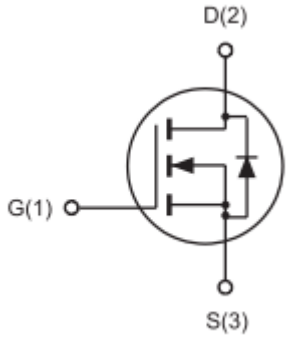
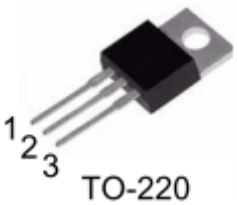
Features

- 600V, 5A, $R_{DS(ON)}$(Max.) = 2.0Ω @ V_{GS} = 10V
- Low Crss
- Fast Switching
- 100 % Avalanche Tested



Applications

- Charger
- STB
- Open Framed Power Supply



TO-220

TO-220F

Absolute Maximum Ratings (Tc = 25˚C unless otherwise noted)

Symbol	Parameter	Limit		Unit
		TO-220	TO-220F	
V_{DS}	Drain-Source Voltage [a]	600		V
V_{GS}	Gate-Source Voltage	± 30		V
I_D	Drain Current-Continuous, T_C =25℃	5		A
	Drain Current-Continuous, T_C =100 ℃	3		A
I_{DM}	Drain Current-Pulsed [b]	20		A
P_D	Maximum Power Dissipation @ T_J =25 ℃	104	35	W
E_{AS}	Single Pulsed Avalanche Energy [e]	114		mJ
dv/dt	Peak Diode Recovery dv/dt [c]	4.5		V/ns
T_J, T_{STG}	Operating and Store Temperature Range	-55 to 150		℃

Thermal Characteristics

Symbol	Parameter	Value		Unit
$R_{\theta JC}$	Thermal Resistance, Junction-Case Max.	1.2	3.6	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-Ambient Max.	63		℃/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	600	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 600V, V_{GS} = 0V	-	-	20	μ A
I_{GSSF}	Forward Gate Body Leakage Current	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

$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	2.9	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance [d]	V_{GS} = 10V, I_D = 3A	-	1.6	2	Ω
g_{FS}	Forward Transconductance [d]	V_{DS} = 15V, I_D = 2.5A	-	2.2	10	S

■ Dynamic Characteristics

Ciss	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	798	-	pF
Coss	Output Capacitance		-	114	-	pF
Crss	Reverse Transfer Capacitance		-	25	-	pF

■ Switching Characteristics

td(on)	Turn-On Delay Time	V_{DD} = 300V, I_D = 5A, R_G = 10Ω, V_{GS} = 10V	-	25	-	ns
tr	Turn-On Rise Time		-	8.1	-	ns
td(off)	Turn-Off Delay Time		-	38	-	ns
tf	Turn-Off Fall Time		-	7.8	-	ns
Qg	Total Gate Charge	V_{DS} = 300V, I_D = 5A, V_{GS} = 10V	-	19		nC
Qgs	Gate-Source Charge		-	5.8		nC
Qgd	Gate-Drain Charge		-	8		nC

■ Drain-Source Diode Characteristics

I_S	Drain-Source Diode Forward Continuous Current	V_{GS} = 0V	-	-	5	A
I_{SM}	Miximum Pulsed Current	V_{GS} = 0V	-	-	20	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_S = 2.5A	-	0.81	1.5	V
trr	Reverse Recovery time	V_{GS} = 0V, I_S = 5A, di/dt = 100A/μs	-	310	-	ns
Qrr	Reverse Recovery Charge		-	2.1	-	μC

Notes :

a. T_J = +25 C to +150 C.

b. Repetitive rating; pulse width limited by maximum junction temperature.

c. I_{SD}= 5.0A di/dt≦ 100 A/μs, V_{DD}≦ BV_{DSS}, T_J ≦ +150 C.

d. Pulse width≦ 300 μs; duty cycle≦ 2%.

e. L=10mH, V_{DD} =50V, I_{AS} =5A, R_G =25Ω Starting T_J =25 ℃.

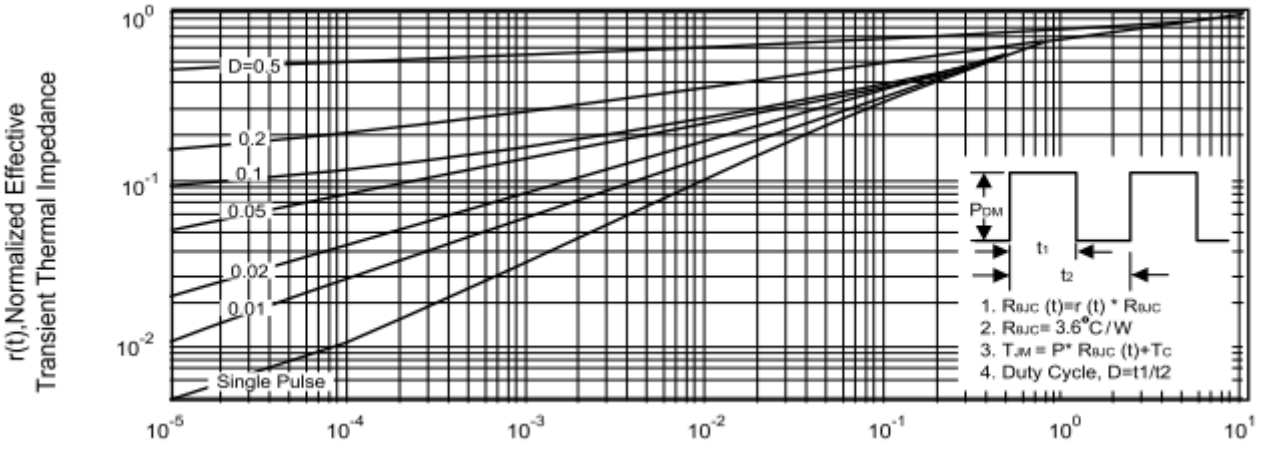


Figure 1. Normalized Effective Transient Thermal Impedance With Pulse Duration

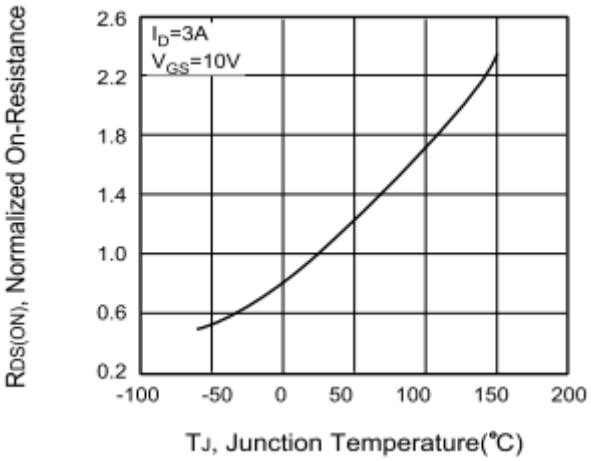
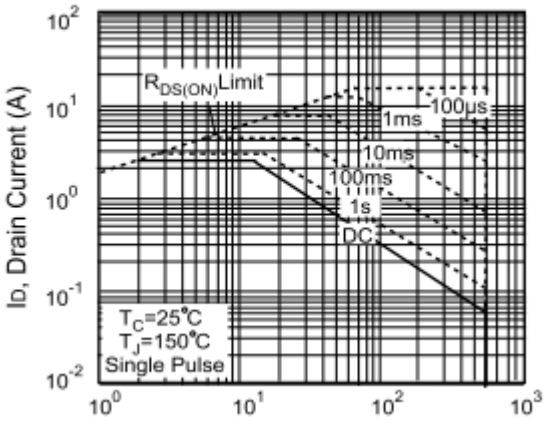


Figure 2. Normalized On-Resistance Variation with Temperature



V_{DS}, Drain-Source Voltage (V) for EC745N60AFR

Figure 3 Maximum Safe Operating Area

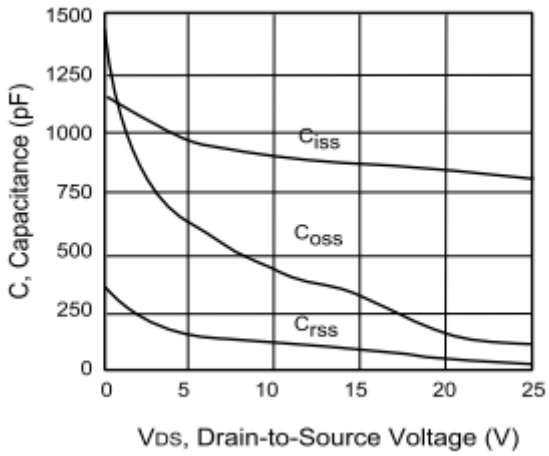


Figure 4. Capacitance Characteristics

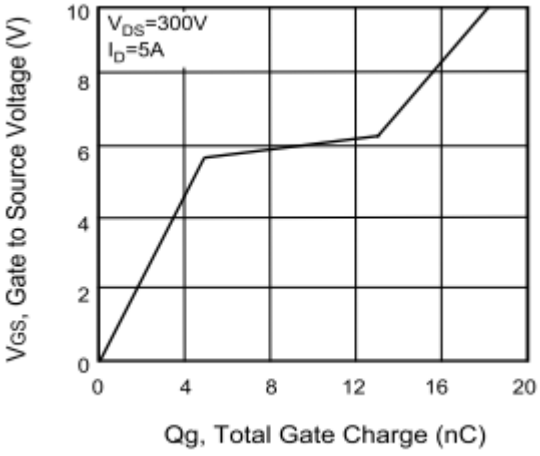


Figure 5. Gate Charge Characteristics

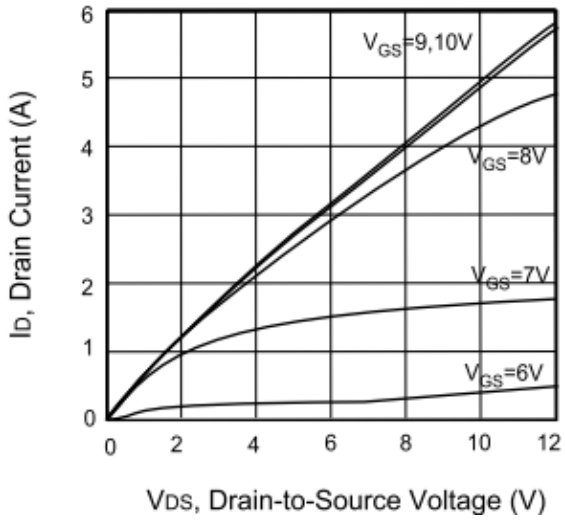


Figure 6. On-state Characteristics

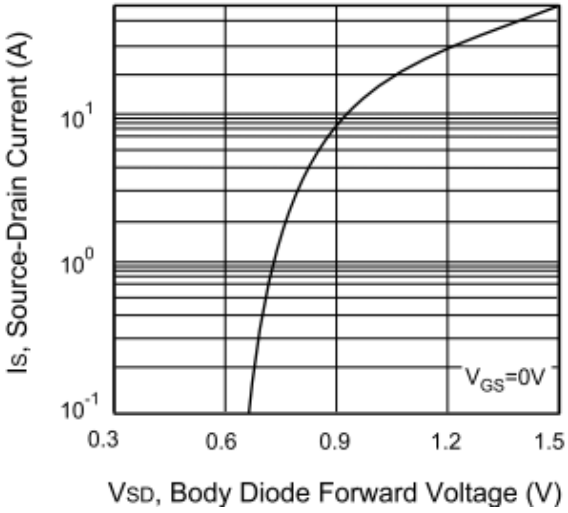


Figure 7. Body Diode Forward Voltage Variation with Source Current

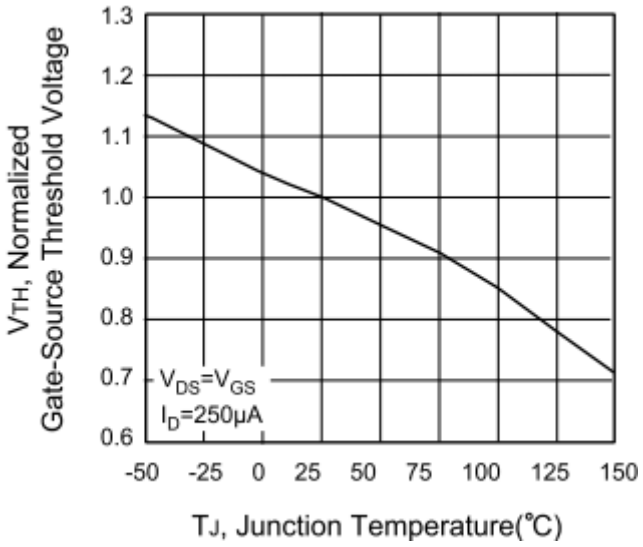


Figure 8. Gate Threshold Variation With Temperature

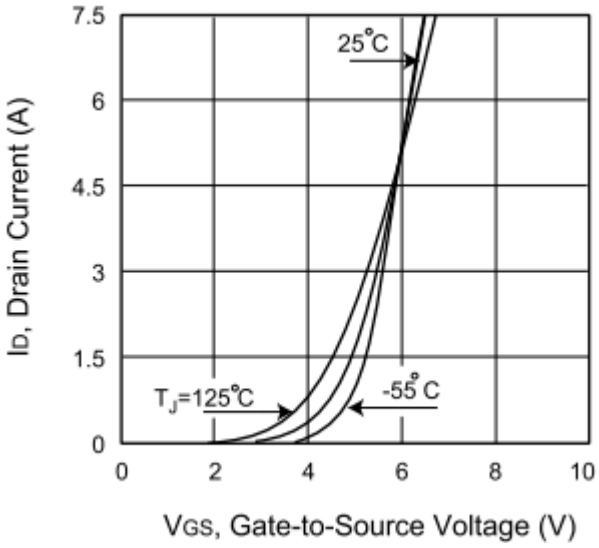


Figure 9. Transfer Characteristics

ORDERING INFORMATION

Part Number	Package	Marking	Marking Information
EC745N60AFR	TO-220F-3L	745N60 LLLLL YYWW	1. LLLLL：Lot No. 2. YY：Year code 3. WW：Week code
EC745N60AR	TO-220-3L		