

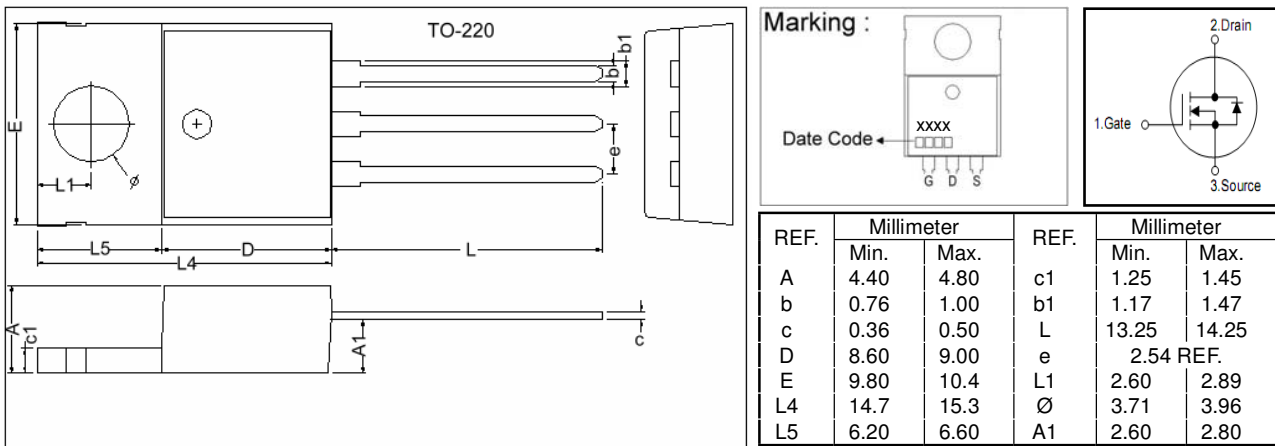
N-Channel MOSFET

V_{DSS}	400V
$R_{DS(ON)}$	0.6 Ω
I_D	9A

Features

- * Ultra low gate charge (typical 29nC)
- * Fast switching capability
- * Avalanche energy tested
- * Improved dv/dt capability, high ruggedness
- * Lower $R_{DS(ON)}$

Package Dimensions



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

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DSS}	400	V
Gate-source voltage		V_{GSS}	2-4	V
Drain current continuous	$T_C=25^\circ\text{C}$	I_D	9	A
	$T_C=100^\circ\text{C}$		4.7	A
Drain current pulsed (note1)		I_{DP}	29.6	A
Avalanche energy	Repetitive (note1)	E_{AR}	14.2	mJ
	Single Pulse (note2)	E_{AS}	580	mJ
Peak diode recovery dv/dt (note3)		dv/dt	4.5	V/ns
Total power dissipation	$T_C=25^\circ\text{C}$	P_D	142	W
	Derate above 25°C		1.14	W/ $^\circ\text{C}$
Junction temperature		T_J	+150	$^\circ\text{C}$
Storage temperature		T_{STG}	-55~+150	$^\circ\text{C}$

Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance junction-ambient	R_{thJA}	62.5	$^\circ\text{C/W}$
Thermal resistance, case-to-sink typ.	R_{thCS}	0.5	
Thermal resistance junction-case	R_{thJC}	0.88	

Electrical characteristics (T_J=25°C, unless otherwise notes)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Off characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	400	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =600V, V _{GS} =0V	-	-	10	μA
		V _{DS} =480V, T _C =125°C	-	-	100	μA
Gate-body leakage current	Forward	I _{GSS}	-	-	100	nA
	Reverse				-100	nA
Breakdown voltage temperature coefficient	ΔBV _{DSS} /ΔT _J	I _D =250μA	-	0.67	-	V/°C
On characteristics						
Gate threshold voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	3.0	-	5.0	V
Static drain-source on-resistance	R _{DS(ON)}	V _{DS} =10V, I _D =3.7A	-	0.6	1.0	Ω
Dynamic characteristics						
Input capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	1100	1430	pF
Output capacitance	C _{OSS}		-	135	175	pF
Reverse transfer capacitance	C _{RSS}		-	16	21	pF
Switching characteristics						
Turn-on delay time	t _{D(ON)}	V _{DD} =300V, R _G =25Ω, I _D =7.4A (note 4,5)	-	-	70	ns
Rise time	t _R		-	-	170	ns
Turn-off delay time	t _{D(OFF)}		-	-	140	ns
Fall time	t _F		-	-	130	ns
Total gate charge	Q _G	V _{DS} =480V, V _{GS} =10V I _D =7.4A (note 4,5)	-	29	38	nC
Gate-source charge	Q _{GS}		-	7	-	nC
Gate-drain charge	Q _{GD}		-	14.5	-	nC
Drain-source diode characteristics						
Drain-source diode forward voltage	V _{SD}	V _{GS} =0V, I _{SD} =7.4A	-	-	1.4	V
Continuous drain-source current	I _{SD}		-	-	7.4	A
Pulsed drain-source current	I _{SM}		-	-	29.6	A
Reverse recovery time	t _{RR}	I _{SD} =7.4A, dI _{SD} /dt=100A/μs (note 4)	-	320	-	ns
Reverse recovery charge	Q _{RR}		-	2.4	-	μC

Note: 1. Repetitive rating: pulse width limited by maximum junction temperature

2. L=19.5mH, I_{AS}=7.4A, V_{DD}=50V, R_G=25Ω, starting T_J=25°C

3. I_{SD}≤7.4A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, starting T_J=25°C

4. Pulse test: pulse width ≤300μs, duty cycle ≤2%

5. Essentially independent of operating temperature

Test circuits and waveforms

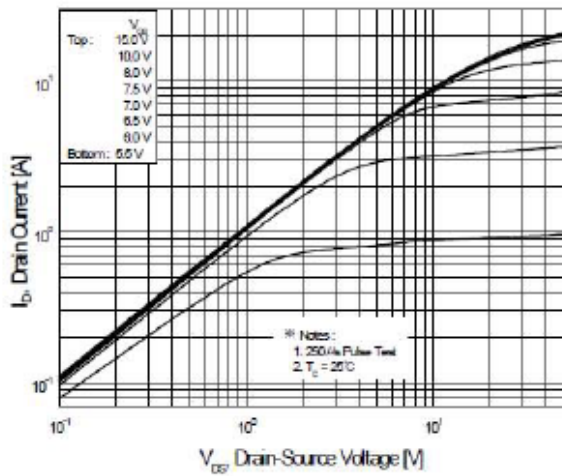


Figure 1. On-Region Characteristics

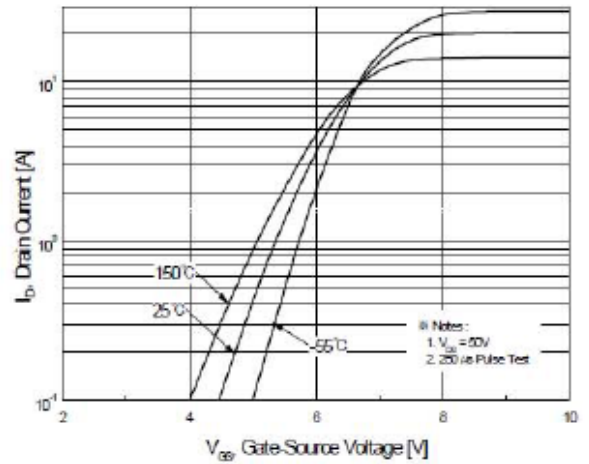


Figure 2. Transfer Characteristics

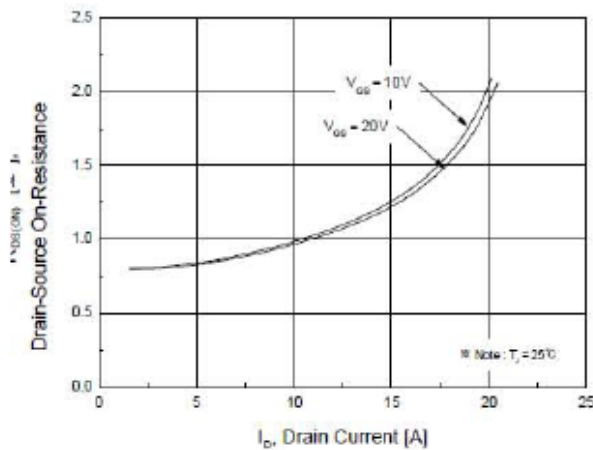


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

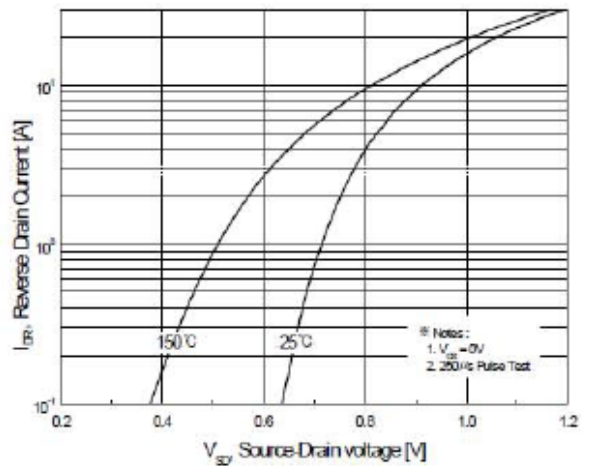


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

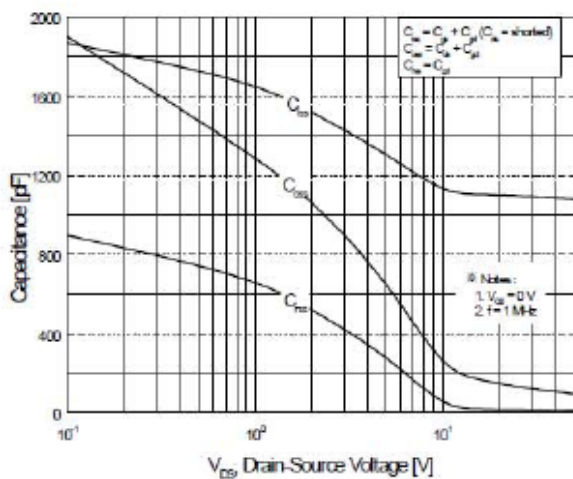


Figure 5. Capacitance Characteristics

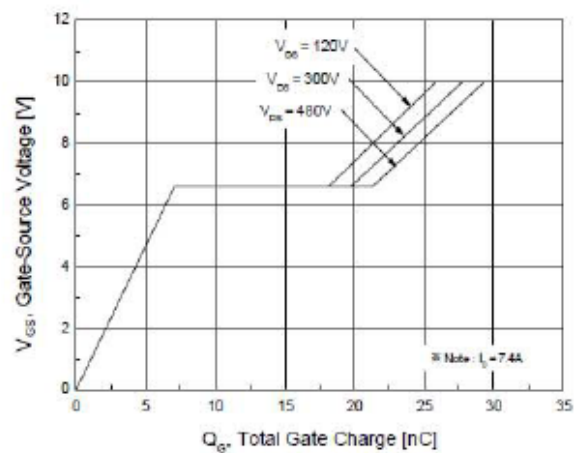


Figure 6. Gate Charge Characteristics

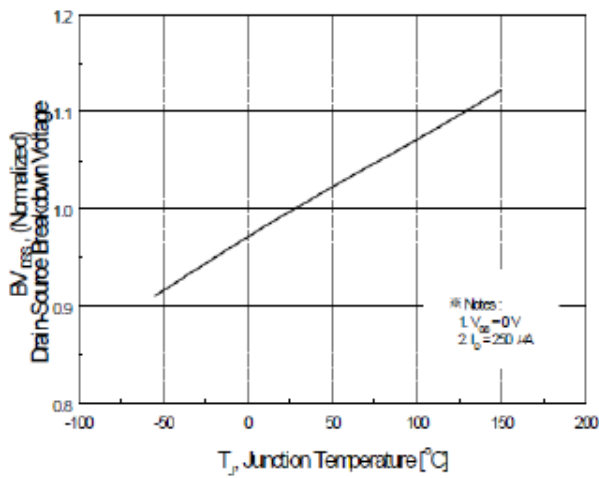


Figure 7. Breakdown Voltage Variation vs. Temperature

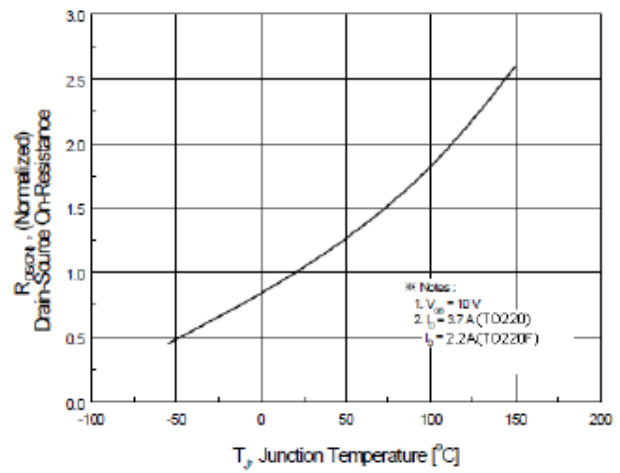


Figure 8. On-Resistance Variation vs. Temperature

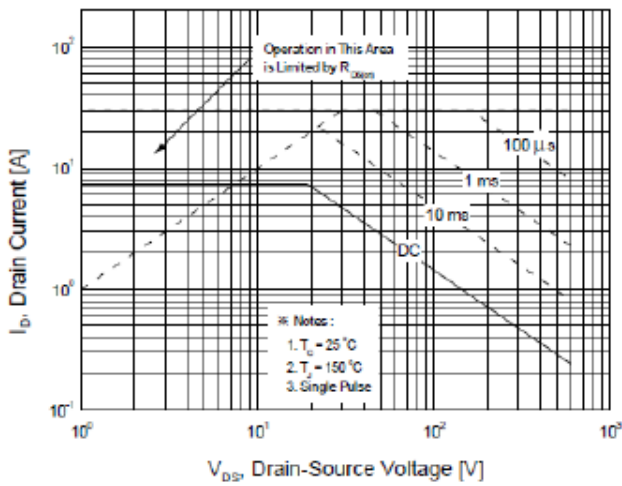


Figure 9. Maximum Safe Operating Area

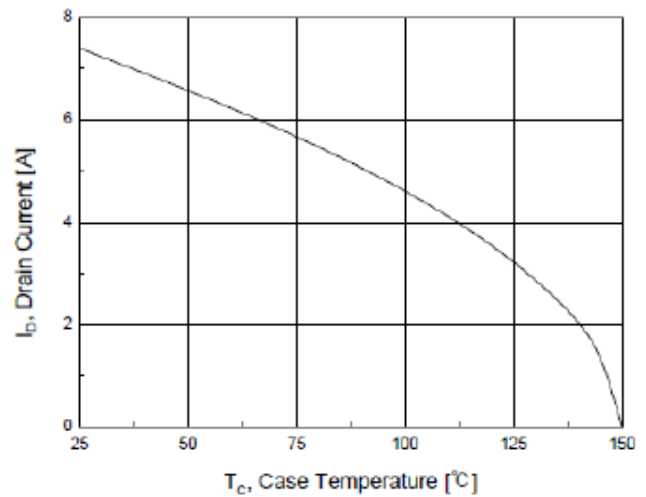


Figure 10. Maximum Drain Current vs. Case Temperature

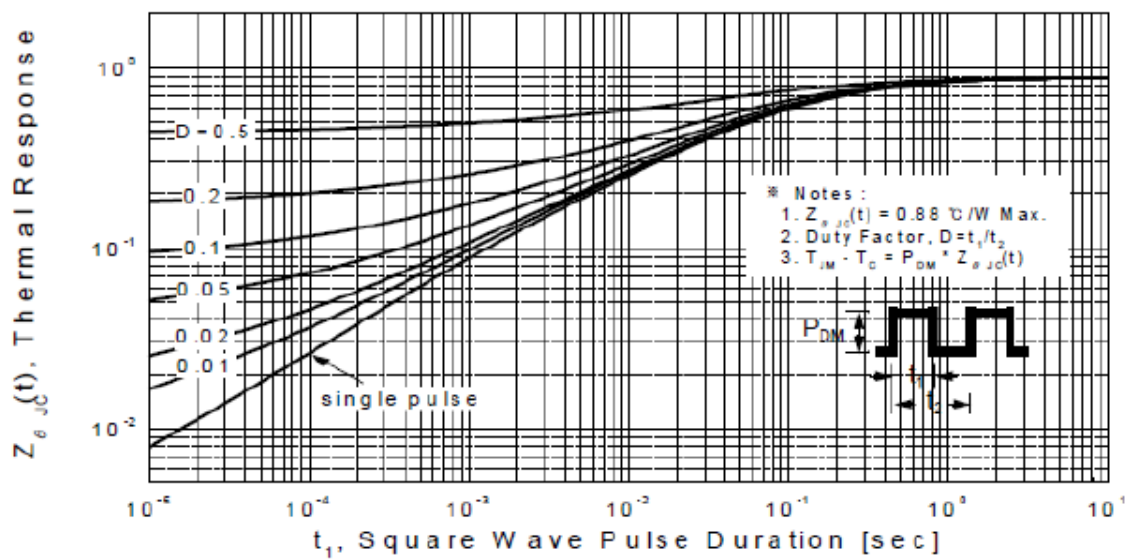


Figure 11. Transient Thermal Response Curve