

N-Channel Enhancement Mode Power MOSFET

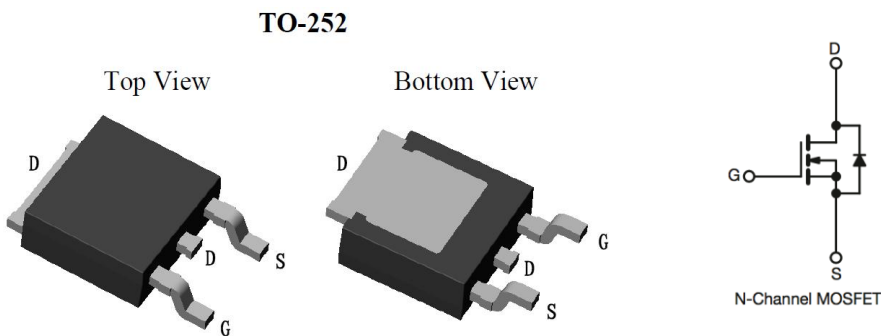
- Features**

V_{DS}	$R_{DS(ON)TYP}$	I_D
30V	4.3 m Ω @10V	58A
	5.4 m Ω @4.5V	

- General Description**

- Motor control and drive
- Battery management
- UPS (Uninterruptible Power Supplies)

- Pin Configurations**



- Absolute Maximum Ratings @ $T_A=25^\circ\text{C}$ unless otherwise noted**

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current (Continuous) *AC	$T_C=25^\circ\text{C}$	I_D	58	A
	$T_C=100^\circ\text{C}$		53	
Drain Current (Pulse) *B		I_{DM}	232	A
Power Dissipation	$T_C=25^\circ\text{C}$	P_D	67	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~+150	$^\circ\text{C}$

- Thermal Resistance Ratings**

Parameter		Symbol	Maximum	Unit
Maximum Junction-to-Ambient	Steady State	R_{thJA}	98	$^\circ\text{C/W}$
	Maximum Junction-to-Case (Drain)	R_{thJC}	1.85	

Electrical Characteristics

$T_A=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$	--	--	1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = 250\mu A$	0.8	1.3	2	V
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	--	--	± 100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 25A$	--	4.3	5.5	m Ω
	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 20A$	--	5.4	6.5	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 25A$	--	82	--	S
Diode Forward Voltage	V_{SD}	$I_{SD} = 20A, V_{GS} = 0V$	--	0.8	1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{GS} = 10V, V_{DS} = 15V, I_D = 25A$ $f = 1.0\text{MHz}$	--	47	--	nC
Gate-Source Charge	Q_{gs}		--	8	--	nC
Gate-Drain Charge	Q_{gd}		--	9	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 15V, I_D = 25A$ $R_{GEN} = 2.7\Omega$	--	12	--	ns
Turn-on Rise Time	t_r		--	97	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	39	--	ns
Turn-Off Fall Time	t_f		--	107	--	ns
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1.0\text{MHz}$	--	2212	--	pF
Output Capacitance	C_{oss}		--	312	--	pF
Reverse Transfer Capacitance	C_{rss}		--	195	--	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the $t \leq 10\text{s}$ junction to ambient thermal resistance rating.

Typical Electrical and Thermal Characteristics

Fig 1: Output Characteristics

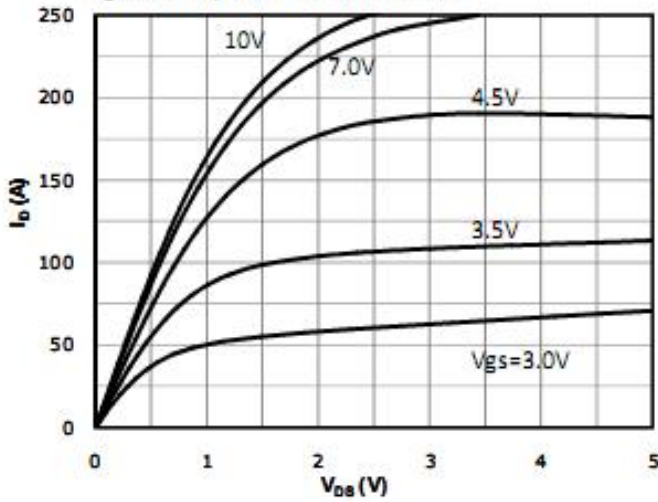


Fig 2: Transfer Characteristics

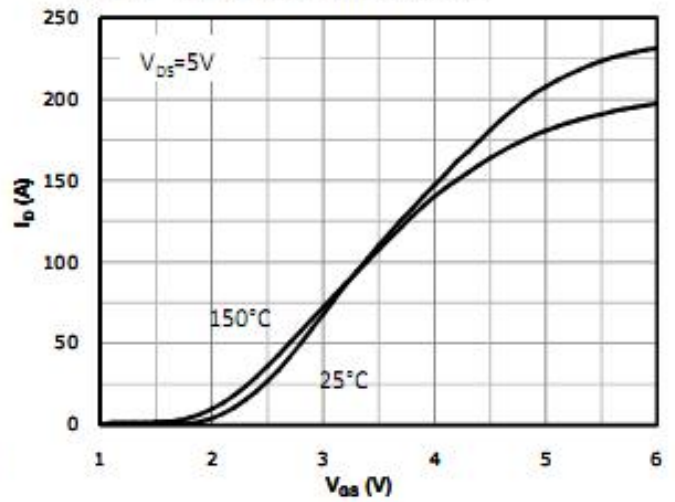


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

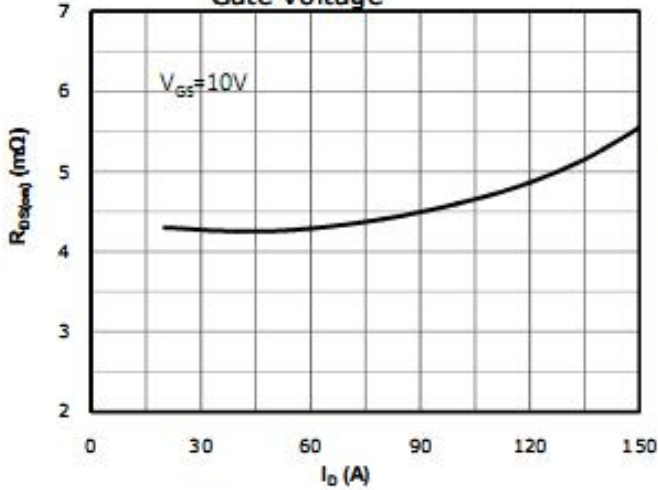


Fig 4: $R_{DS(on)}$ vs Gate Voltage

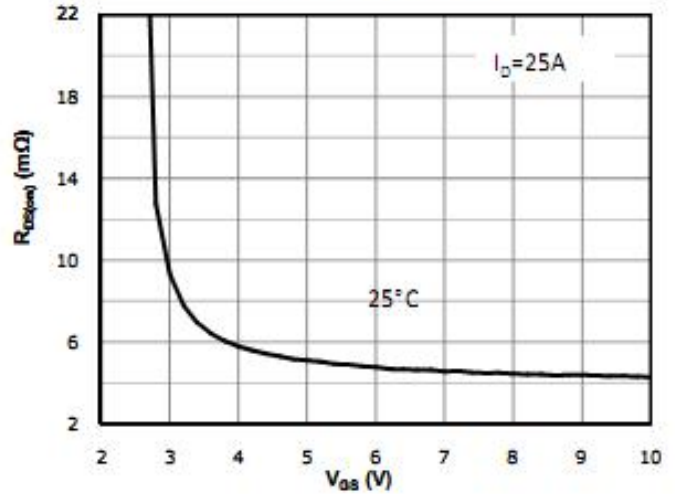


Fig 5: $R_{DS(on)}$ vs. Temperature

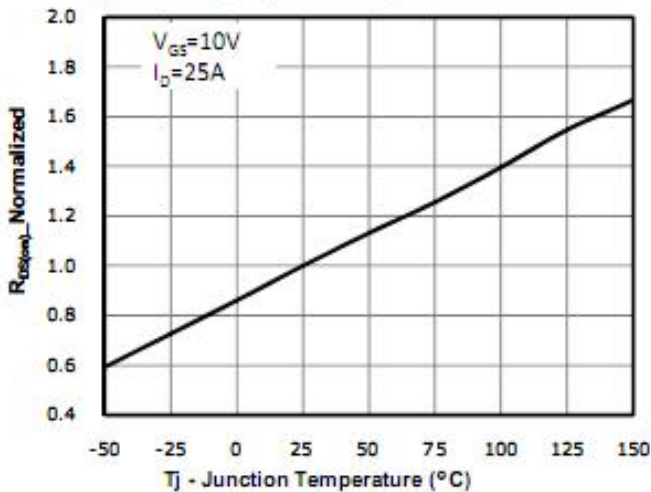
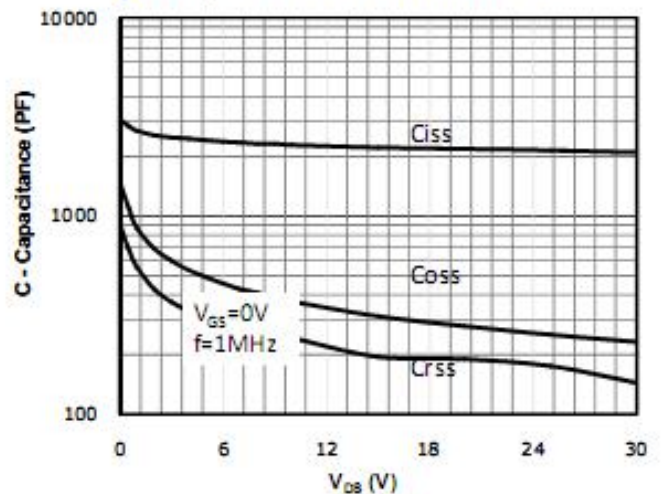


Fig 6: Capacitance Characteristics



Typical Electrical and Thermal Characteristics

Fig 7: Gate Charge Characteristics

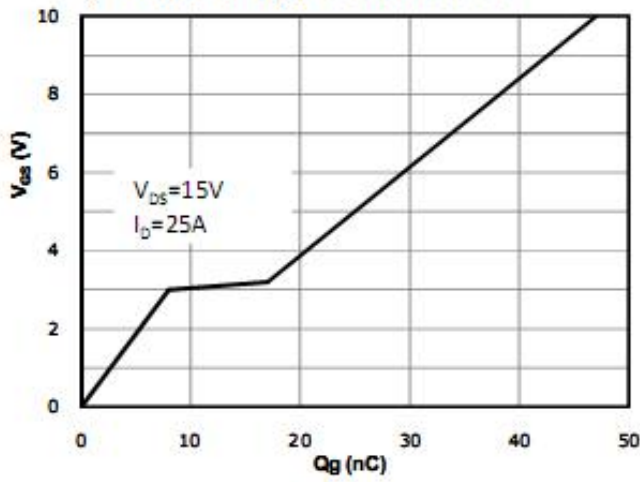


Fig 8: Body-diode Forward Characteristics

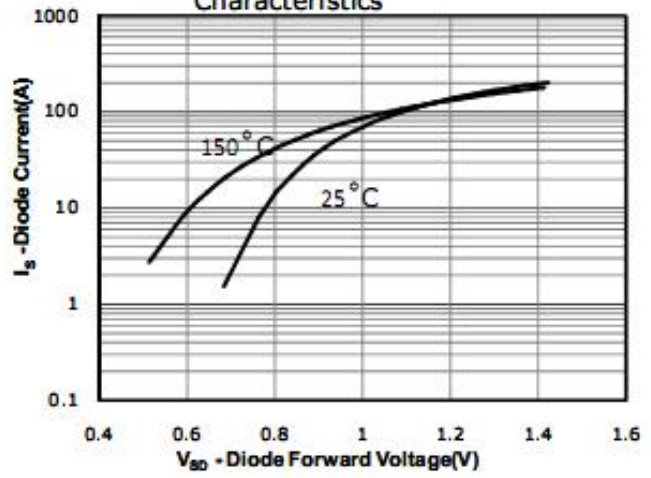


Fig 9: Power Dissipation

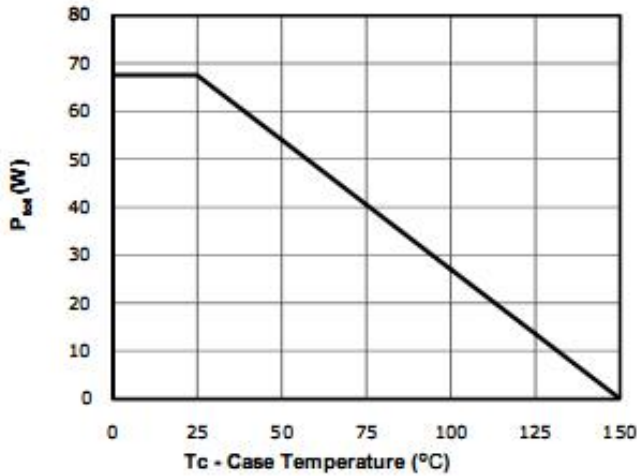


Fig 10: Drain Current Derating

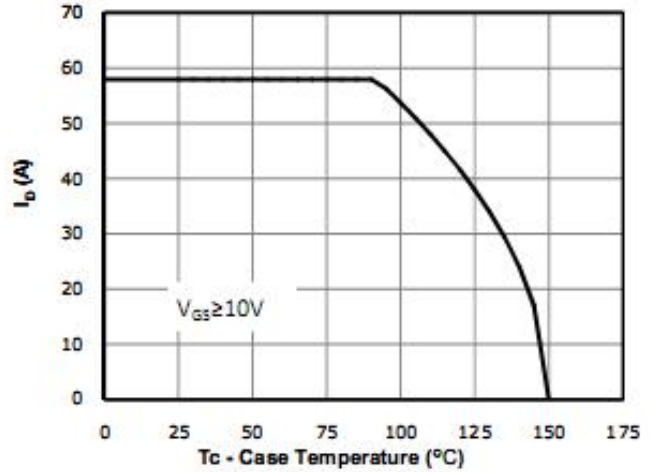
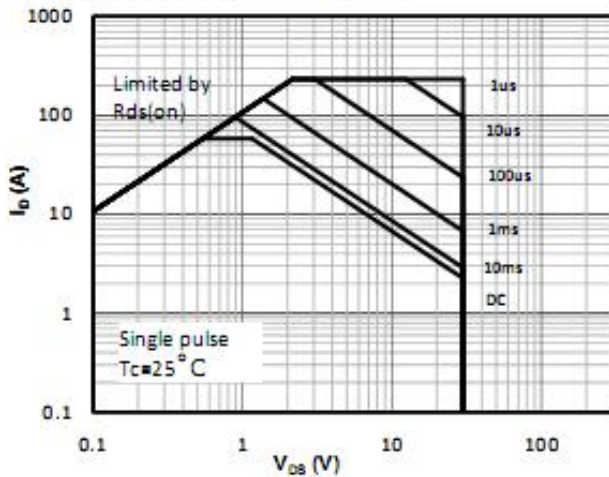
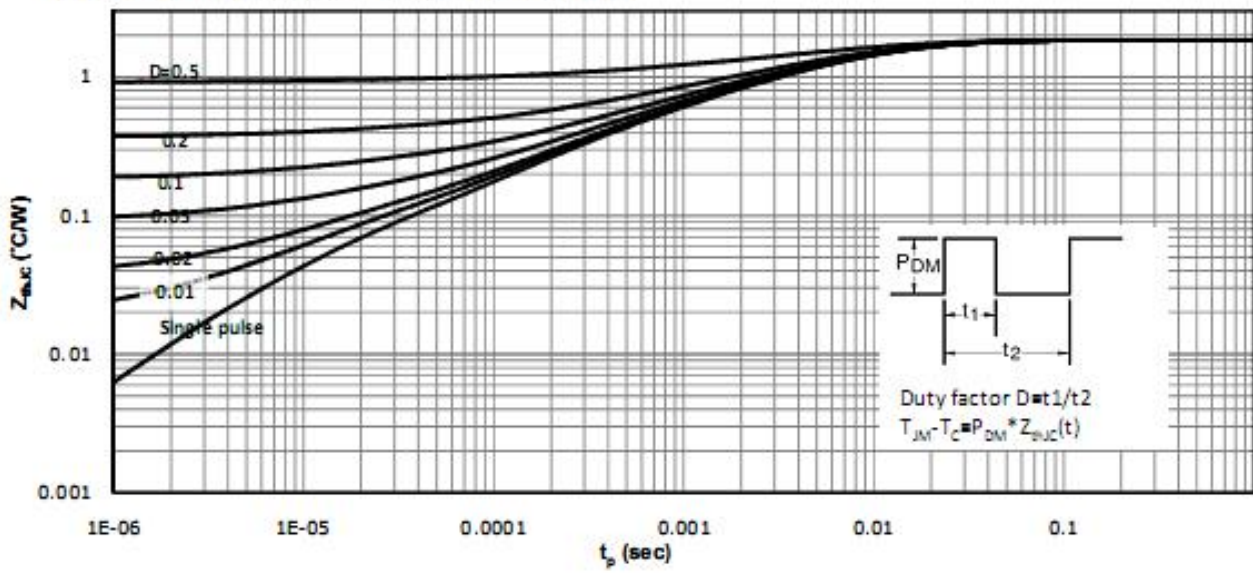


Fig 11: Safe Operating Area



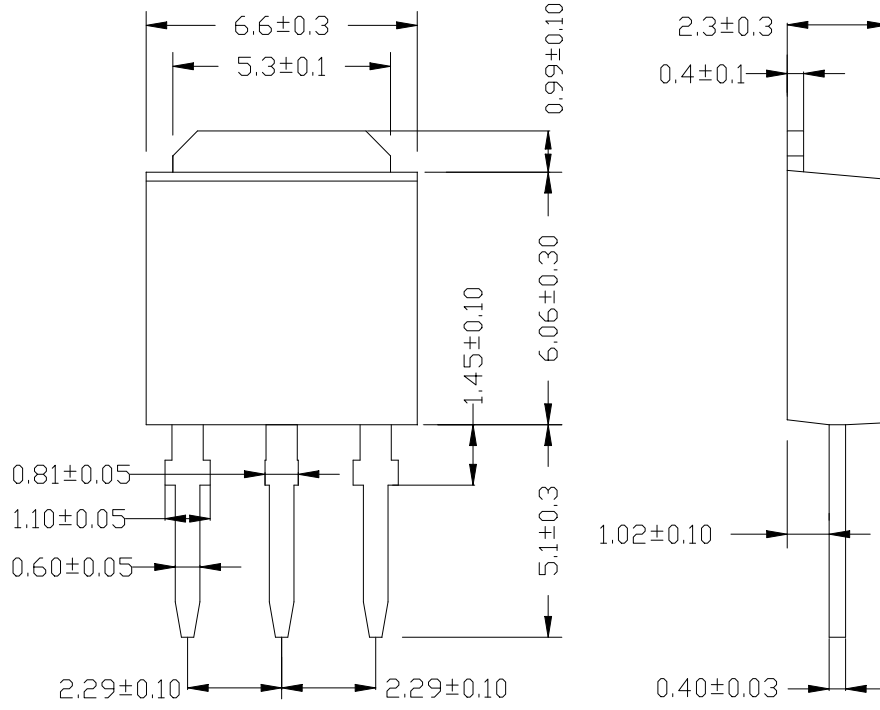
Typical Electrical and Thermal Characteristics

Fig 12: Max. Transient Thermal Impedance



Package Information

T0-251S



T0-252S

