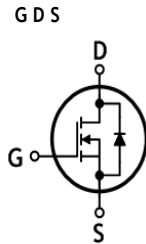
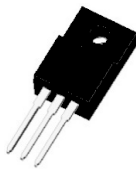
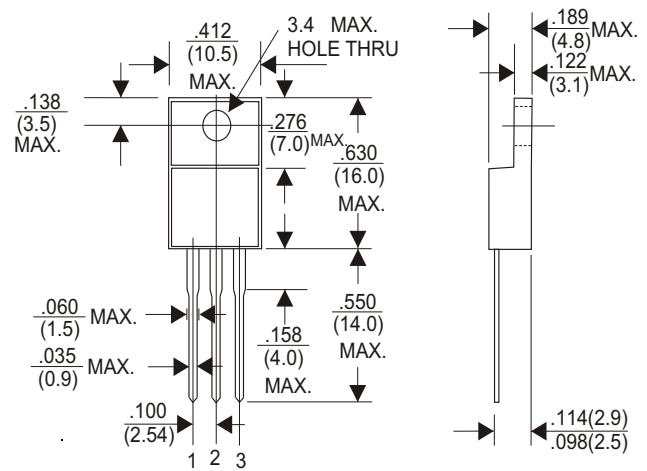


Features

- Drain-Source voltage: $V_{DS}=650V$ (@ $T_J=150^{\circ}C$)
- Low drain-source On resistance: $R_{DS(on)}=0.38\Omega$ (Max.)
- Ultra low gate charge: $Q_g=20nC$ (Typ.)
- RoHS compliant device
- 100% avalanche tested



TO-220F (FULLYINSULATED)



Dimensions in inches and (millimeters)

Absolute maximum ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Characteristic	Symbol	Rating	Unit	
Drain-source voltage	V_{DSS}	650	V	
Gate-source voltage	V_{GSS}	± 30	V	
Drain current (DC) (Note 1)	I_D	$T_C=25^{\circ}C$	11	A
		$T_C=100^{\circ}C$	7	A
Drain current (Pulsed) (Note 1)	I_{DM}	44	A	
Single pulsed avalanche energy (Note 2)	E_{AS}	135	mJ	
Repetitive avalanche current (Note 1)	I_{AR}	5	A	
Repetitive avalanche energy (Note 1)	E_{AR}	63.2	mJ	
Power dissipation	P_D	32	W	
Diode dv/dt ruggedness (Note 3)	dv/dt	15	V/ns	
MOSFET dv/dt ruggedness (Note 4)	dv/dt	50	V/ns	
Junction temperature	T_J	150	$^{\circ}C$	
Storage temperature range	T_{stg}	-55~150	$^{\circ}C$	

Thermal Characteristics

Characteristic	Symbol	Rating	Unit
Thermal resistance, junction to case	$R_{th(j-c)}$	Max. 3.9	$^{\circ}C/W$
Thermal resistance, junction to ambient	$R_{th(j-a)}$	Max. 62.5	

380R65F

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

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV _{DSS}	I _D =250μA, V _{GS} =0	650	-	-	V
Gate threshold voltage	V _{GS(th)}	I _D =250μA, V _{DS} =V _{GS}	2	3	4	V
Drain-source cut-off current	I _{DSS}	V _{DS} =650V, V _{GS} =0V	-	-	1	μA
		V _{DS} =650V, T _J =125°C	-	-	100	μA
Gate leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±30V	-	-	±100	nA
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =5.5A	-	0.31	0.38	Ω
Internal gate resistance	R _g	f=1MHz, Open drain	-	21	28	Ω
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	629	787	945	pF
Output capacitance	C _{oss}		344	431	518	
Reverse transfer capacitance	C _{rss}		19	24	29	
Turn-on delay time (Note 3)	t _{d(on)}	V _{DS} =350V, I _D =11A, R _G =25Ω	-	17	25	ns
Rise time (Note 3)	t _r		-	14	24	
Turn-off delay time (Note 3)	t _{d(off)}		-	40	55	
Fall time (Note 3)	t _f		-	5	8	
Total gate charge (Note 4)	Q _g	V _{DS} =400V, V _{GS} =10V, I _D =7A	-	20	25	nC
Gate-source charge (Note 4)	Q _{gs}		-	6.5	10	
Gate-drain charge (Note 4)	Q _{gd}		-	5	10	

Source-Drain Diode Ratings and Characteristics (T_C=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I _S	Integral reverse diode in the MOSFET	-	-	11	A
Source current (Pulsed)	I _{SM}		-	-	44	A
Forward voltage	V _{SD}	V _{GS} =0V, I _S =11A	-	-	1.2	V
Reverse recovery time (Note 3,4)	t _{rr}	I _S =11A, V _{GS} =0V, di _S /dt=100A/us	-	326	450	ns
Reverse recovery charge (Note 3,4)	Q _{rr}		-	2.8	4.5	μC

Note:

1. Calculated continuous current based on maximum allowable junction temperature
2. L=10mH, I_{AS}=5A, V_{DD}=50V, Starting T_J=25°C
3. Guaranteed by design, not subject to production testing
4. Pulse test: Pulse width≤300us, Duty cycle≤2%

RATING AND CHARACTERISTIC CURVES (380R65F)

Fig. 1 Typical Output Characteristics

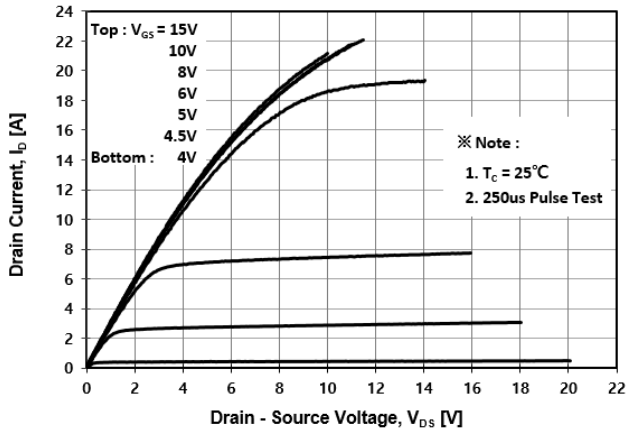


Fig. 2 Typical Transfer Characteristics

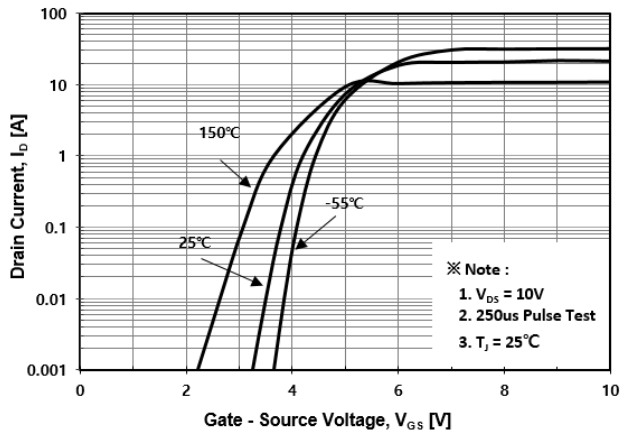


Fig. 3 On-Resistance Variation with Drain Current and Gate Voltage

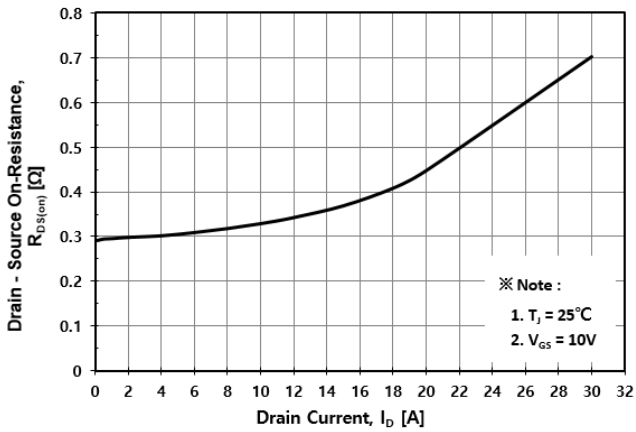


Fig. 4 Body Diode Forward Voltage Variation with Source Current

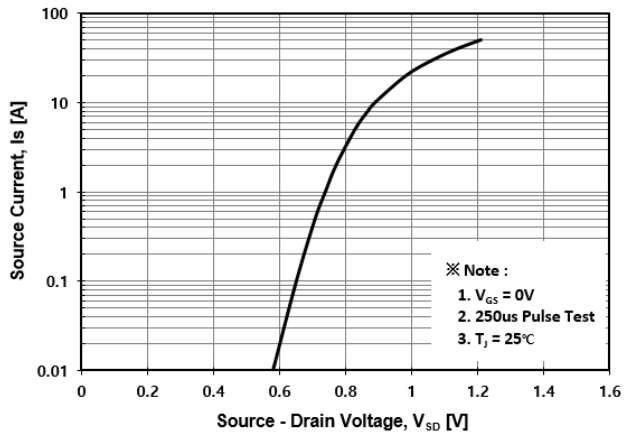


Fig. 5 Typical Capacitance Characteristics

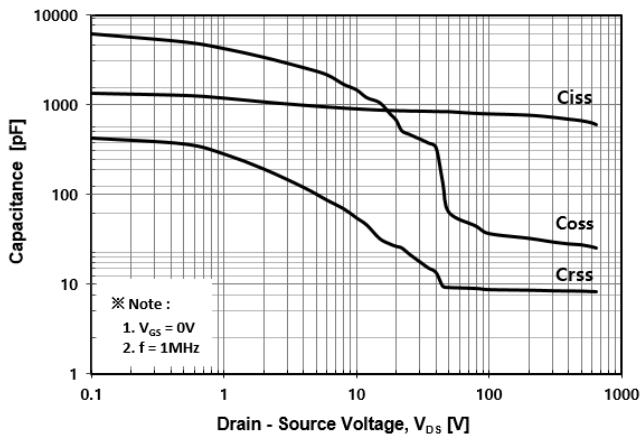
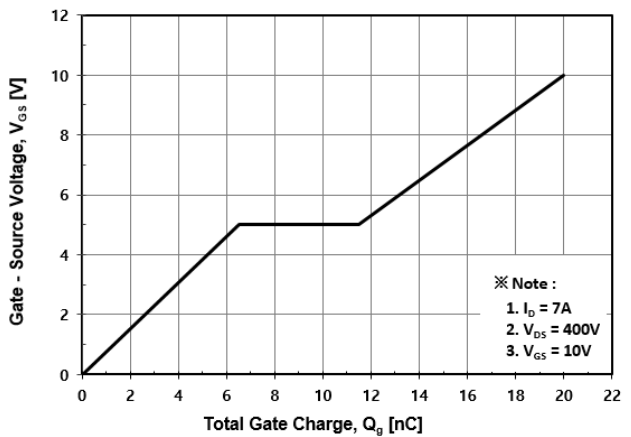


Fig. 6 Typical Total Gate Charge Characteristics



RATING AND CHARACTERISTIC CURVES (380R65F)

Fig. 7 Breakdown Voltage Variation vs. Temperature

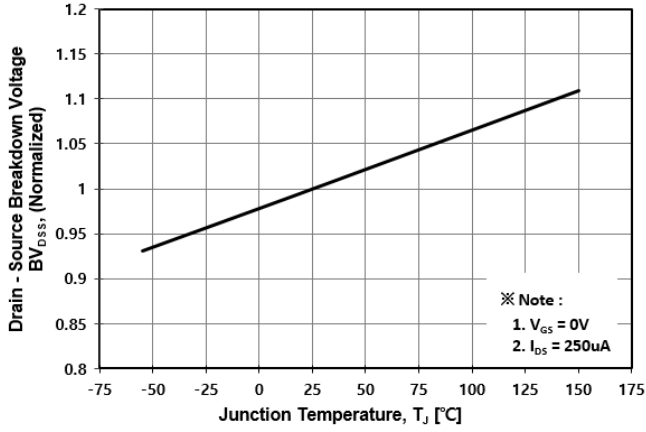


Fig. 8 On-Resistance Variation vs. Temperature

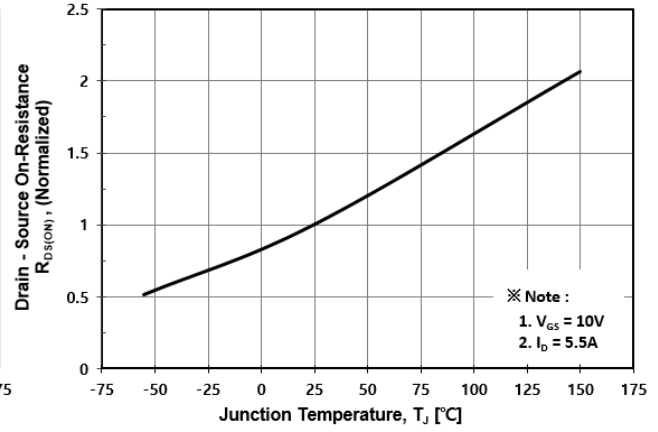


Fig. 9 Maximum Drain Current vs. Case Temperature

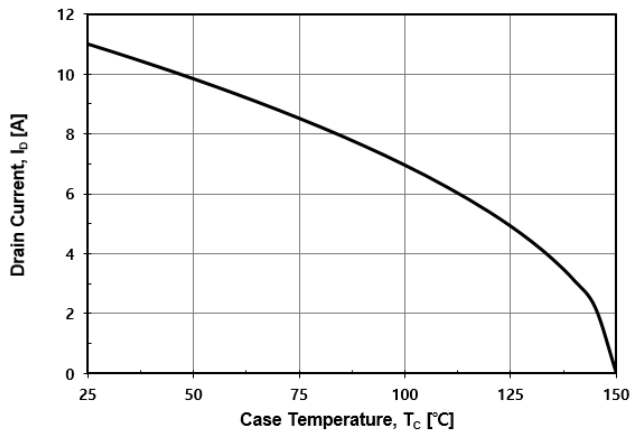


Fig. 10 Maximum Safe Operating Area

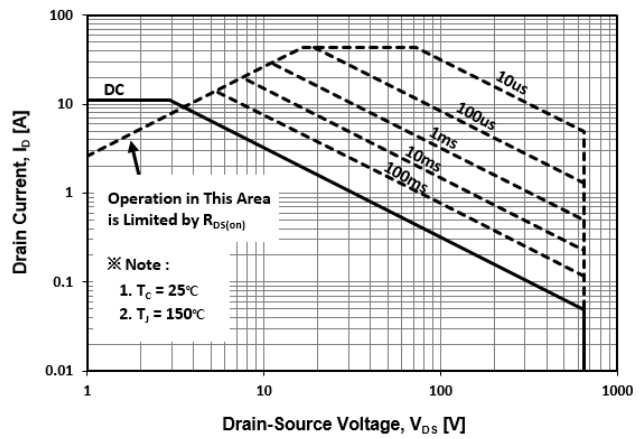
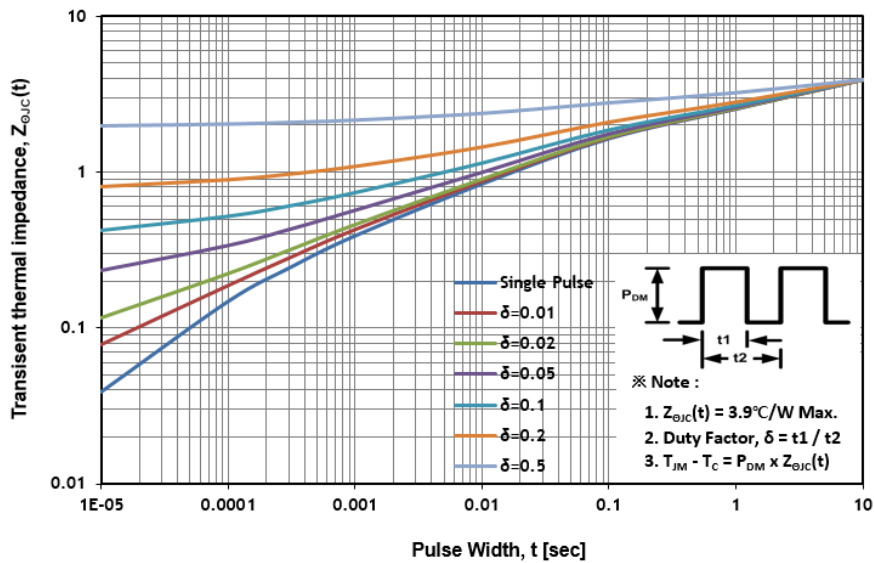


Fig. 11 Transient Thermal Impedance



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