

PRODUCT CHARACTERISTICS

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

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

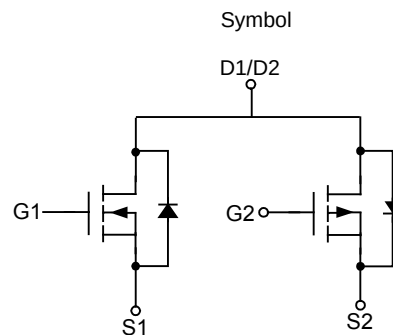
Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT3012D	TO-252-4L	2500 pieces/Reel

ABSOLUTE MAXIMUM RATINGS($T_A=25^{\circ}C$, 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(@ $V_{GS}=\pm 10V, T_A=25^{\circ}C$)	I_D	30	-30	A
Drain Current Pulsed	I_{DM}	120	-120	A
Power Dissipation	P_D	24		W
Junction Temperature	T_J	+150		$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150		$^{\circ}C$

THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	R_{thJC}	5.2	$^{\circ}C/W$



■ N-CHANNEL ELECTRICAL CHARACTERISTICS($T_c=25^{\circ}\text{C}$, 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 =10 A	-	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($T_C=25^{\circ}\text{C}$, 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

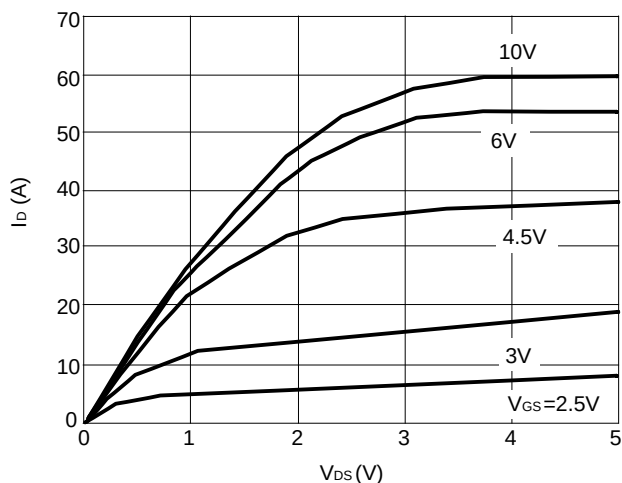


Figure 1: Output Characteristics

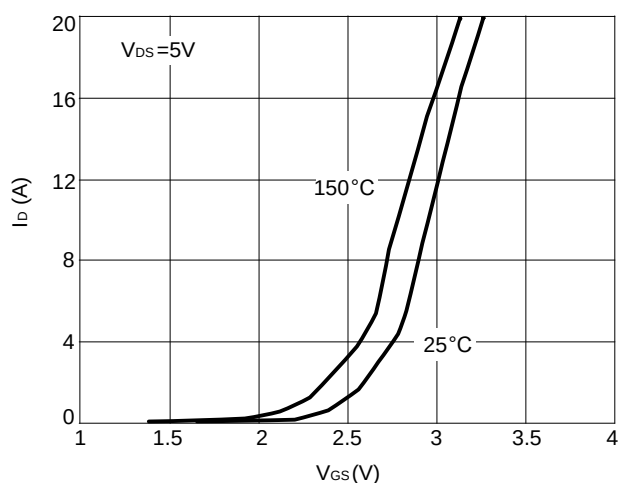


Figure 2: Typical Transfer Characteristics

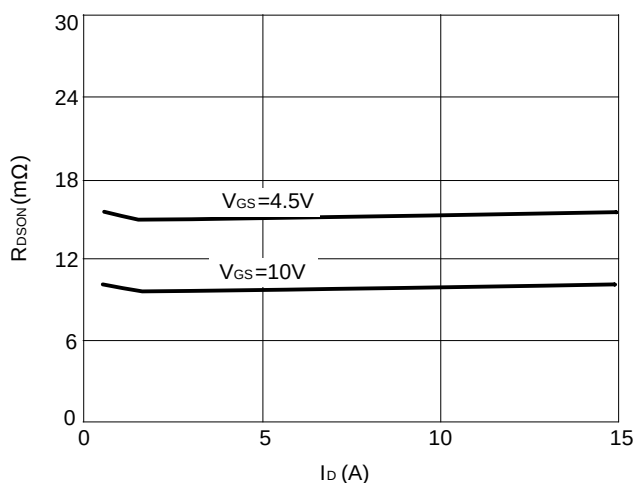


Figure 3: On-Resistance vs. Drain Current

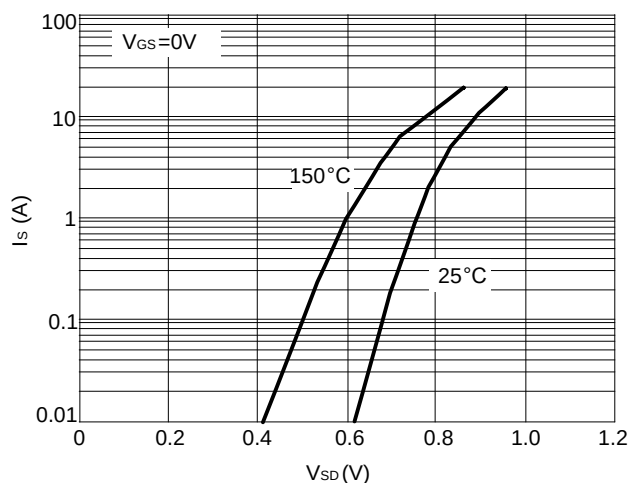


Figure 4: Body Diode Characteristics

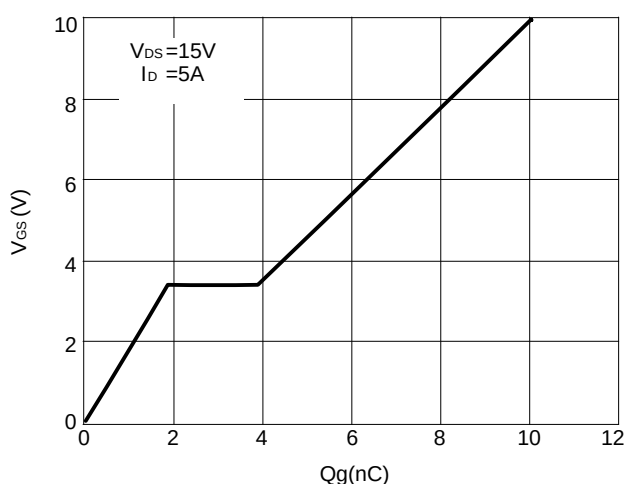


Figure 5: Gate Charge Characteristics

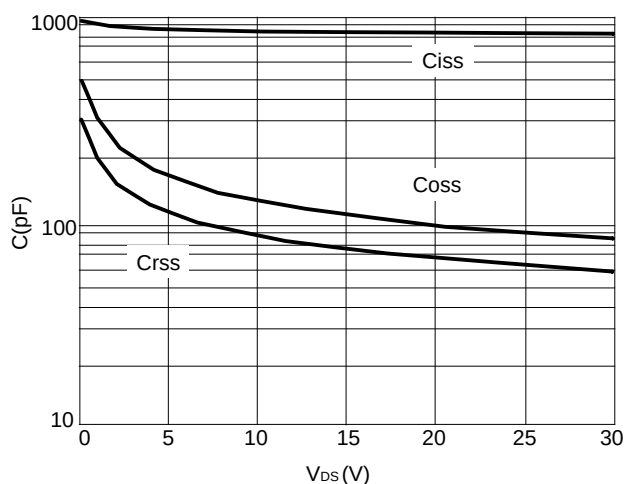


Figure 6: Capacitance Characteristics

■ N-CHANNEL TYPICAL CHARACTERISTICS(Cont.)

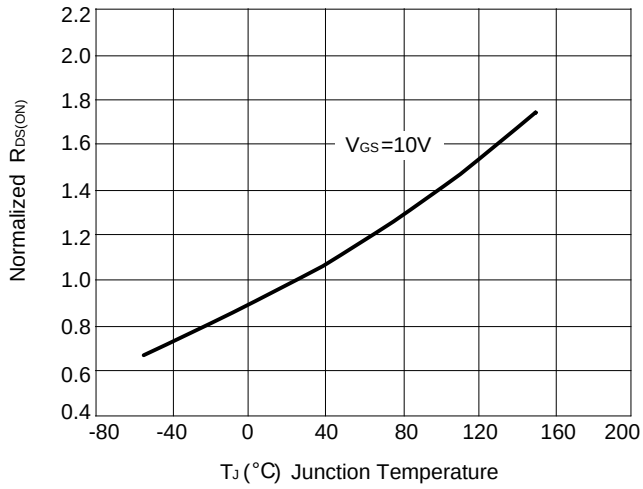


Figure 7: Normalized on Resistance vs. Junction Temperature

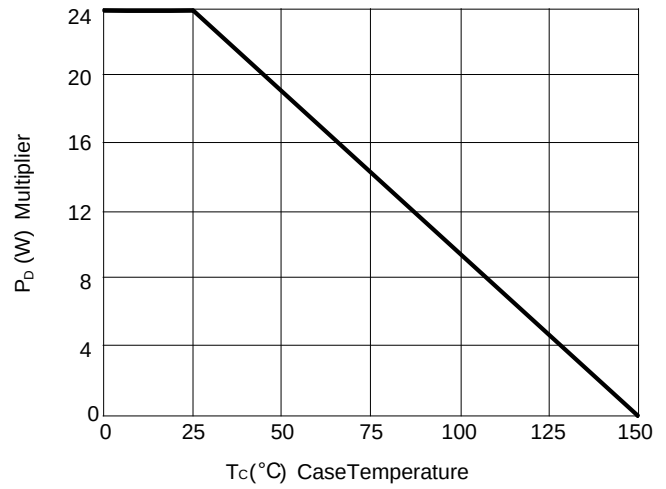


Figure 8: Power De-rating

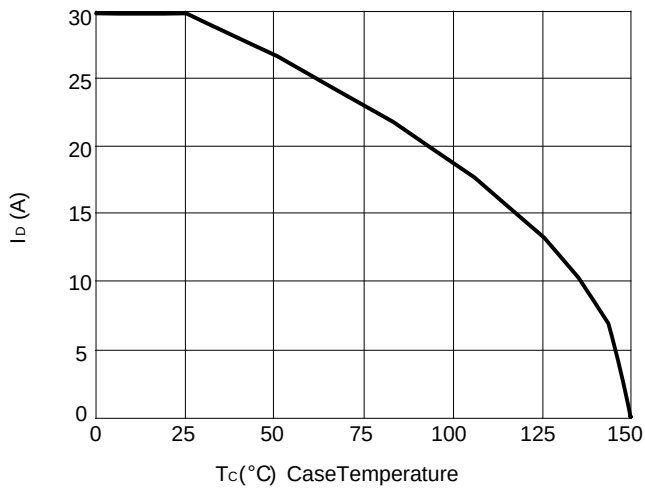


Figure 9: Current De-rating

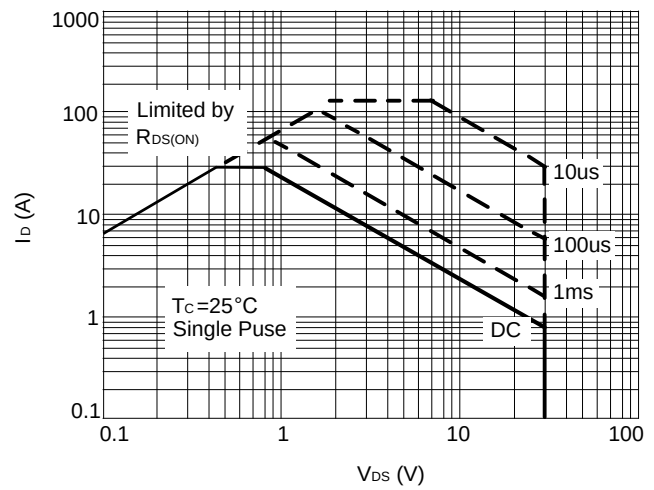


Figure 10: Maximum Safe Operating Area

P-CHANNEL TYPICAL CHARACTERISTICS

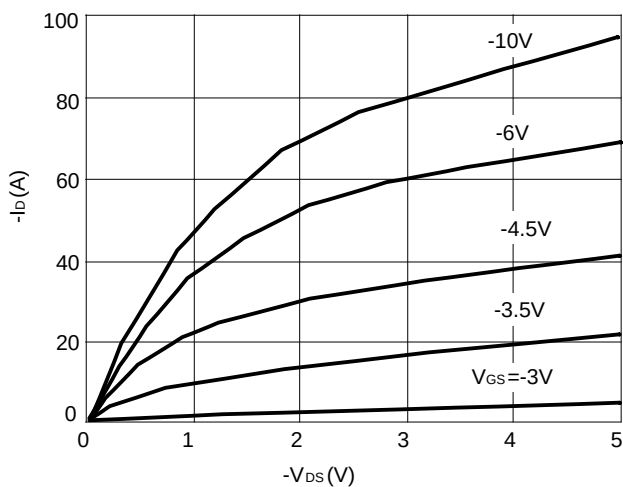


Figure 1: Output Characteristics

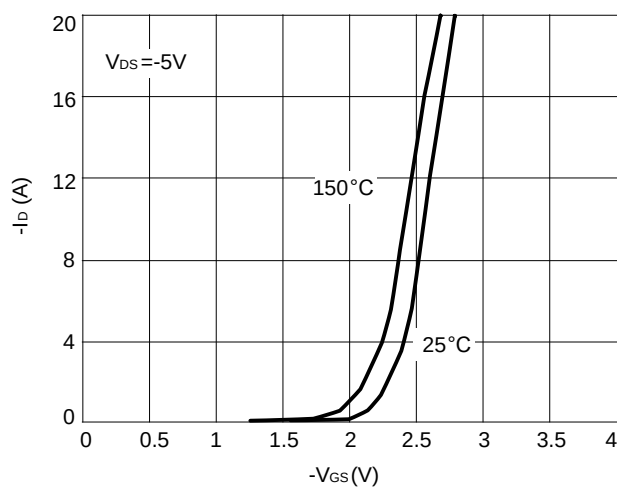


Figure 2: Typical Transfer Characteristics

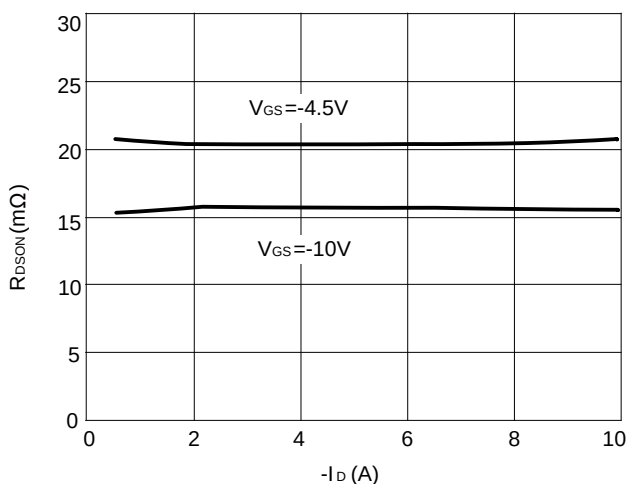


Figure 3: On-Resistance vs. Drain Current

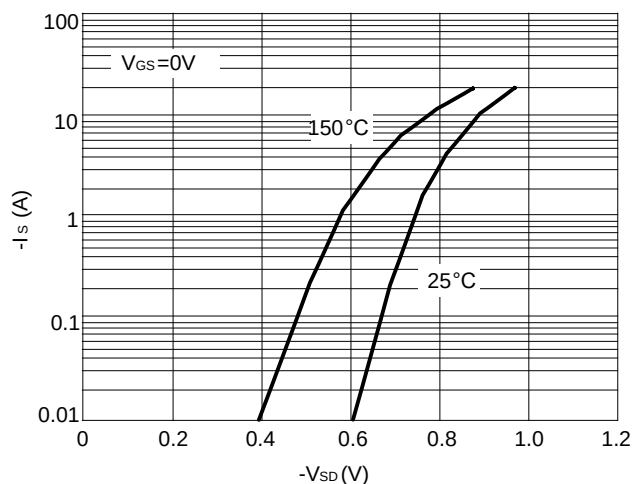


Figure 4: Body Diode Characteristics

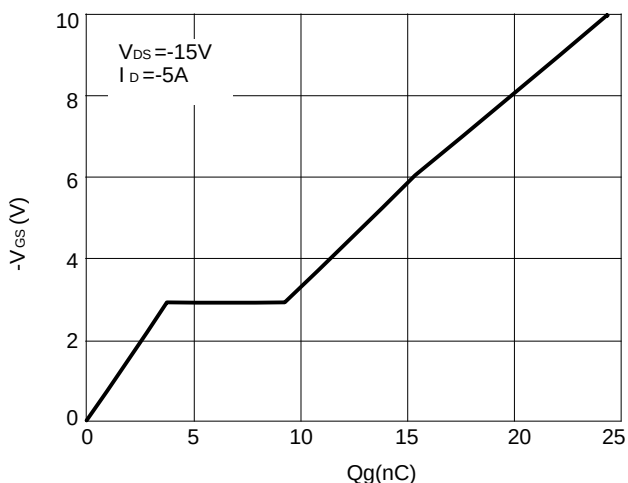


Figure 5: Gate Charge Characteristics

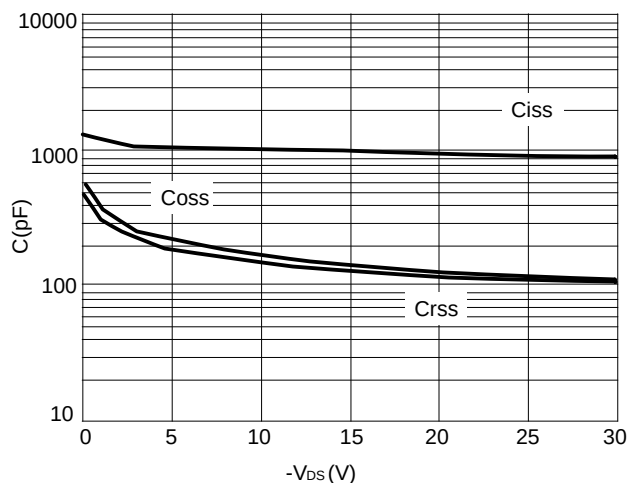


Figure 6: Capacitance Characteristics

■ P-CHANNEL TYPICAL CHARACTERISTICS(Cont.)

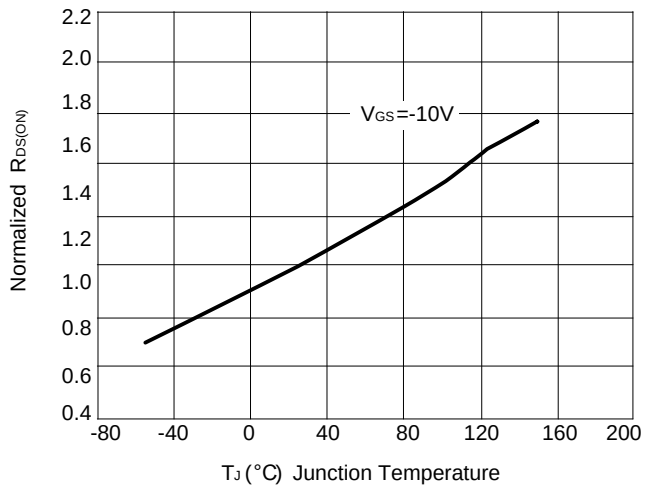


Figure 7: Normalized on Resistance vs. Junction Temperature

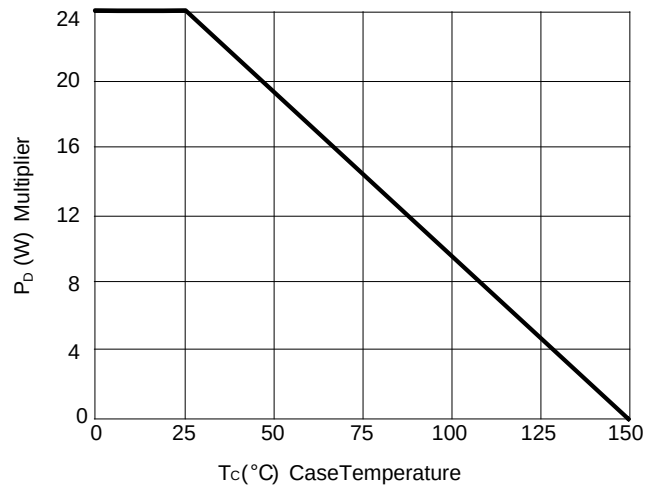


Figure 8: Power De-rating

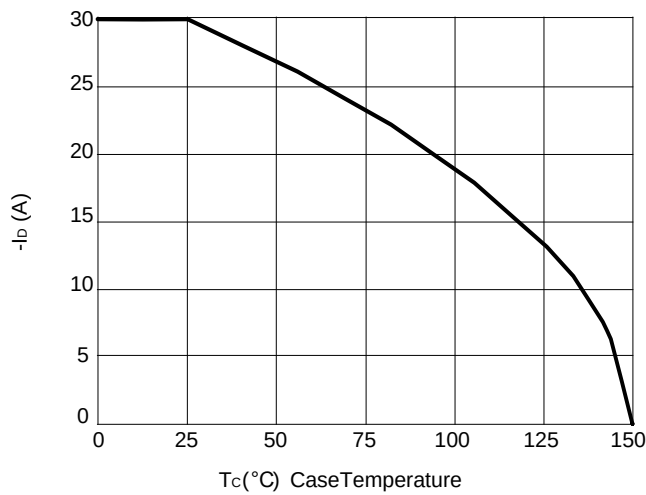


Figure 9: Current De-rating

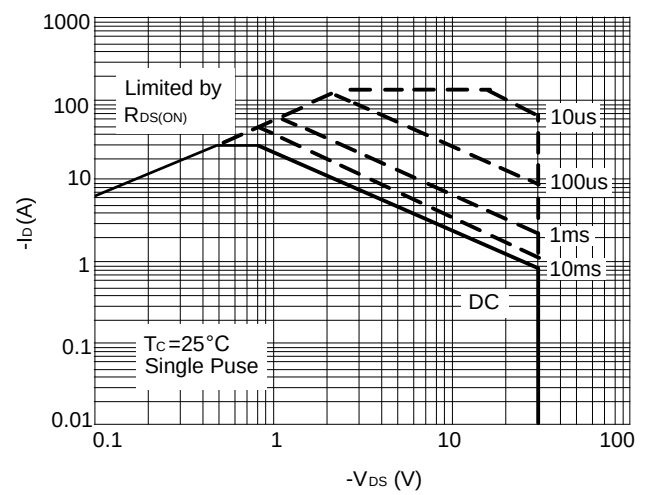


Figure 10: Maximum Safe Operating Area

■ TO-252-4L PACKAGE OUTLINE DIMENSIONS

