

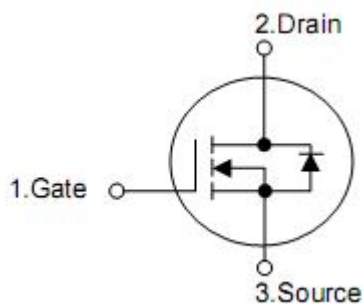
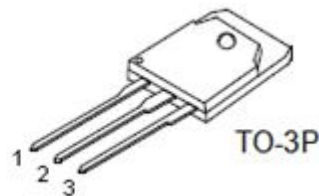
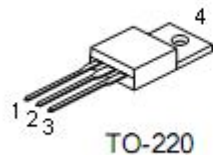
1. Features

- $R_{DS(ON)}=0.08\Omega$ (Max.) @ $V_{GS}=10V$
- RoHS compliant
- Low on resistance
- Low gate charge
- Fast switching

2. Applications

- DC-DC converters
- DC-AC converters for UPS
- SMPS and motor controls

3. Symbol



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Absolute maximum ratings

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

Parameter	Symbol	Rating	Units
Drain-source voltage	V_{DSS}	200	V
Continuous drain current	I_D	40	A
Continuous drain current $T_C=100^{\circ}\text{C}$		19.2	A
Pulsed drain current, $V_{GS}@10\text{V}$ (note*1)	I_{DM}	120	A
Power dissipation	P_D	175	W
Derating factor above 25°C		1.43	W/ $^{\circ}\text{C}$
Gate-source voltage	V_{GS}	± 30	V
Single pulse avalanche energy (note*2)	E_{AS}	800	mJ
Avalanche current (note*1)	I_{AR}	32	A
Repetitive avalanche energy (note*1)	E_{AR}	17.5	mJ
Peak diode recovery dv/dt (note*3)	dv/dt	4.5	V/ns
Operating junction and storage temperature range	T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$
Maximum temperature for soldering 1/8" from case for 5 seconds	T_L	300	$^{\circ}\text{C}$

5. Thermal characteristics

Parameter	Symbol	TO-220	TO-3P	Unit
Junction-case	$R_{\theta JC}$	0.49	0.6	$^{\circ}\text{C/W}$
Case-sink typ	$R_{\theta JS}$	0.5	-	
Junction-ambient	$R_{\theta JA}$	62.5	60	$^{\circ}\text{C/W}$

6. Electrical characteristics

(T_J=25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	200	-	-	V
Breakdown voltage temperature coefficient Figure 11	ΔBV _{DSS} /ΔT _J	Reference 25°C I _D =250uA	-	0.2	-	V/°C
Drain-source leakage current	I _{DSS}	V _{DS} =200V, V _{GS} =0V	-	-	1	μA
		V _{DS} =160V, T _J =125°C	-	-	10	
Gate-source forward leakage	I _{GSS}	V _{GS} =30V	-	-	100	nA
Gate-source reverse leakage		V _{GS} =-30V	-	-	-100	
Drain-source on-resistance Figure 9 and 10	R _{DS(on)}	V _{GS} =10V, I _D =16A	-	0.08	0.1	Ω
Gate threshold voltage, Figure 12	V _{GS(TH)}	V _{DS} = V _{GS} , I _D =250uA	2	-	4	V
Forward transconductance	g _{fs}	V _{DS} =40V, I _D =16A (note*4)	-	22	-	S
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V f=1MHz Figure 14	-	1560	-	pF
Output capacitance	C _{oss}		-	370	-	
Reverse transfer capacitance	C _{rss}		-	150	-	
Turn-on delay time	t _{d(on)}	V _{DD} =100V, I _D =32A, R _G =25Ω, V _{GS} =10V	-	26	-	ns
Rise time	t _r		-	32	-	
Turn-off delay time	t _{d(off)}		-	141	-	
Fall time	t _f		-	83	-	
Total gate charge	Q _g		V _{DS} =160V, I _D =32A, V _{GS} =10V	-	50	
Gate-source charge	Q _{gs}	-		12	-	
Gate-drain ("Miller") charge	Q _{gd}	-		22	-	
Continuous source current (body diode)	I _S	Integral pn-diode in MOSFET	-	-	40	A
Maximum pulsed current (body diode)	I _{SM}		-	-	128	
Diode forward voltage	V _{SD}	I _S =32A, V _{GS} =0V	-	-	1.4	V
Reverse recovery time	t _{rr}	I _S =32A, V _{GS} =0V di/dt=100A/μs	-	215	-	ns
Reverse recovery charge	Q _{rr}		-	1.8	-	uC

Note:*1. I_{AS}=32A, V_{DD}=50V, R_G=25Ω, T_J=25°C

- *2. Repetitive rating; pulse width limited by maximum junction temperature.
- *3. I_{SD} ≤ 40A di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}. T_J=175°C.
- *4. Pulse width ≤ 300μs, duty cycle ≤ 2%.
- *5. Essentially independent of operating temperature.

7. Typical operating characteristics

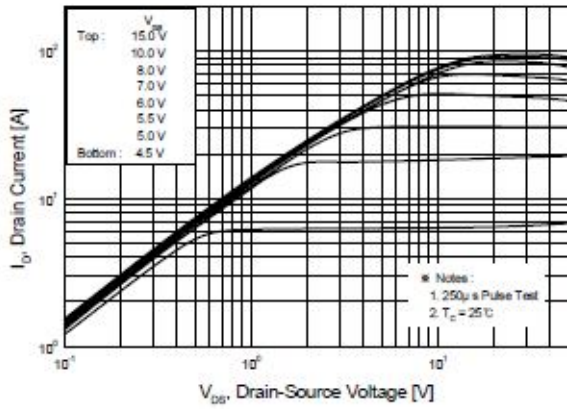


Figure 1. On-Region Characteristics

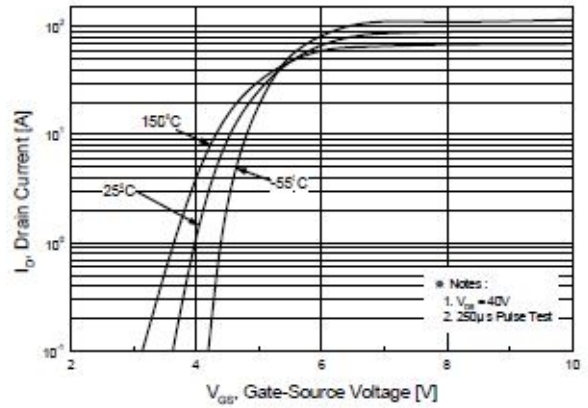


Figure 2. Transfer Characteristics

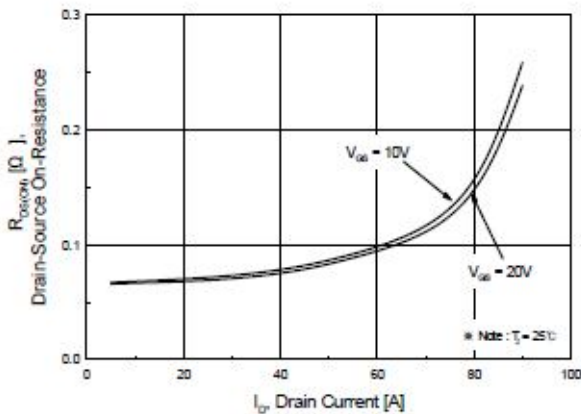


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

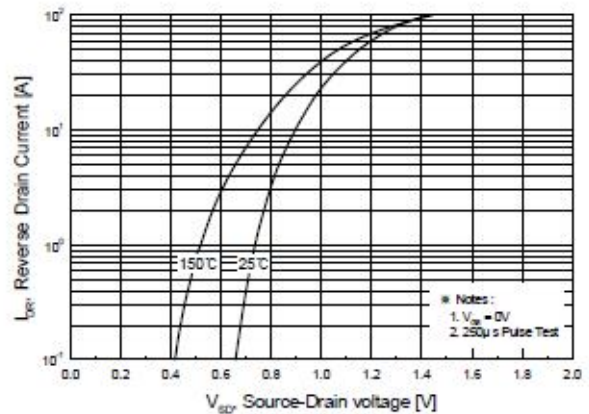


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

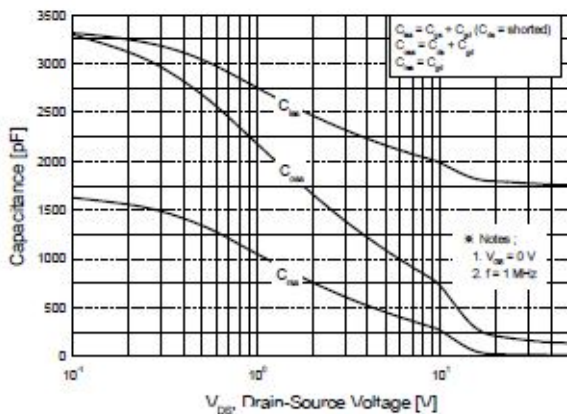


Figure 5. Capacitance Characteristics

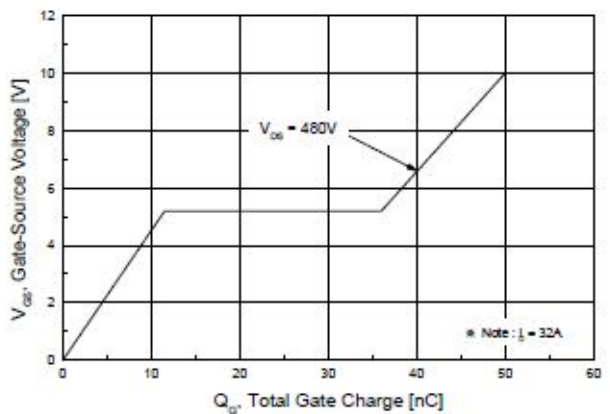


Figure 6. Gate Charge Characteristics

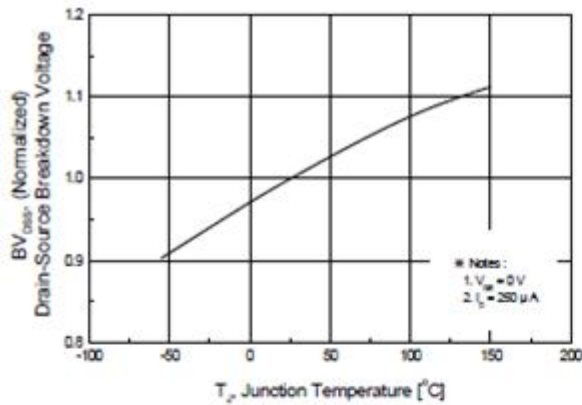


Figure 7. Breakdown Voltage Variation vs Temperature

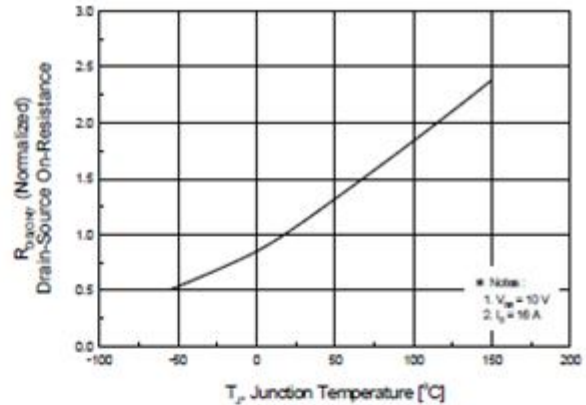


Figure 8. On-Resistance Variation vs Temperature

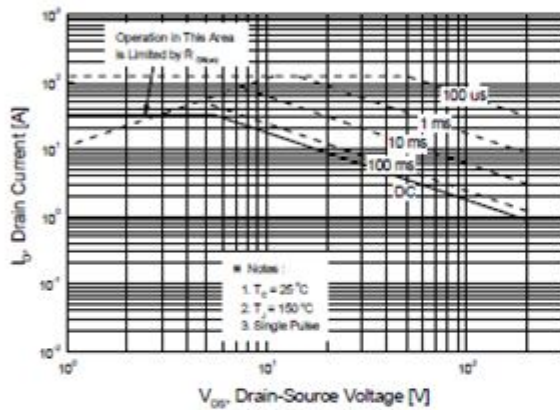


Figure 9. Maximum Safe Operating Area

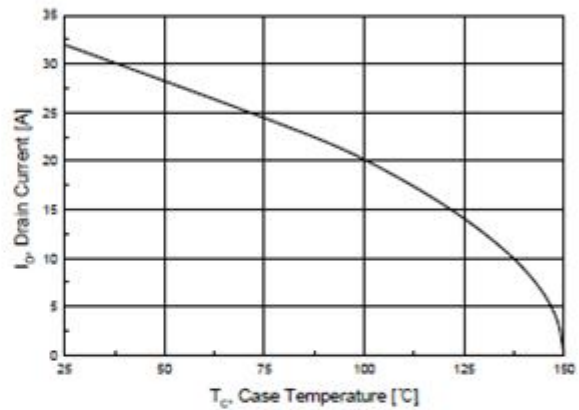


Figure 10. Maximum Drain Current vs Case Temperature

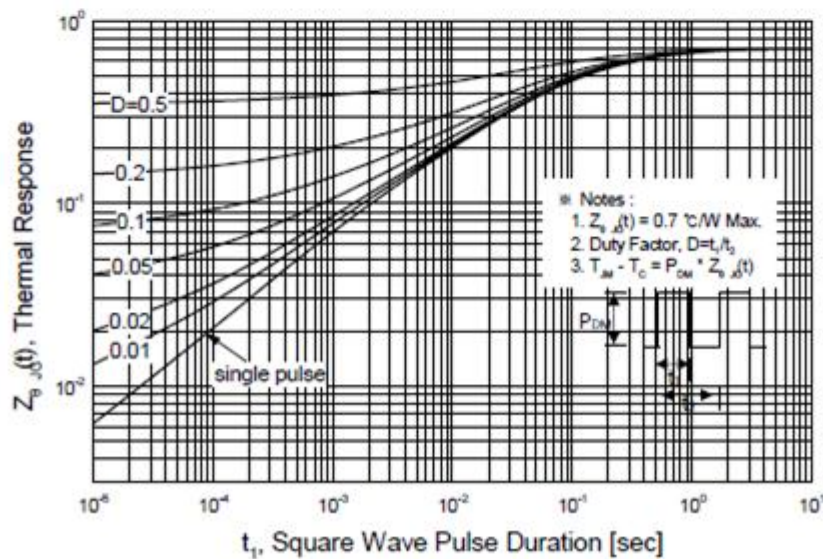


Figure 11. Transient Thermal Response Curve