

30V N-Channel MOSFETS

TO-252 Pin Configuration

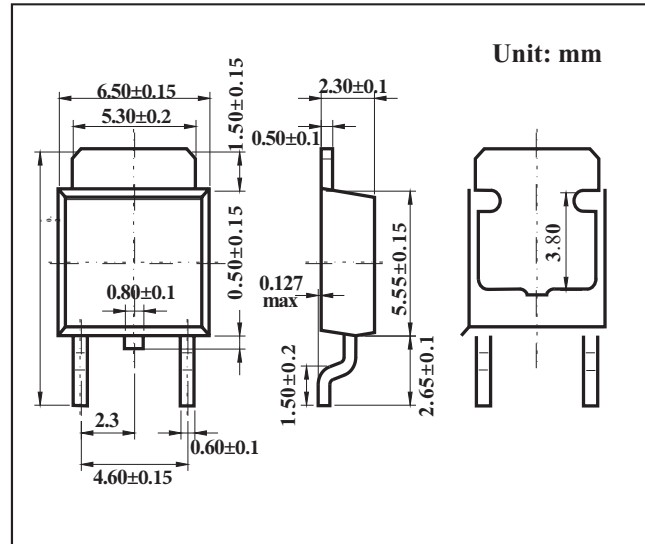
BVDSS	RDSON	ID
30V	4.1mΩ	74A

Features

- 30V, 74A, $R_{DS(ON)} = 4.1m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Applications

- Networking
- Load Switch
- LED applications



MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	VDS	30	V
Gate-Source Voltage	VGS	±20	V
Drain Current – Continuous (TC=25°C)	ID	74	A
Drain Current – Continuous (TC=100°C)		46.8	A
Drain Current – Pulsed ¹	IDM	296	A
Single Pulse Avalanche Energy ²	EAS	115	mJ
Single Pulse Avalanche Current ²	IAS	48	A
Power Dissipation (TC=25°C)	PD	54.3	W
Power Dissipation – Derate above 25°C		0.44	W/°C
Storage Temperature Range	TSTG	-50 to +150	°C
Operating Junction Temperature Range	TJ	-50 to +150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to ambient	RθJA	---	62	°C/W
Thermal Resistance Junction to Case	RθJC	---	2.3	°C/W

MOSFET ELECTRICAL CHARACTERISTICS $T_A=25^{\circ}\text{C}$ unless otherwise specified

Off Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$, $I_D=250\mu A$	30	---	---	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=1mA$	---	0.03	---	$V/^{\circ}\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=30V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=24V$, $V_{GS}=0V$, $T_J=125^{\circ}\text{C}$	---	---	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA

On Characteristics

Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V$, $I_D=15A$	---	3.4	4.1	m Ω
		$V_{GS}=4.5V$, $I_D=10A$	---	4.7	6	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.0	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	-4.17	---	mV/ $^{\circ}\text{C}$
Forward Transconductance	g_{fs}	$V_{DS}=10V$, $I_D=3A$	---	10	---	S

Dynamic and switching Characteristics

Total Gate Charge ^{3, 4}	Q_g	$V_{DS}=15V$, $V_{GS}=10V$, $I_D=15A$	---	34.6	70	nC
Gate-Source Charge ^{3, 4}	Q_{gs}		---	5.5	11	
Gate-Drain Charge ^{3, 4}	Q_{gd}		---	6.8	13	
Turn-On Delay Time ^{3, 4}	$T_{d(on)}$	$V_{DD}=15V$, $V_{GS}=10V$, $R_G=3.3\Omega$ $I_D=1A$	---	9.7	20	ns
Rise Time ^{3, 4}	T_r		---	15.8	31	
Turn-Off Delay Time ^{3, 4}	$T_{d(off)}$		---	37.4	75	
Fall Time ^{3, 4}	T_f		---	12	24	
Input Capacitance	C_{iss}	$V_{DS}=15V$, $V_{GS}=0V$, $F=1MHz$	---	1910	3800	pF
Output Capacitance	C_{oss}		---	300	600	
Reverse Transfer Capacitance	C_{rss}		---	230	460	
Gate resistance	R_g	$V_{GS}=0V$, $V_{DS}=0V$, $F=1MHz$	---	1.14	---	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	$V_G=V_D=0V$, Force Current	---	---	74	A
Pulsed Source Current	I_{SM}		---	---	148	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$, $I_S=1A$, $T_J=25^{\circ}\text{C}$	---	---	1	V
Reverse Recovery Time	t_{rr}	$V_{DS}=30V$, $I_S=10A$, $di/dt=100A/\mu s$	---	2.33	---	μs
Reverse Recovery Charge	Q_{rr}	$T_J=25^{\circ}\text{C}$	---	48.9	---	μC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V$, $V_{GS}=10V$, $L=0.1mH$, $I_{AS}=48A$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$.
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

RATINGS AND CHARACTERISTIC CURVES

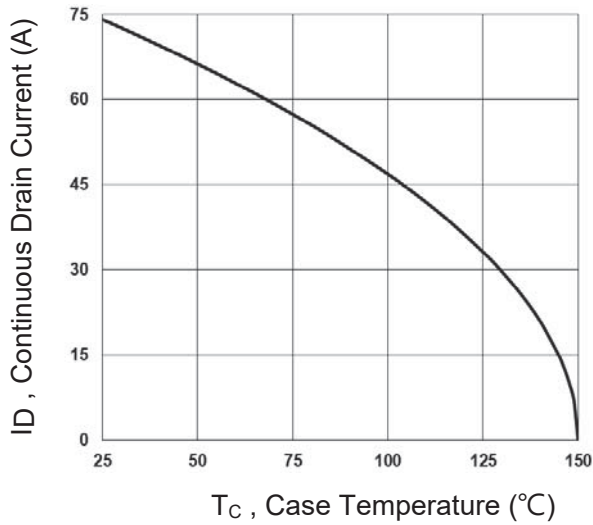


Fig.1 Continuous Drain Current vs. T_C

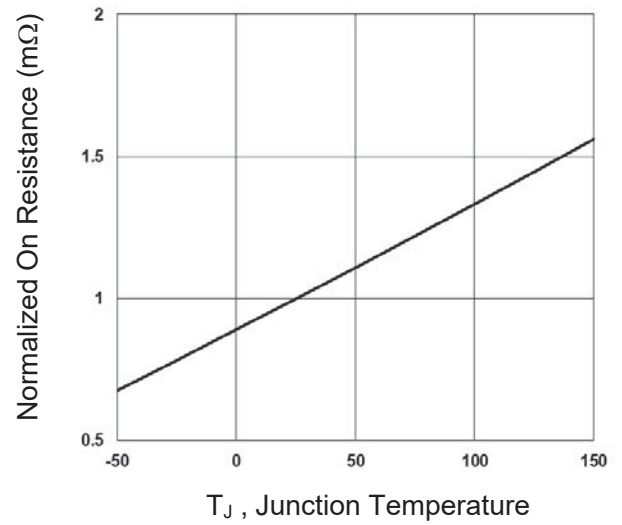


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

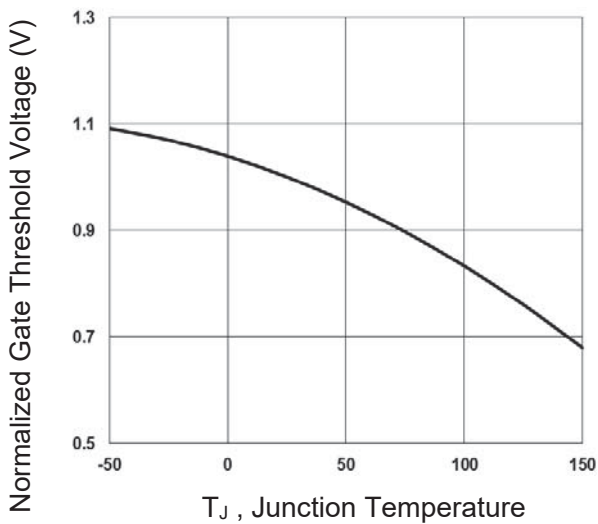


Fig.3 Normalized V_{th} vs. T_J

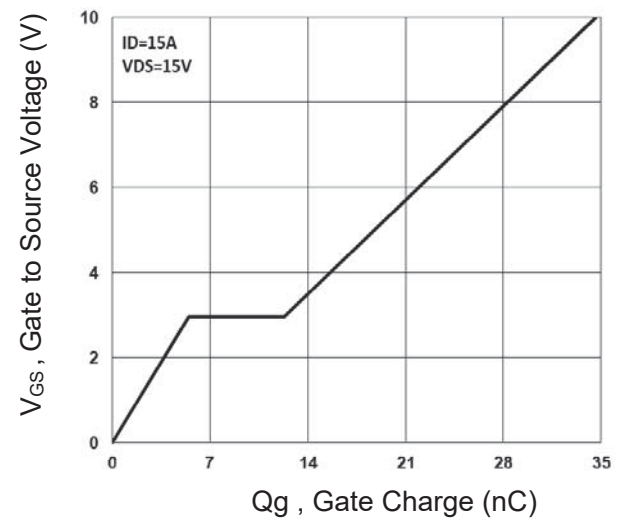


Fig.4 Gate Charge Characteristics

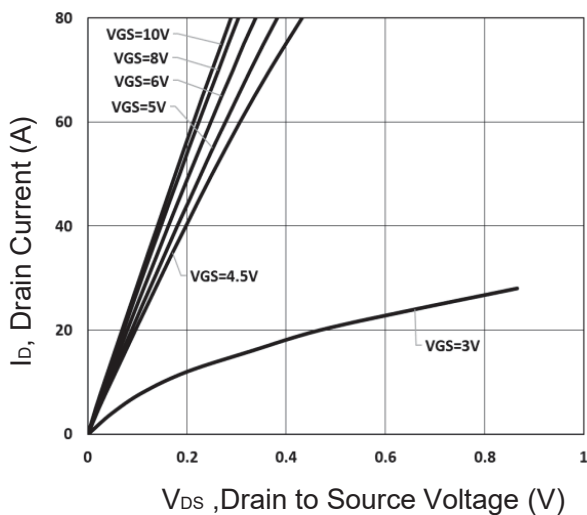


Fig.5 Typical Output Characteristics

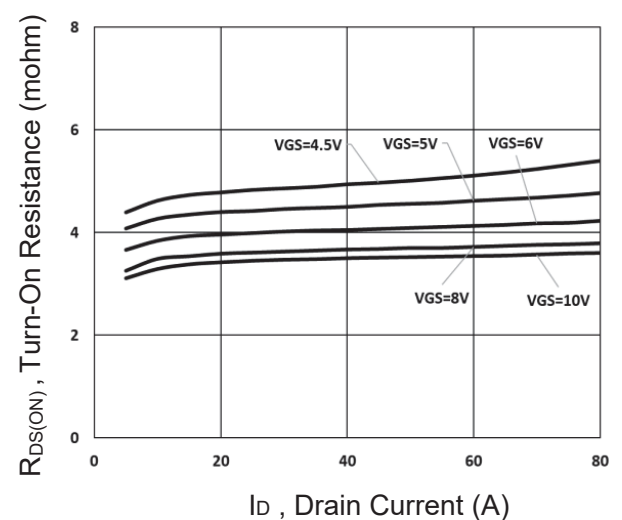


Fig.6 Turn-On Resistance vs. I_D

RATINGS AND CHARACTERISTIC CURVES

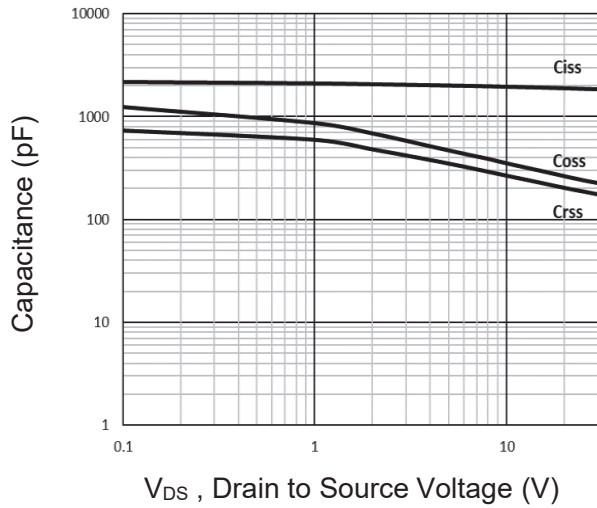


Fig.7 Capacitance Characteristics

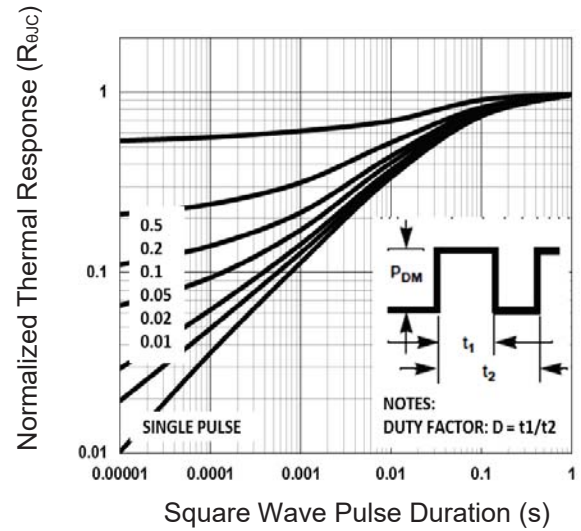


Fig.8 Normalized Transient Impedance

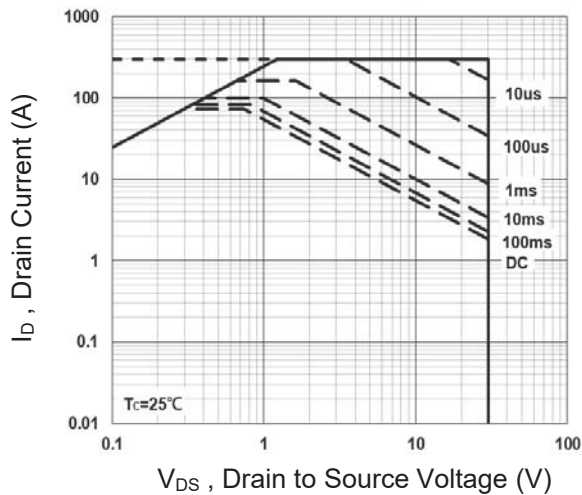


Fig.9 Maximum Safe Operation Area

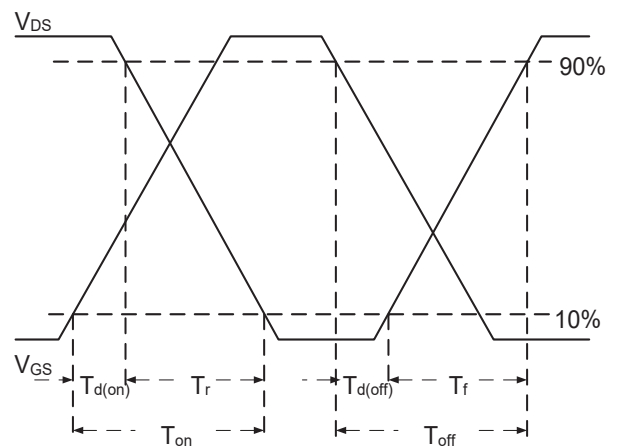


Fig.10 Switching Time Waveform

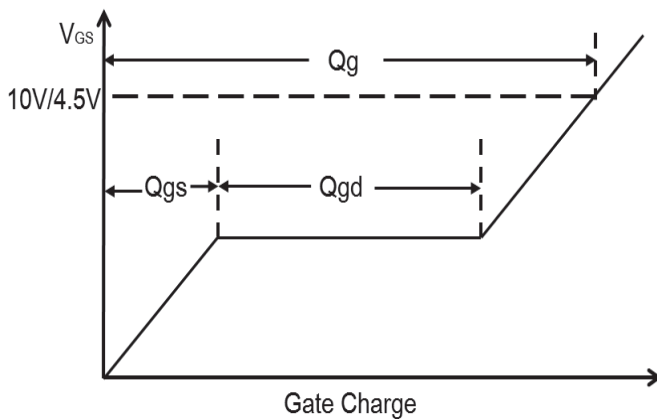


Fig.11 Gate Charge Waveform