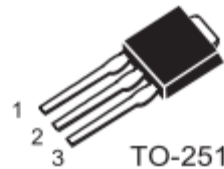
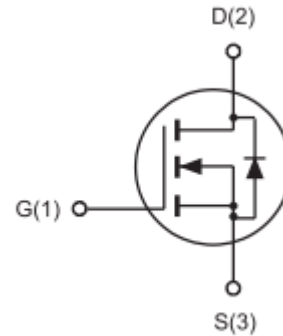


Features

- ◆ 700V, 4A, $R_{DS(ON)}$ (Max.) = 2.7Ω @ $V_{GS} = 10V$
- ◆ Low C_{rss}
- ◆ Fast Switching
- ◆ 100 % Avalanche Tested

Applications

- ◆ Charger
- ◆ Standby Power.



ABSOLUTE MAXIMUM RATINGS (Tc = 25°C unless otherwise noted)

Symbol	Parameter	Limit		Unit
		TO-220F	TO-251	
V _{DS}	Drain-Source Voltage ^a	700		V
V _{GS}	Gate-Source Voltage	± 30		V
I _D	Drain Current-Continuous, T _c =25°C	4		A
	Drain Current-Continuous, T _c =100°C	2.53		A
I _{DM}	Drain Current-Pulsed ^b	16		A
P _D	Maximum Power Dissipation @ T _J =25°C	35	54.3	W
EAS	Single Pulsed Avalanche Energy ^e	242		mJ
T _J , T _{STG}	Operating and Store Temperature Range	-55 to 150		°C

Thermal Characteristics

Symbol	Parameter	Value		Unit
		TO-220F	TO-251	
R _{θ Jc}	Thermal Resistance, Junction-Case Max.	3.79	2.3	°C/W

Electrical Characteristics (T_J = 25°C unless otherwise noted)

■ Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	700	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 700V, V _{GS} = 0V	-	-	1	μA
I _{GSSF}	Forward Gate Body Leakage	V _{DS} = 0V, V _{GS} = 30V	-	-	100	nA
I _{GSSR}	Reverse Gate Body Leakage Current	V _{DS} = 0V, V _{GS} = -30V	-	-	-100	nA

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2.0	2.99	4.0	V
R _{DS(on)}	Static Drain-Source On-Resistance ^d	V _{GS} = 10V, I _D = 2A	-	2.41	2.7	Ω

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
C _{iss}	Input Capacitance	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz	-	582	-	pF
C _{oss}	Output Capacitance		-	89	-	pF
C _{rss}	Reverse Transfer Capacitance		-	16	-	pF

■ Switching Characteristics

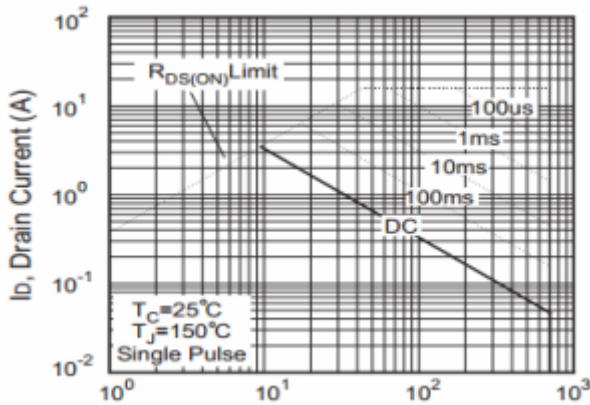
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
t _{d(on)}	Turn-On Delay Time	V _{DD} = 350V, I _D = 4A, R _G = 10Ω, V _{GS} = 10V	-	23.3	-	ns
t _r	Turn-On Rise Time		-	9.3	-	ns
t _{d(off)}	Turn-Off Delay Time		-	30.4	-	ns
t _f	Turn-Off Fall Time		-	7.9	-	ns
Q _g	Total Gate Charge	V _{DS} = 350V, I _D = 4A, V _{GS} = 10V	-	9.9	-	nC
Q _{gs}	Gate-Source Charge		-	3.8	-	nC
Q _{gd}	Gate-Drain Charge		-	3.4	-	nC

■ Drain-Source Diode Characteristics

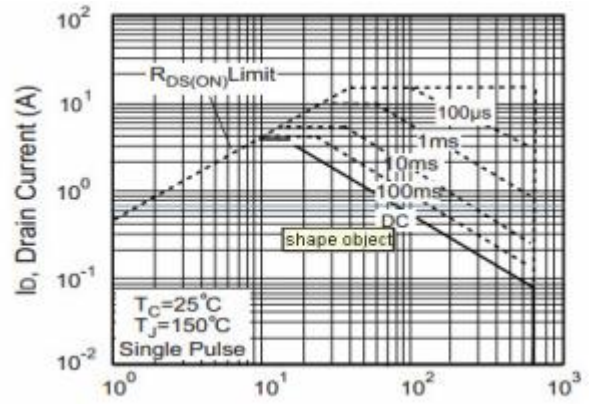
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
IS	Drain-Source Diode Forward Continuous Current	VGS = 0V	-	-	4	A
ISM	Maximum Pulsed Current	VGS = 0V	-	-	16	A
VSD	Drain-Source Diode Forward Voltage	VGS = 0V, IS = 4A	-	0.81	1.4	V

Notes :

- a. $T_J = +25\text{ C to }+150\text{ C}$.
- b. Repetitive rating; pulse width limited by maximum junction temperature.
- c. $I_{SD} = 4.0\text{A}$ $di/dt \leq 100\text{ A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, $T_J \leq +150\text{ C}$.
- d. Pulse width $\leq 300\ \mu\text{s}$; duty cycle $\leq 2\%$.
- e. $L=30\text{mH}$, $V_{DD} = 100\text{V}$, $I_{AS} = 3.72\text{A}$, $R_G = 25\Omega$ Starting $T_J = 25\text{ }^\circ\text{C}$.



V_{DS}, Drain-Source Voltage (V) for EC744N70AR
Figure 1-1 Maximum Safe Operating Area



V_{DS}, Drain-Source Voltage (V) for EC744N70A3R
Figure 1-2 Maximum Safe Operating Area

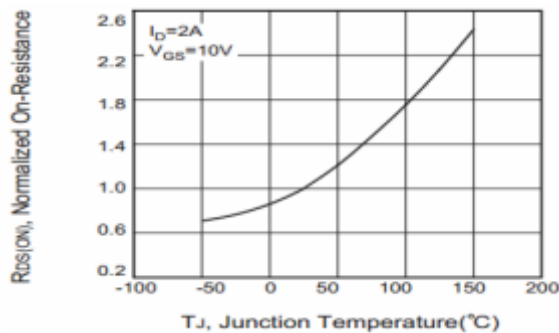


Figure 2. Normalized On-Resistance Variation with Temperature

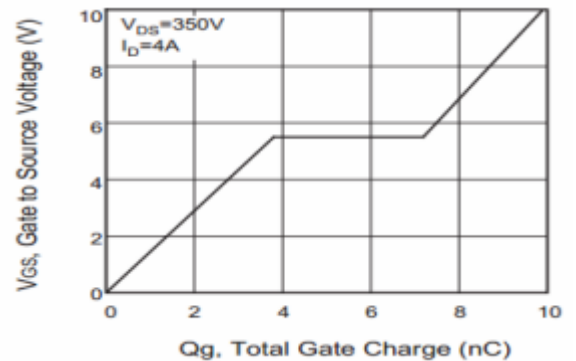


Figure 3. Gate Charge Characteristics

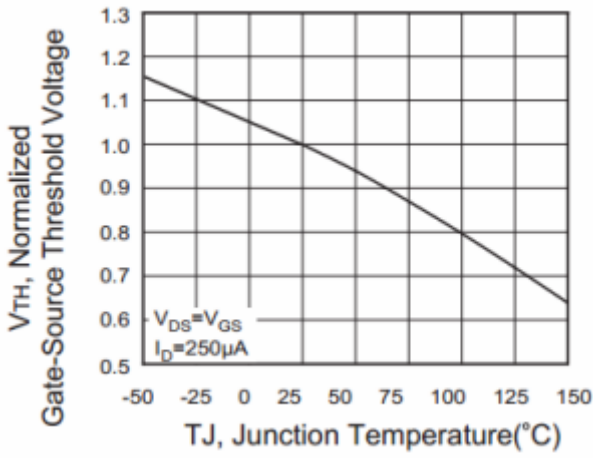


Figure 4. Gate Threshold Variation With Temperature

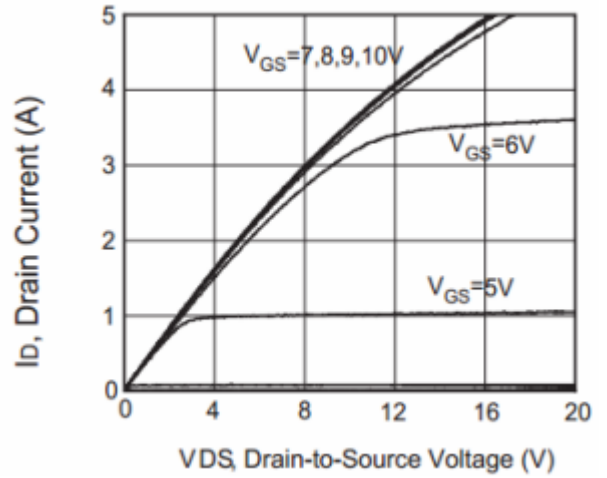


Figure 5. On-state Characteristics

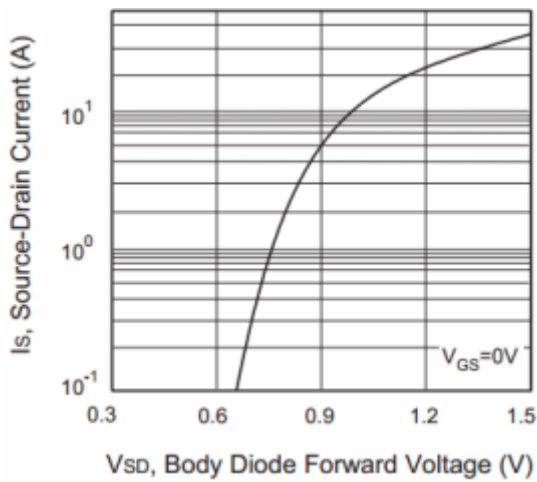


Figure 6. Body Diode Forward Voltage Variation with Source Current

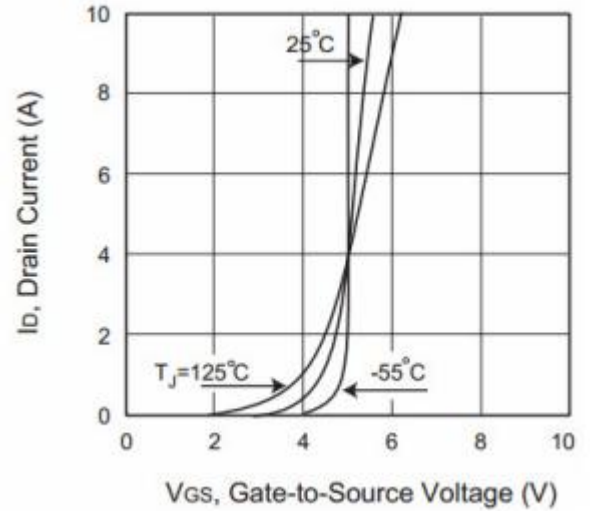


Figure 7. Transfer Characteristics

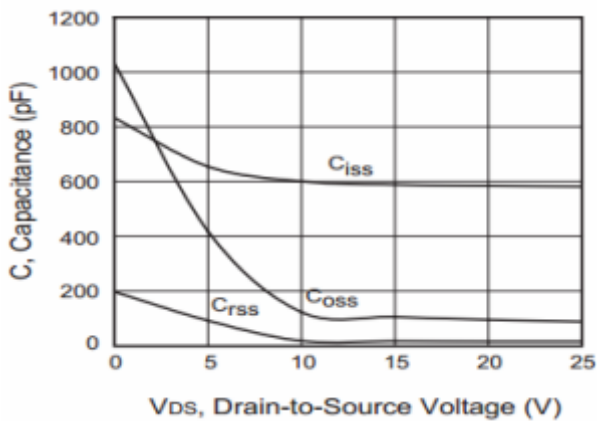
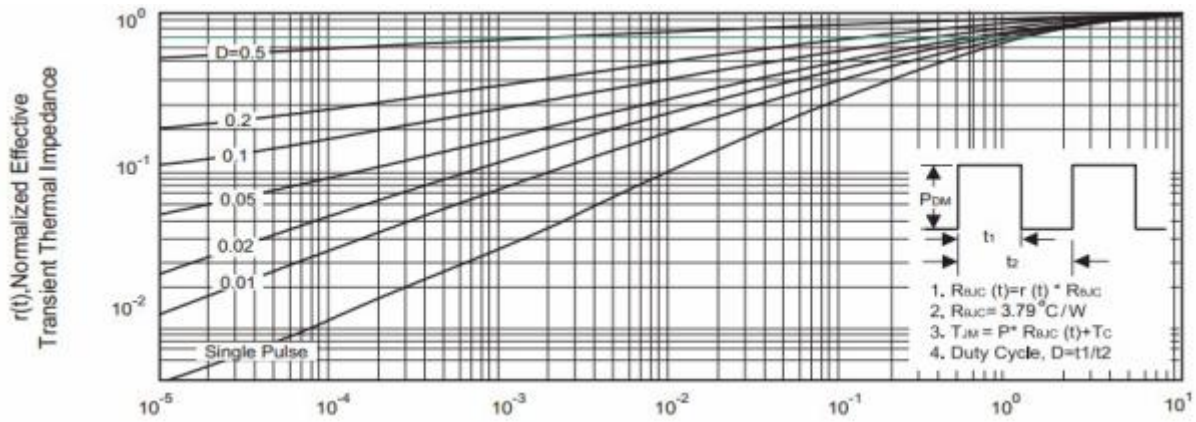
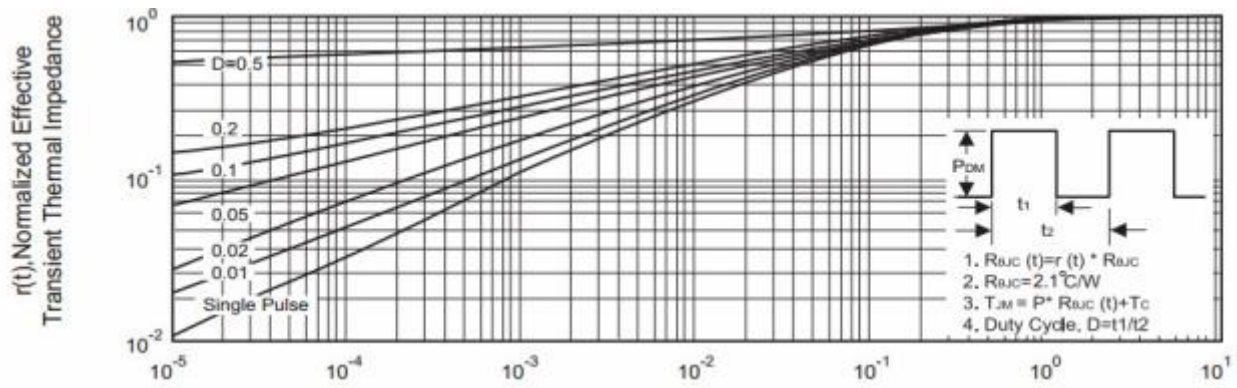


Figure 8. Capacitance Characteristics



Square Pulse Duration (sec) for EC744N70AR

Figure 9-1. Normalized Effective Transient Thermal Impedance With Pulse Duration



Square Pulse Duration (sec) for EC744N70A3R

Figure 9-2. Normalized Effective Transient Thermal Impedance With Pulse Duration

ORDERING INFORMATION

Part Number	Package	Marking	Marking Information
EC744N70AR	TO-220F-3L	744N70 LLLLL YYWW	1. LLLLL : Lot No. 2. YY : Year code 3. WW : Week code
EC744N70A3R	TO-251-3L		