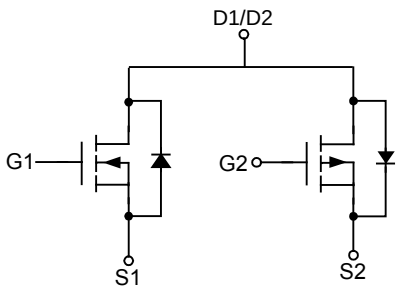
■ PRODUCT CHARACTERISTICS

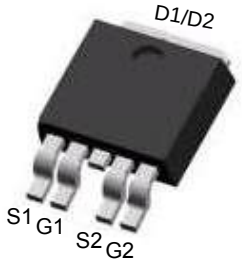
N-CHANNEL		P-CHANNEL	
V_{DSS}	30V	V_{DSS}	-30V
$R_{DS(ON)}$ Typ(@V_{GS}=10V)	10mΩ	$R_{DS(ON)}$ Typ(@V_{GS}=-10V)	13mΩ
$R_{DS(ON)}$ Typ(@V_{GS}=4.5V)	15mΩ	$R_{DS(ON)}$ Typ(@V_{GS}=-4.5V)	21mΩ
I_D	30A	I_D	-30A

Symbol



■ APPLICATIONS

* High efficiency switch mode power supplies
* Electronic lamp ballasts based on half bridge
* LED power supplies



■ FEATURE

* High Switching Speed
* Improved dv/dt capability

■ ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT3012D	TO-252-4L	2500 pieces/Reel

■ ABSOLUTE MAXIMUM RATINGS(T_A=25°C,unless otherwise specified)

Parameter	Symbol	N-CHANNEL	P-CHANNEL	Unit
Drain-Source Voltage	V_{DSS}	30	-30	V
Gate-Source Voltage	V_{GSS}	±20	±20	V
Drain Current Continuous(@V_{GS}=±10V ,T_A=25°C)	I_D	30	-30	A
Drain Current Pulsed	I_{DM}	120	-120	A
Power Dissipation	P_D	24		W
Junction Temperature	T_J	+150		°C
Storage Temperature	T_{STG}	-55~ +150		°C

■ THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	R_{thJC}	5.2	°C/W

■ N-CHANNEL ELECTRICAL CHARACTERISTICS(T_C=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain to Source Breakdown Voltage	V_{DSS}	V_{GS}=0V,I_D=-250μA	30	-	-	V
Drain to Source Leakage Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V	-	-	-1	μA
Gate to Source Forward Leakage	$I_{GSS(F)}$	V_{GS}=+20V,V_{DS}=0V	-	-	100	nA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	V_{GS}=-20V ,V_{DS}=0V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=10A	-	10	15	mΩ
		V_{GS}=4.5V,I_D=5 A	-	15	22	mΩ
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250μA	1	1.75	2.5	V
Dynamic characteristics						
Gate Resistance	R_g	V_{GS}=0V,V_{DS}=0V ,f=1.0MHz	-	2.7	-	Ω
Forward Transconductance	g_{fs}	V_{DS}=5V,I_D=5 A	-	9	-	S
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V f=1.0MHz	-	840	-	pF
Output Capacitance	C_{oss}		-	120	-	pF
Reverse Transfer Capacitance	C_{rss}		-	77	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	V_{GS}=10V, V_{DS}=15V, I_D=5 A,R_G=3Ω	-	5	-	ns
Rise Time	t_r		-	28	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	15	-	ns
Fall Time	t_f		-	2	-	ns
Total Gate Charge	Q_g	I_D=5 A, V_{DS}=15V V_{GS}=10V	-	10	-	nC
Gate to Source Charge	Q_{gs}		-	1.8	-	nC
Gate to Drain("Miller") Charge	Q_{gd}		-	2.1	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I_S		-	-	30	A
Maximum Pulsed Current(Body Diode)	I_{SM}		-	-	120	A
Diode Forward Voltage	V_{SD}	I_{SD}=5A, V_{GS}=0V	-	0.81	1.2	V

■ P-CHANNEL ELECTRICAL CHARACTERISTICS(T_C=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain to Source Breakdown Voltage	V_{DSS}	V_{GS}=0V,I_D=-250μA	-30	-	-	V
Drain to Source Leakage Current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V	-	-	-1	μA
Gate to Source Forward Leakage	$I_{GSS(F)}$	V_{GS}=+20V,V_{DS}=0V	-	-	100	nA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	V_{GS}=-20V ,V_{DS}=0V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-10A	-	13	16	mΩ
		V_{GS}=-4.5V,I_D=-5 A	-	21	27	mΩ
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=-250μA	-1	-1.6	-2.5	V
Dynamic characteristics						
Gate Resistance	R_g	V_{GS}=0V,V_{DS}=0V ,f=1.0MHz	-	16.7	-	Ω
Forward Transconductance	g_{fs}	V_{DS}=-5V,I_D=-5A	-	12	-	S
Input Capacitance	C_{iss}	V_{DS}=-20V,V_{GS}=0V f=1.0MHz	-	940	-	pF
Output Capacitance	C_{oss}		-	144	-	pF
Reverse Transfer Capacitance	C_{rss}		-	120	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	V_{GS}=-10V,V_{DS}=-15V, I_D=-5A,R_G=3Ω	-	5	-	ns
Rise Time	t_r		-	22	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	61	-	ns
Fall Time	t_f		-	55	-	ns
Total Gate Charge	Q_g	I_D=-5A, V_{DS}=-15V V_{GS}=-10V	-	24	-	nC
Gate to Source Charge	Q_{gs}		-	4	-	nC
Gate to Drain("Miller") Charge	Q_{gd}		-	5	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I_S		-	-	-30	A
Maximum Pulsed Current(Body Diode)	I_{SM}		-	-	-120	A
Diode Forward Voltage	V_{SD}	I_{SD}=-5A, V_{GS}=0V	-	-0.83	-1.2	V

■ N-CHANNEL TYPICAL CHARACTERISTICS

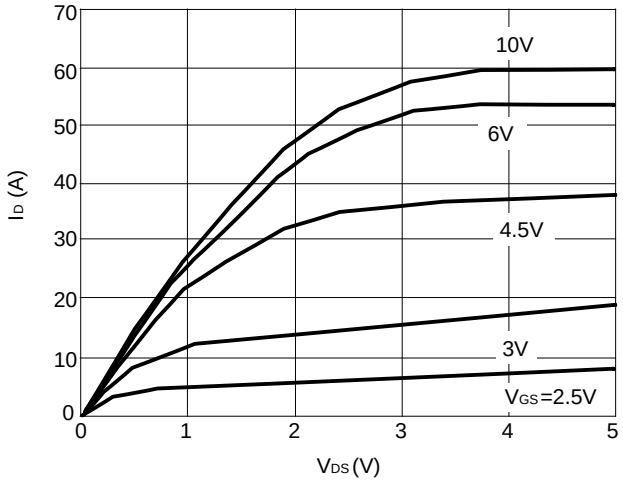


Figure 1: Output Characteristics

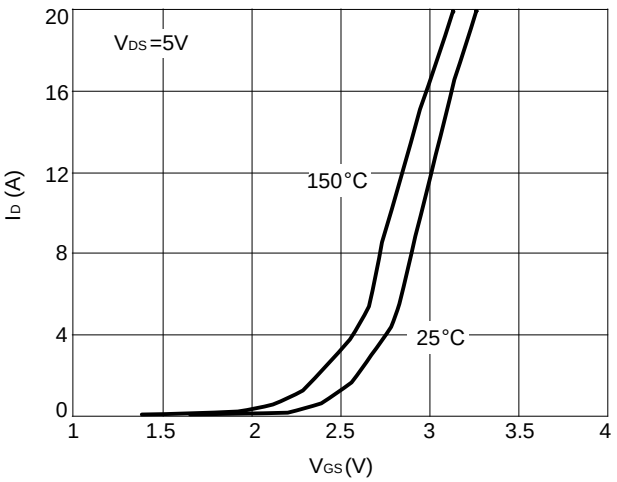


Figure 2: Typical Transfer Characteristics

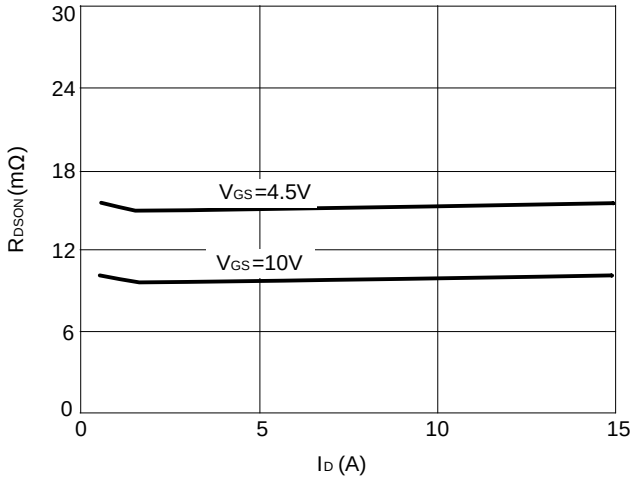


Figure 3: On-Resistance vs. Drain Current

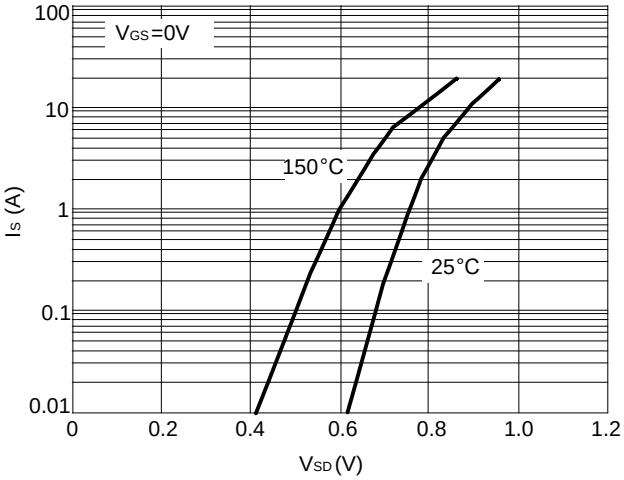


Figure 4: Body Diode Characteristics

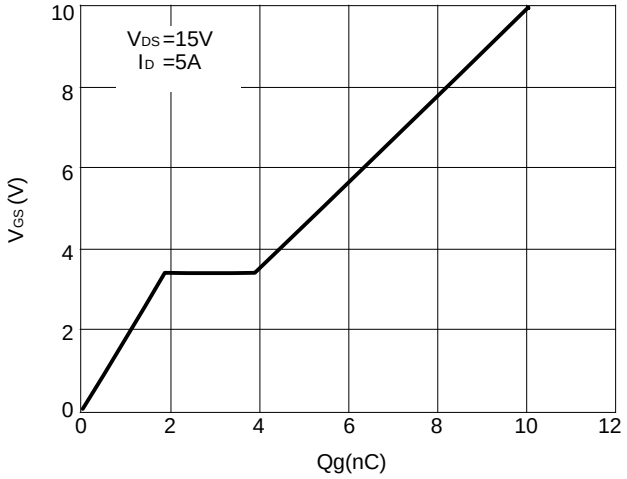


Figure 5: Gate Charge Characteristics

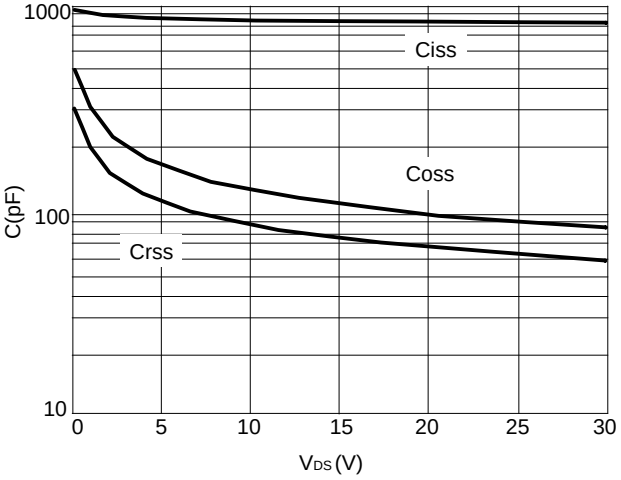


Figure 6: Capacitance Characteristics

■ N-CHANNEL TYPICAL CHARACTERISTICS(Cont.)

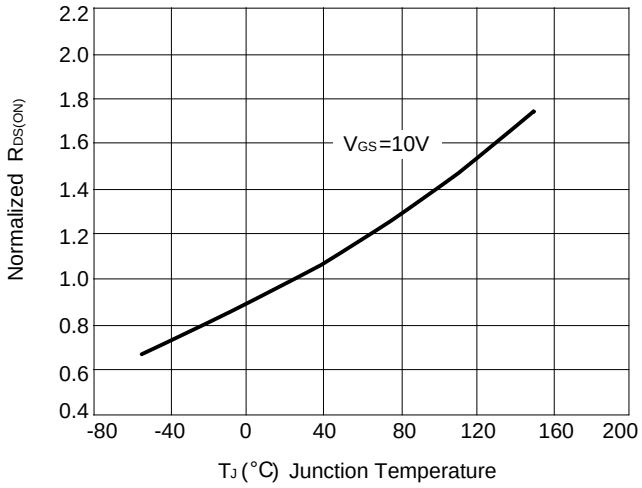


Figure 7: Normalized on Resistance vs. Junction Temperature

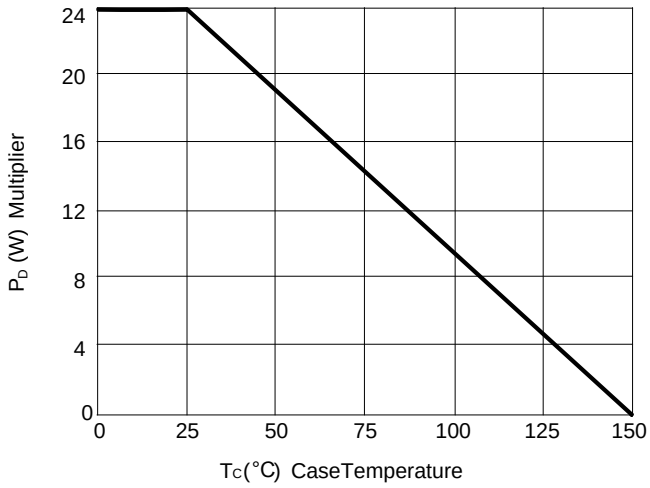


Figure 8: Power De-rating

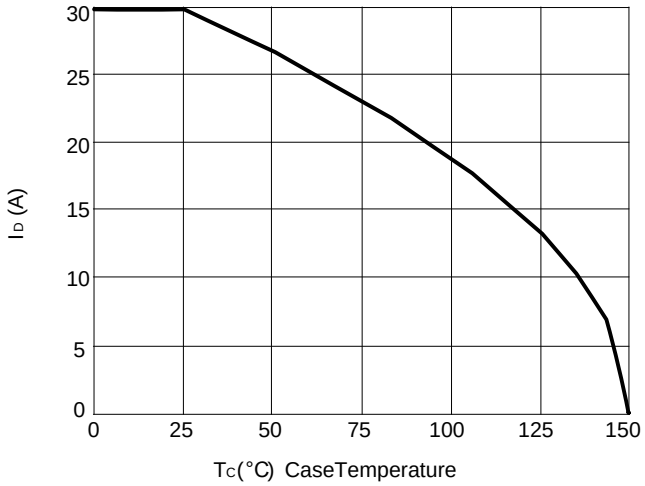


Figure 9: Current De-rating

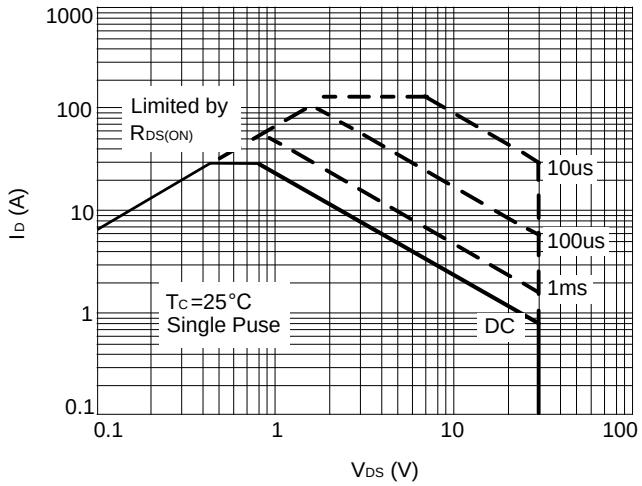


Figure 10: Maximum Safe Operating Area

■ P-CHANNEL TYPICAL CHARACTERISTICS

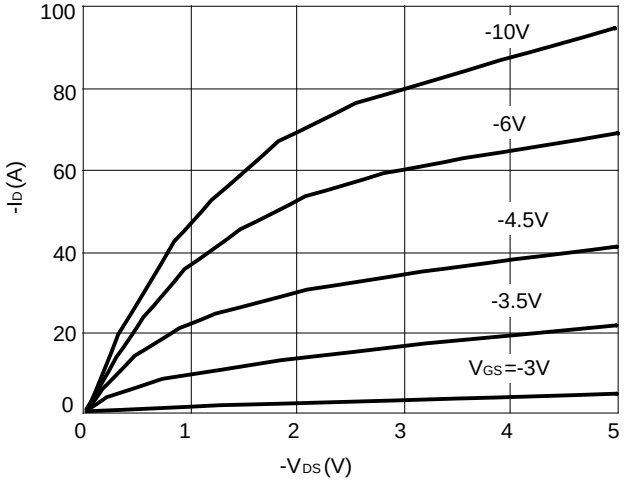


Figure 1: Output Characteristics

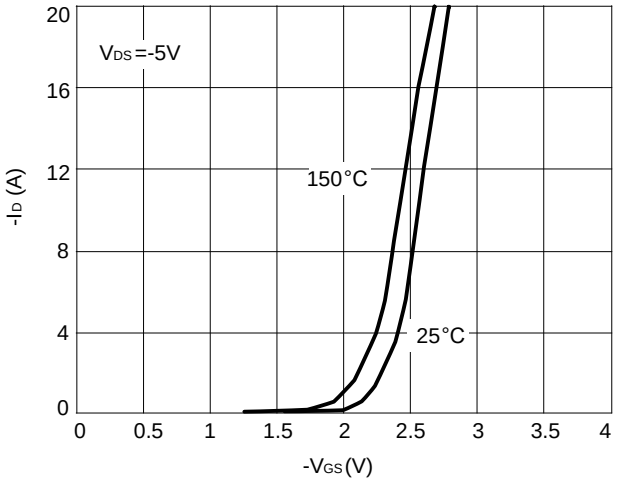


Figure 2: Typical Transfer Characteristics

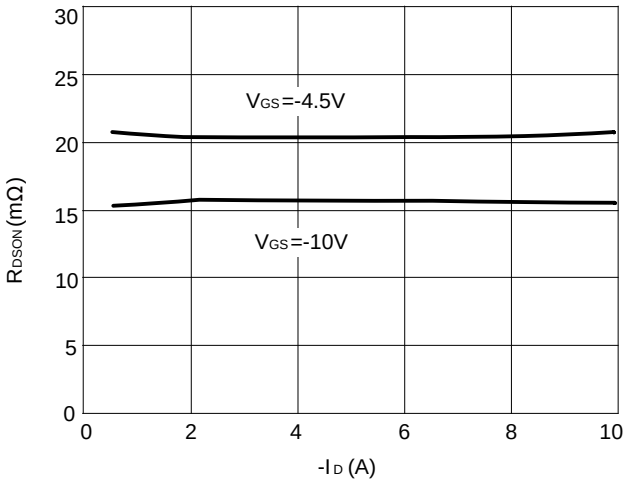


Figure 3: On-Resistance vs. Drain Current

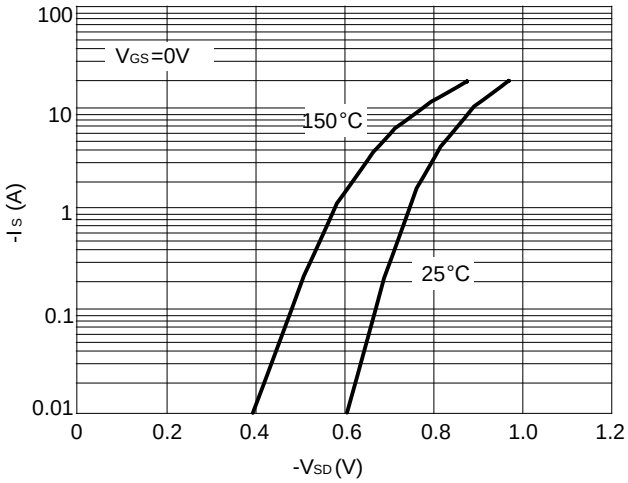


Figure 4: Body Diode Characteristics

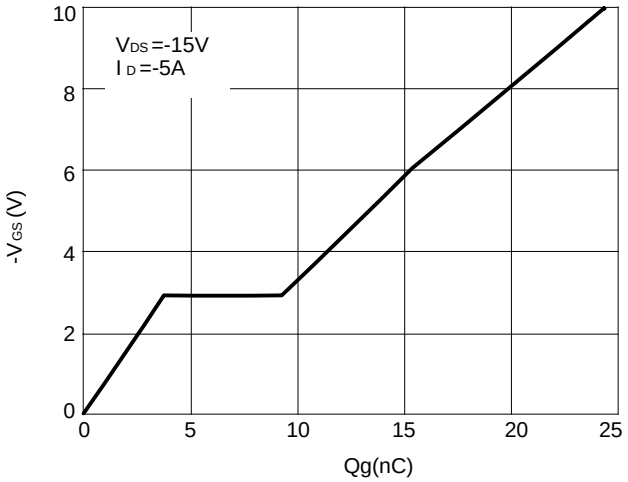


Figure 5: Gate Charge Characteristics

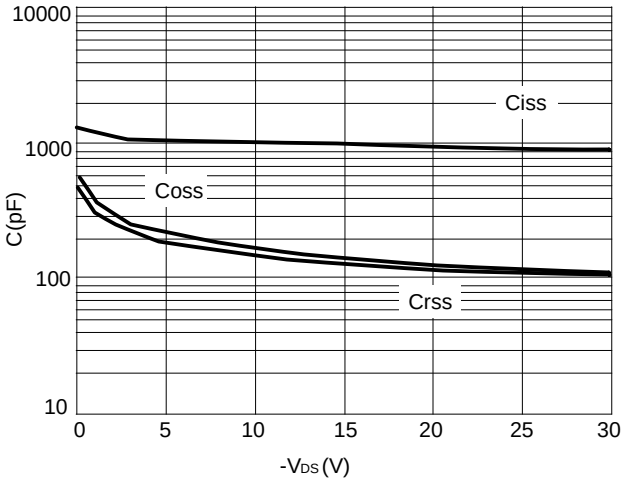


Figure 6: Capacitance Characteristics

■ P-CHANNEL TYPICAL CHARACTERISTICS(Cont.)

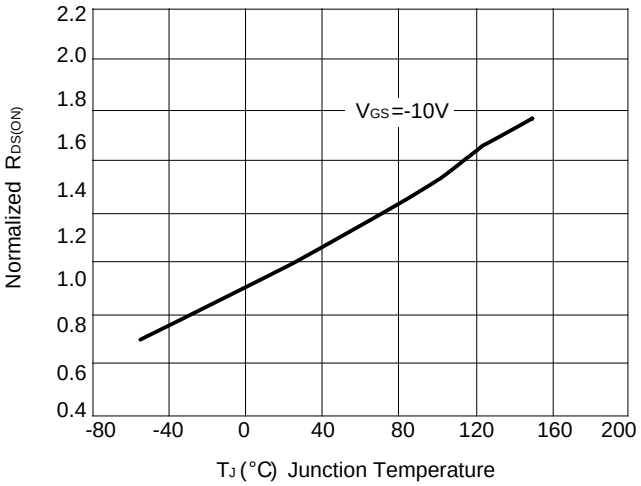


Figure 7: Normalized on Resistance vs. Junction Temperature

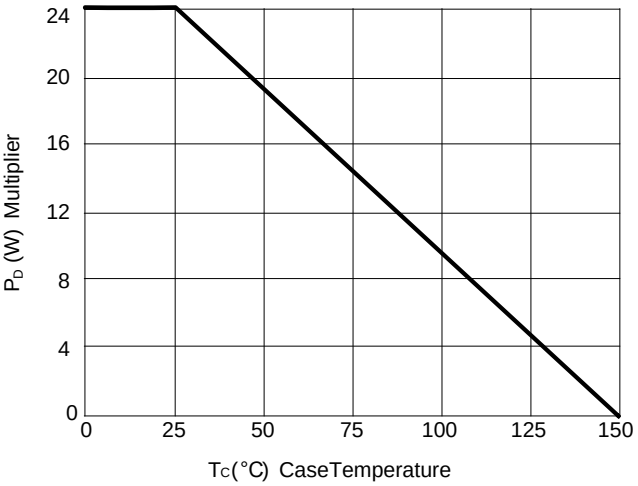


Figure 8: Power De-rating

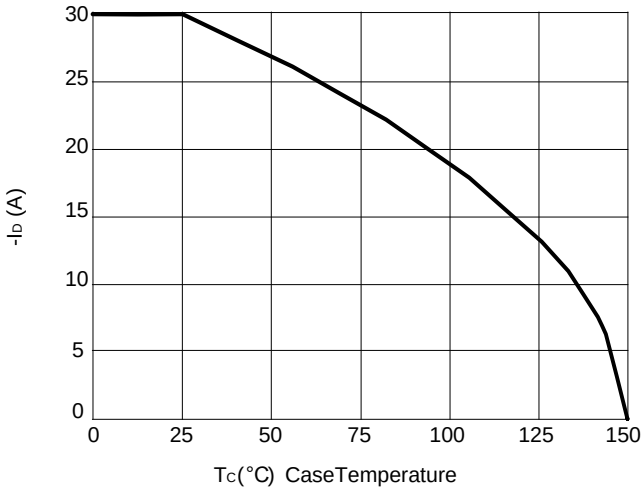


Figure 9: Current De-rating

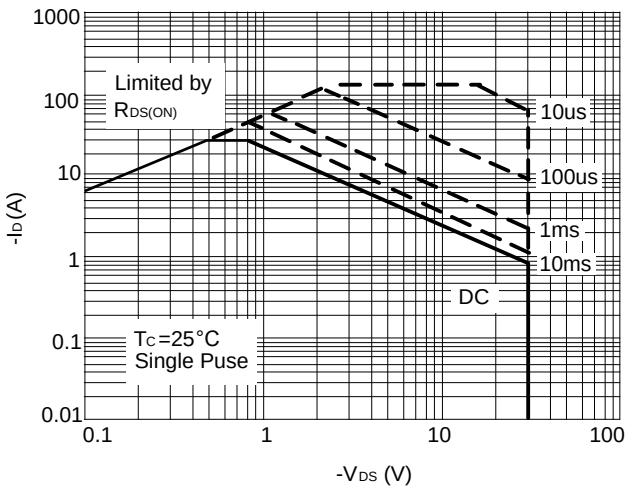


Figure 10: Maximum Safe Operating Area

■ TO-252-4L PACKAGE OUTLINE DIMENSIONS