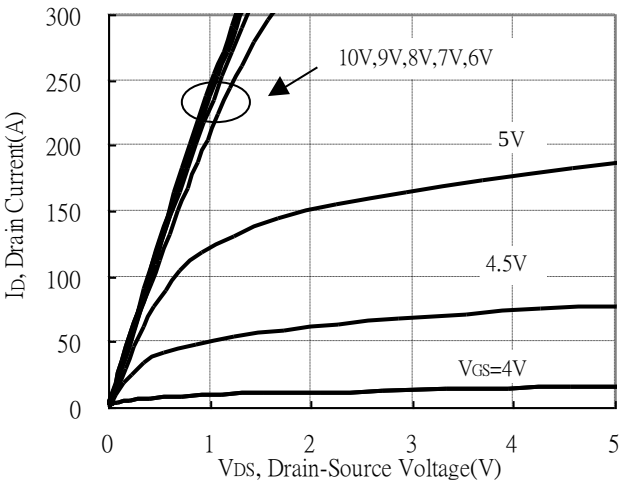
Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	55	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=50V,V_{GS}=0V	--	--	1	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±30V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.5	--	3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V,I_D=30A	--	3.1	4	mΩ
		V_{GS}=6V,I_D=20A	--	3.6	6	mΩ
V_{SD}	Forward Voltage	I_S=30A,V_{GS}=0V	--	--	1.2	V
I_S	Maximum Body-Diode Continuous Current		--	--	140	A
Dynamic Parameters						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=30V f=1MHZ	--	5681	--	pF
C_{oss}	Output Capacitance		--	485	--	pF
C_{rss}	Reverse Transfer Capacitance		--	255	--	pF
Switching Parameters						
Q_g	Total Gate Charge	V_{DS}=40V,I_D=30A V_{GS}=10V	--	126	--	nC
Q_{gs}	Gate-Source Charge		--	24	--	nC
Q_{gd}	Gate-Drain Charge		--	42	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DS}=30V，I_D=30A, R_{GEN}=1Ω, V_{GS}=10V	--	35.8	--	nS
t_r	Turn-on Rise Time		--	15.4	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	93.2	--	nS
t_f	Turn-off Fall Time		--	20.6	--	nS

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

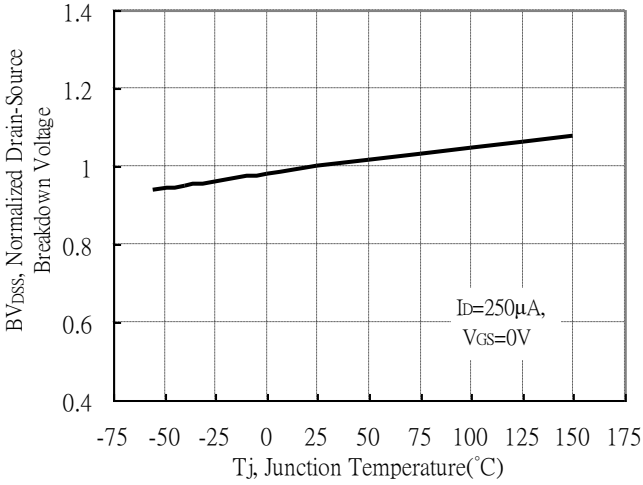
B. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper

Typical Characteristics

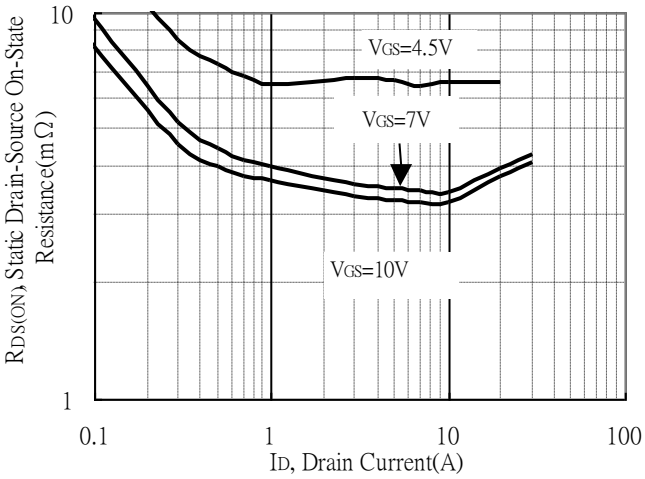
Typical Output Characteristics



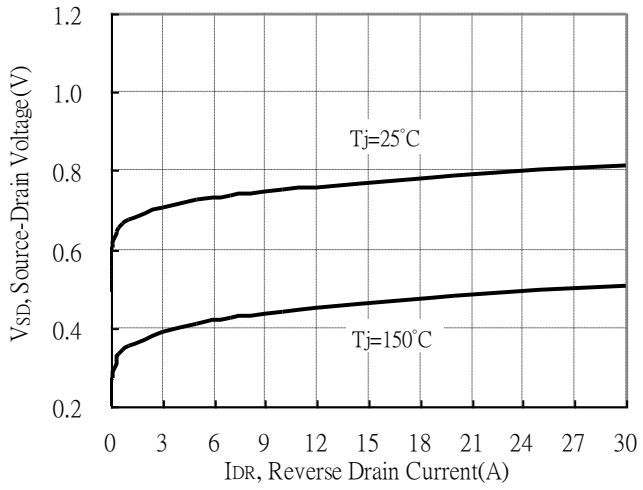
Brekdown Voltage vs Ambient Temperature



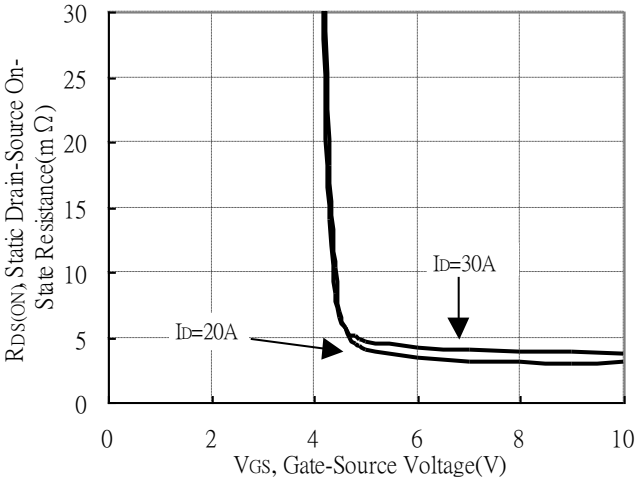
Static Drain-Source On-State resistance vs Drain Current



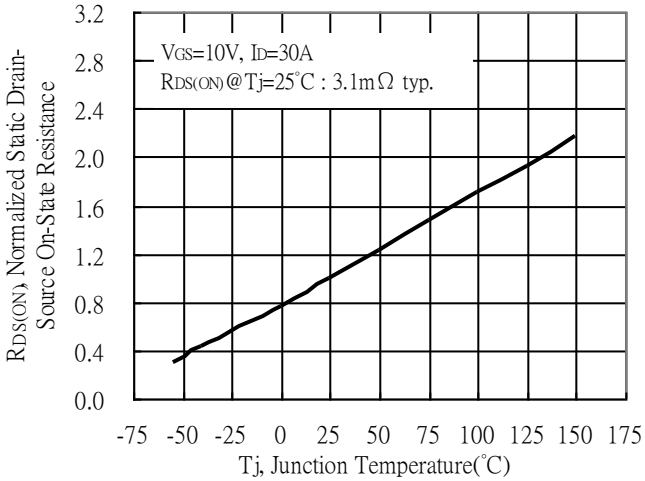
Reverse Drain Current vs Source-Drain Voltage



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

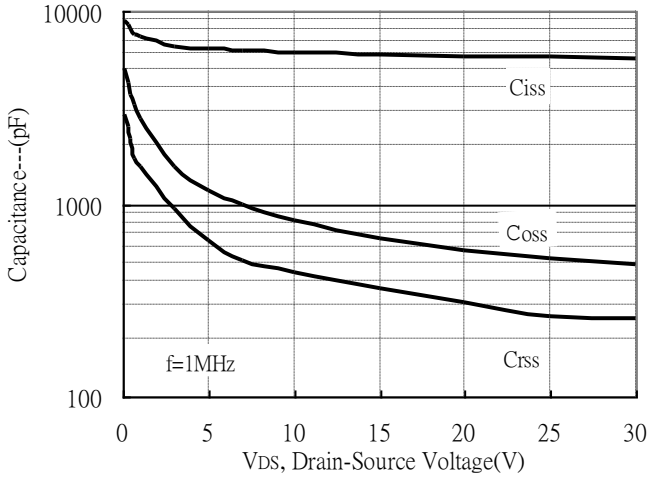


Drain-Source On-State Resistance vs Junction Tempearture

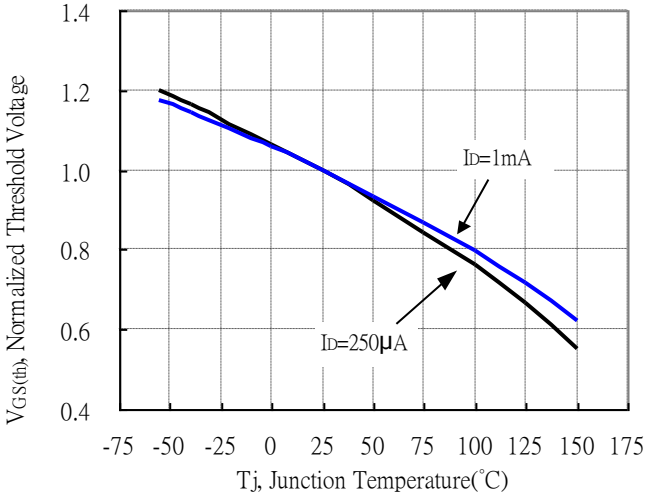


Typical Characteristics

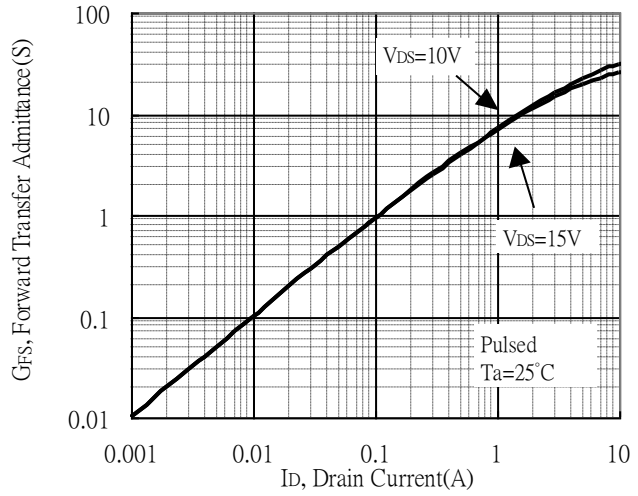
Capacitance vs Drain-to-Source Voltage



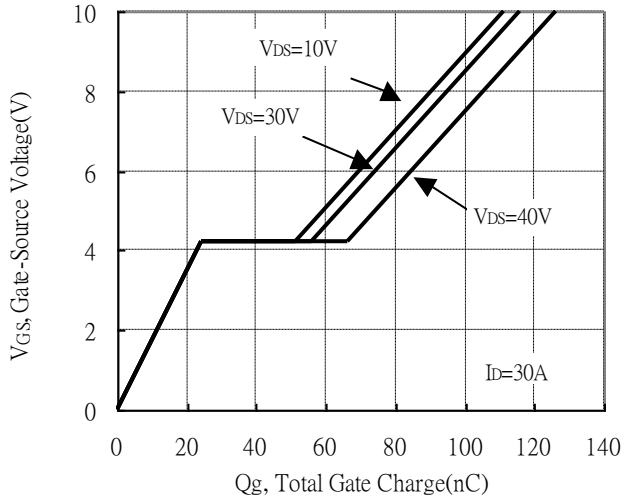
Threshold Voltage vs Junction Tempearture



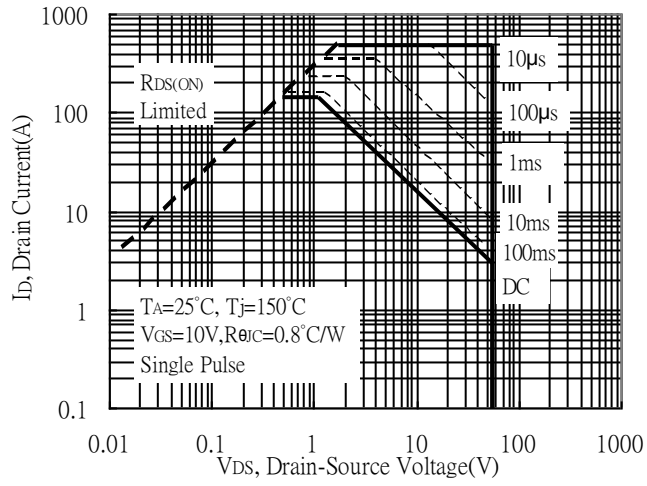
Forward Transfer Admittance vs Drain Current



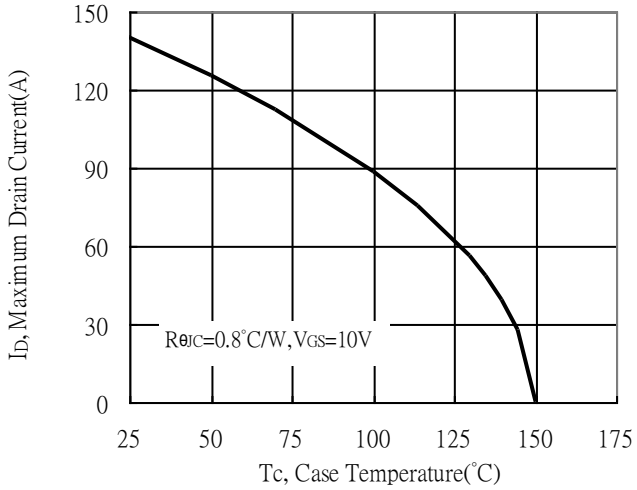
Gate Charge Characteristics



Maximum Safe Operating Area

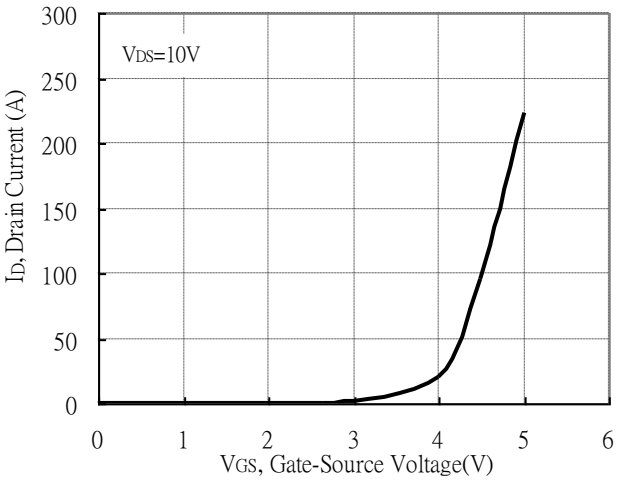


Maximum Drain Current vs Case Temperature

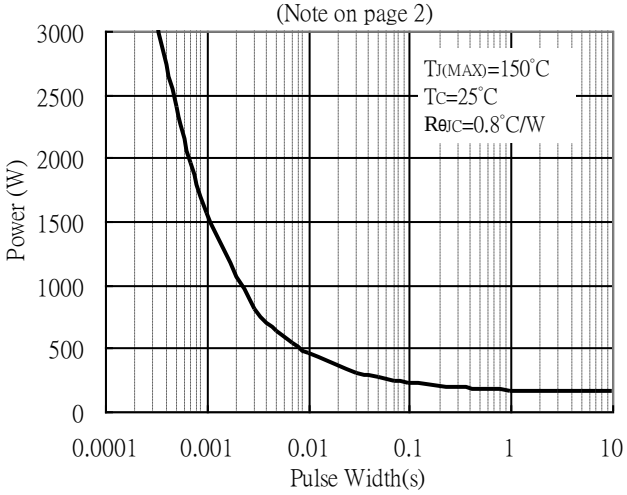


Typical Characteristics

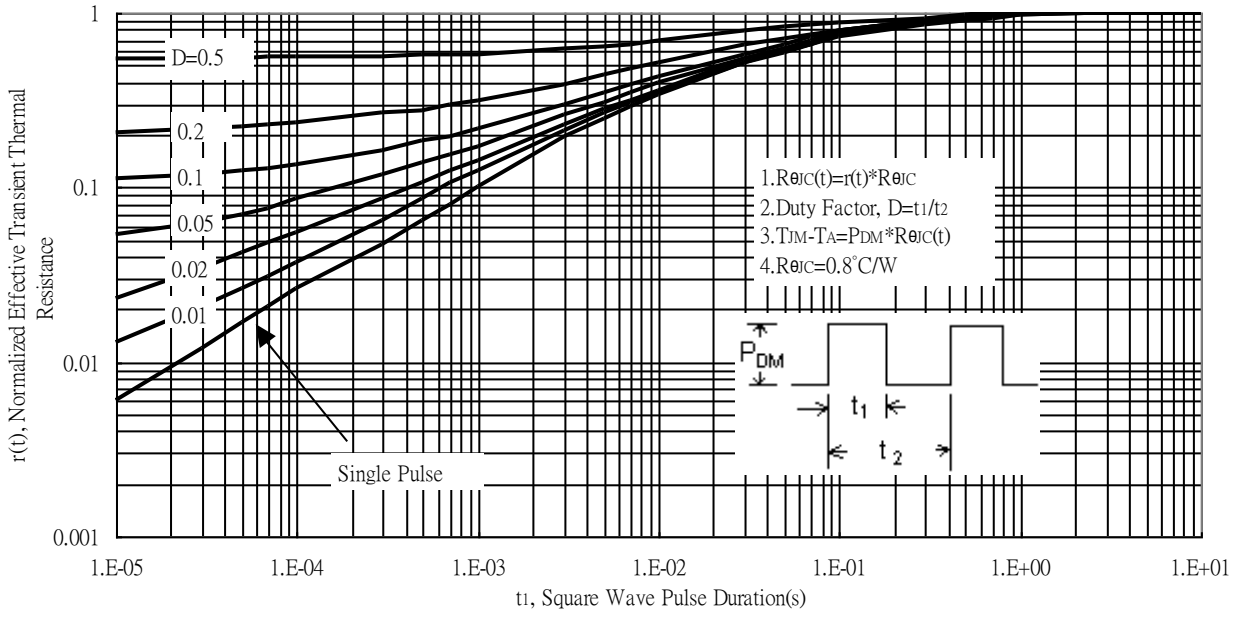
Typical Transfer Characteristics



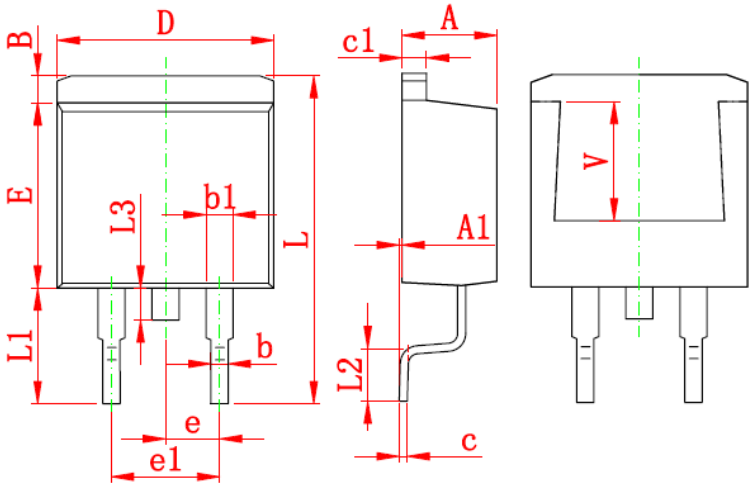
Single Pulse Power Rating, Junction to Case
(Note on page 2)



Transient Thermal Response Curves



TO-263 Package Information



*:Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184	E	8.500	8.900	0.335	0.350
A1	0.000	0.150	0.000	0.006	e	*2.540		*0.100	
B	1.170	1.370	0.046	0.054	e1	4.980	5.180	0.196	0.204
b	0.710	0.910	0.028	0.036	L	15.050	15.450	0.593	0.608
b1	1.170	1.370	0.046	0.054	L1	5.080	5.480	0.200	0.216
c	0.310	0.530	0.012	0.021	L2	2.340	2.740	0.092	0.108
c1	1.170	1.370	0.046	0.054	L3	1.300	1.700	0.051	0.067
D	10.010	10.310	0.394	0.406	V	5.600 REF		0.220 REF	

Notes : 1.Controlling dimension : millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

Material :

- Lead : Pure tin plated.
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0.