EVVOSEMI®

THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

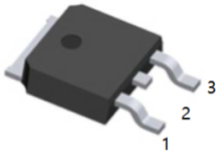
Product Specification

Domestic Part Number	NTD25P03LG
Overseas Part Number	NTD25P03LG
Equivalent Part Number	NTD25P03LG

P-Channel -30V (D-S) MOSFET

PRODUCT SUMMARY

- $V_{DS\ (V)}$ = -30V
- $R_{DS(ON)}$ < 43mΩ (V_{GS} = -4.5V)
- $R_{DS(ON)}$ < 52mΩ (V_{GS} = -2.5V)



1.G 2.D 3.S

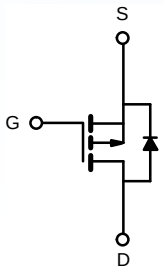
TO-252(DPAK) top view

FEATURES

- **Halogen-free**

APPLICATIONS

- Load Switch
- Notebook Adaptor Switch



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	- 30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	- 26	A
	T_C = 70 °C		- 21	
	T_A = 25 °C		- 12.9[a, b]	
	T_A = 70 °C		- 9.6[a, b]	
Pulsed Drain Current		I_{DM}	- 112	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	- 4.1	
	T_A = 25 °C		- 2.2[a, b]	
Avalanche Current	L = 0.1 mH	I_{AS}	- 20	
Single-Pulse Avalanche Energy		E_{AS}	20	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	25	W
	T_C = 70 °C		20	
	T_A = 25 °C		2.7[a, b]	
	T_A = 70 °C		1.7[a, b]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[a, c]	t ≤ 10 s	R_{thJA}	38	46	°C/W
Maximum Junction-to-Foot	Steady State	R_{thJF}	20	25	

Notes:
a. Surface mounted on 1" x 1" FR4 board.
b. t = 10 s.
c. Maximum under Steady State conditions is 85 °C/W.
d. Based on T_C = 25 °C.

P-Channel -30V (D-S) MOSFET

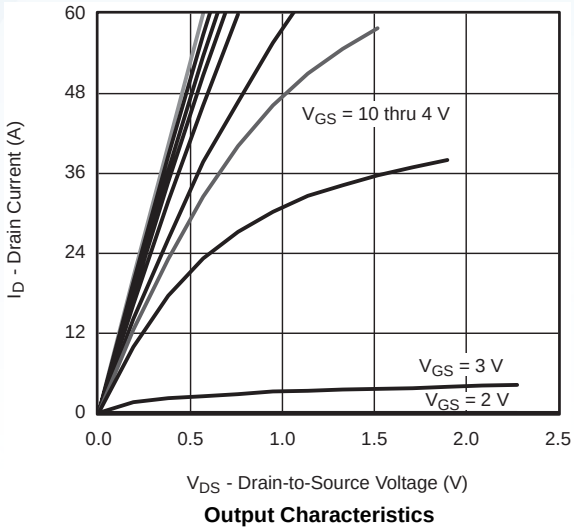
SPECIFICATIONS T_J = 25 °C, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = - 250 µA	- 30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 34		mV/ °C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			5.3		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1.0		- 2.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 25 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 30 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 30 V, V_{GS} = 0 V, T_J = 55 °C			- 5	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq$ - 10 V, V_{GS} = - 10 V	- 30			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 4.5 V, I_D = - 10 A		33	43	mΩ
		V_{GS} = - 2.5 V, I_D = - 8 A		46	52	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 10 V, I_D = - 10 A		28		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = - 15 V, V_{GS} = 0 V, f = 1 MHz		1350		pF
Output Capacitance	C_{oss}			255		
Reverse Transfer Capacitance	C_{rss}			190		
Total Gate Charge	Q_g	V_{DS} = - 15 V, V_{GS} = - 10 V, I_D = - 10 A		27	43	nC
		V_{DS} = - 15 V, V_{GS} = - 4.5 V, I_D = - 10 A		19	25	
Gate-Source Charge	Q_{gs}			6		
Gate-Drain Charge	Q_{gd}			12		
Gate Resistance	R_g	f = 1 MHz	0.5	2.2	4.4	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 1.5 Ω, $I_D \cong$ - 10 A, V_{GEN} = - 10 V, R_g = 1 Ω		13	25	ns
Rise Time	t_r			12	24	
Turn-Off DelayTime	$t_{d(off)}$			40	70	
Fall Time	t_f			9	18	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 1.5 Ω, $I_D \cong$ - 10 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		48	80	
Rise Time	t_r			92	160	
Turn-Off DelayTime	$t_{d(off)}$			34	60	
Fall Time	t_f			19	35	
Drain-Source Body Diode Characteristics						
Continous Source-Drain Diode Current	I_S	T_C = 25 °C			- 4.1	A
Pulse Diode Forward Current	I_{SM}				- 60	
Body Diode Voltage	V_{SD}	I_S = - 3 A, V_{GS} = 0 V		- 0.75	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 10 A, dI/dt = 100 A/µs, T_J = 25 °C		27	45	ns
Body Diode Reverse Recovery Charge	Q_{rr}			16	27	nC
Reverse Recovery Fall Time	t_a			12		ns
Reverse Recovery Rise Time	t_b			15		

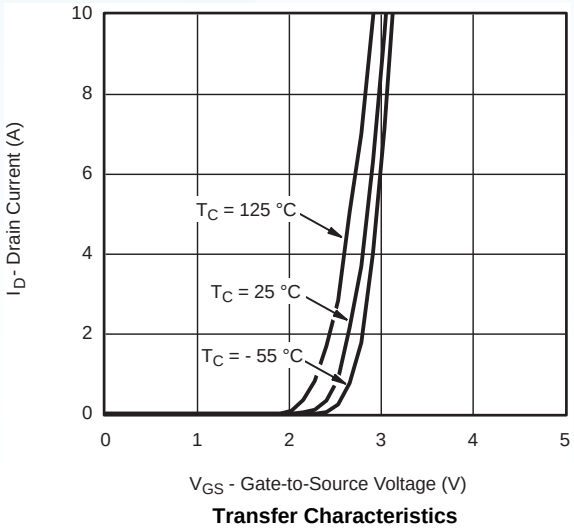
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

P-Channel -30V (D-S) MOSFET

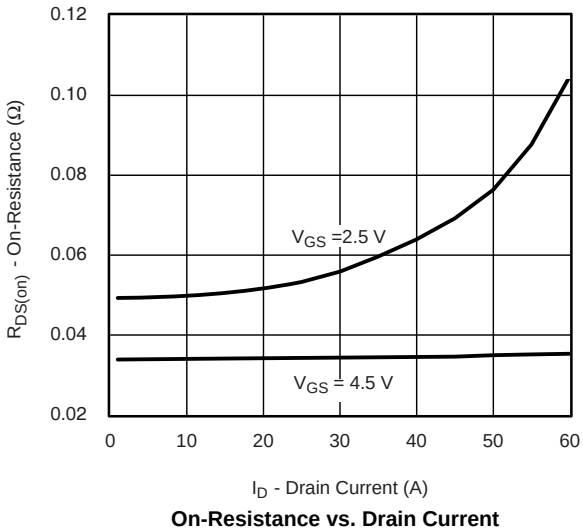
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



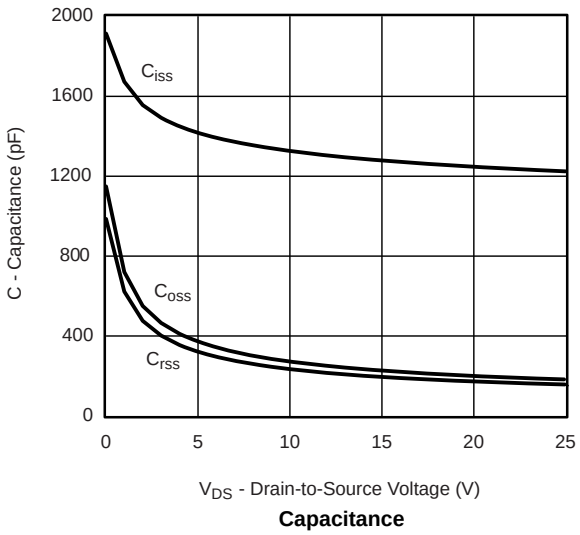
Output Characteristics



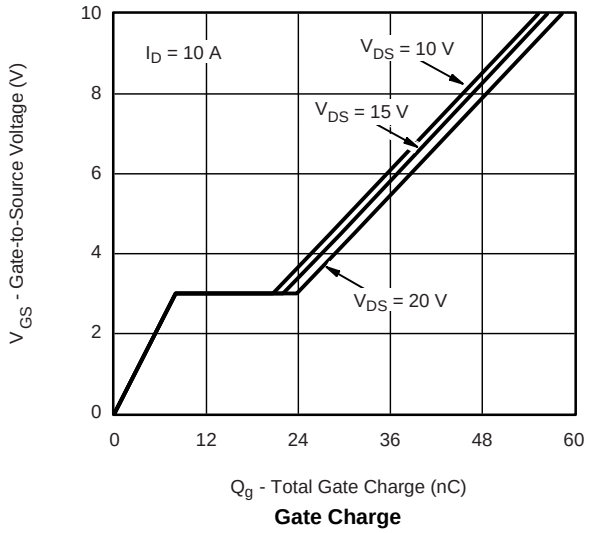
Transfer Characteristics



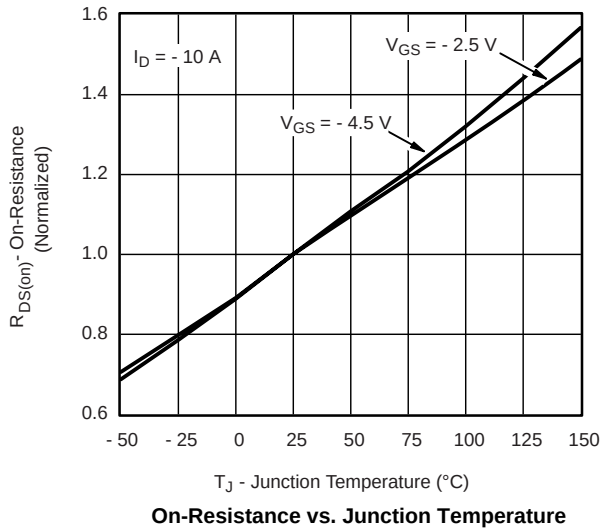
On-Resistance vs. Drain Current



Capacitance



Gate Charge



On-Resistance vs. Junction Temperature

P-Channel -30V (D-S) MOSFET

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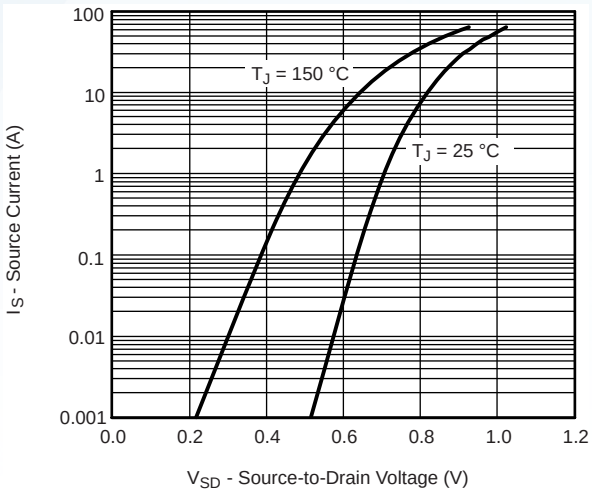
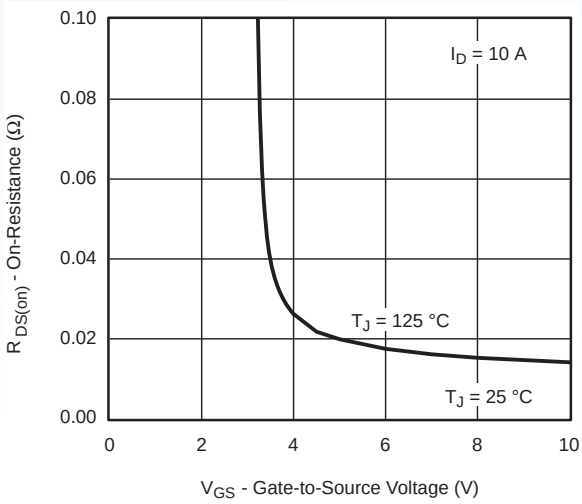
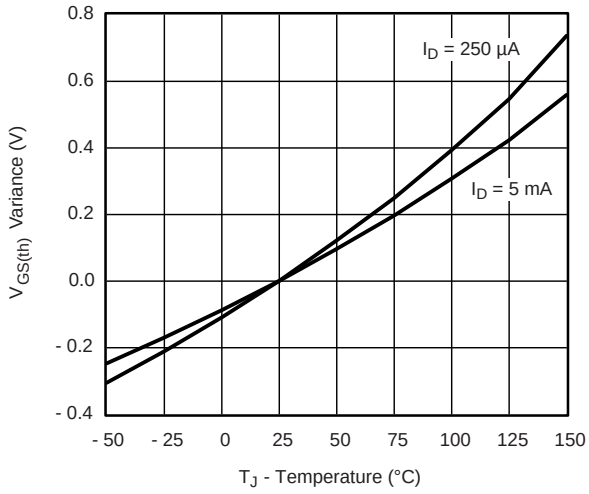


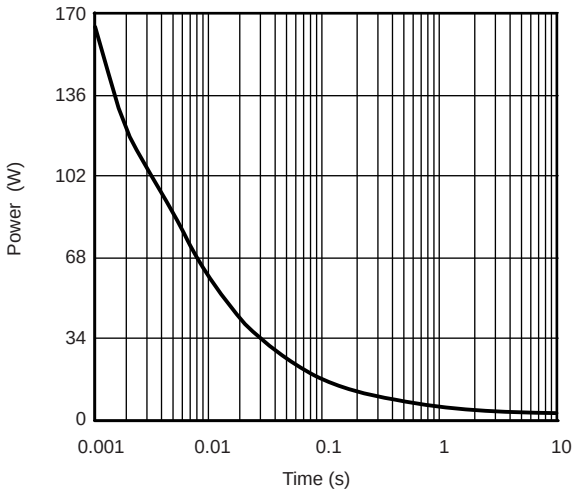
Source-Drain Diode Forward Voltage



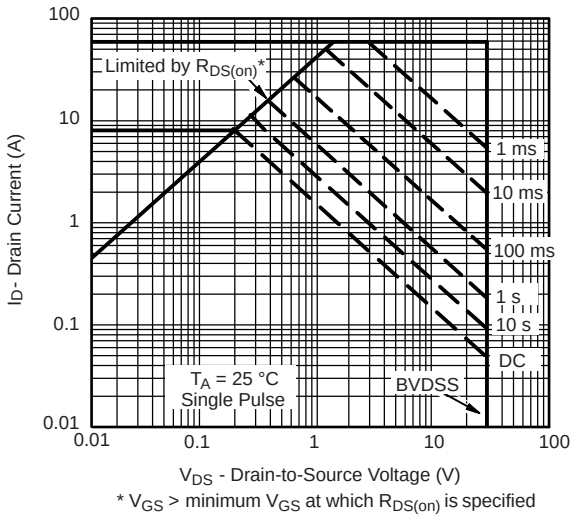
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient

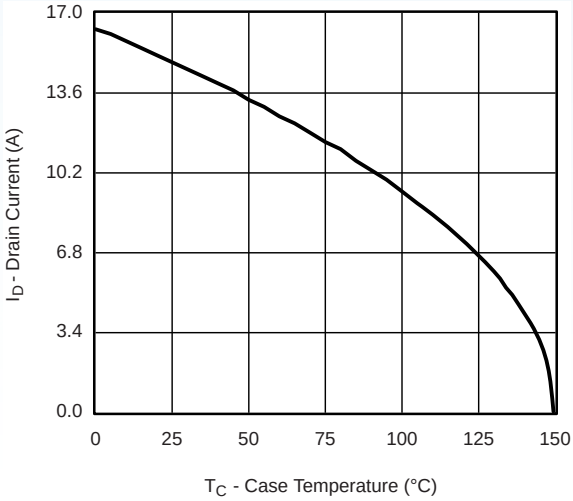


* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

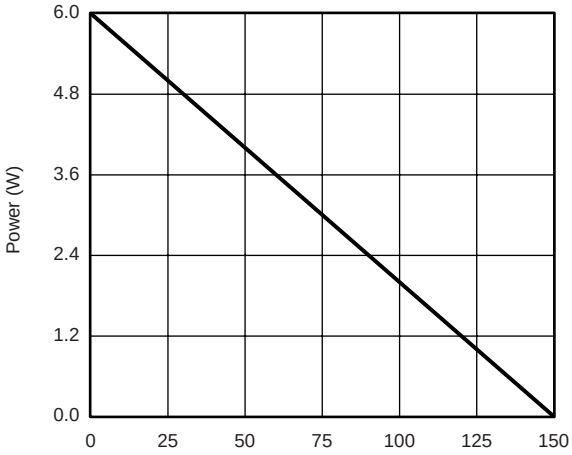
Safe Operating Area

P-Channel -30V (D-S) MOSFET

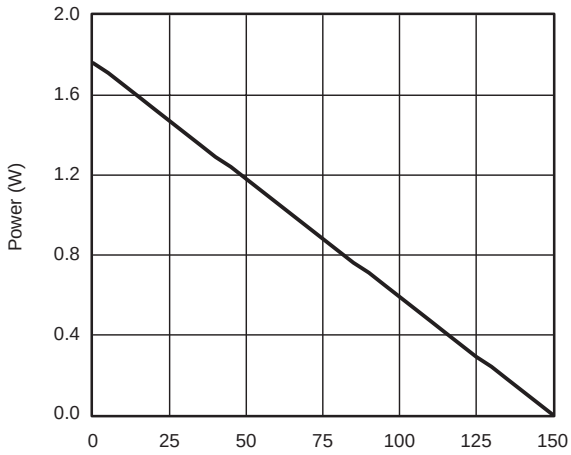
MOSFET TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Current Derating*



Power, Junction-to-Foot



Power Derating, Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

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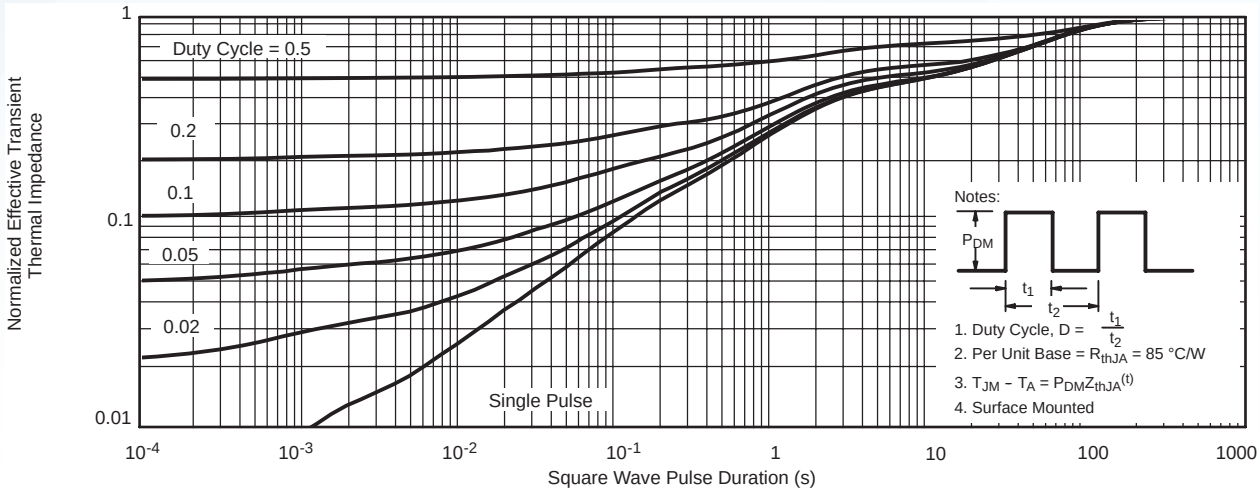
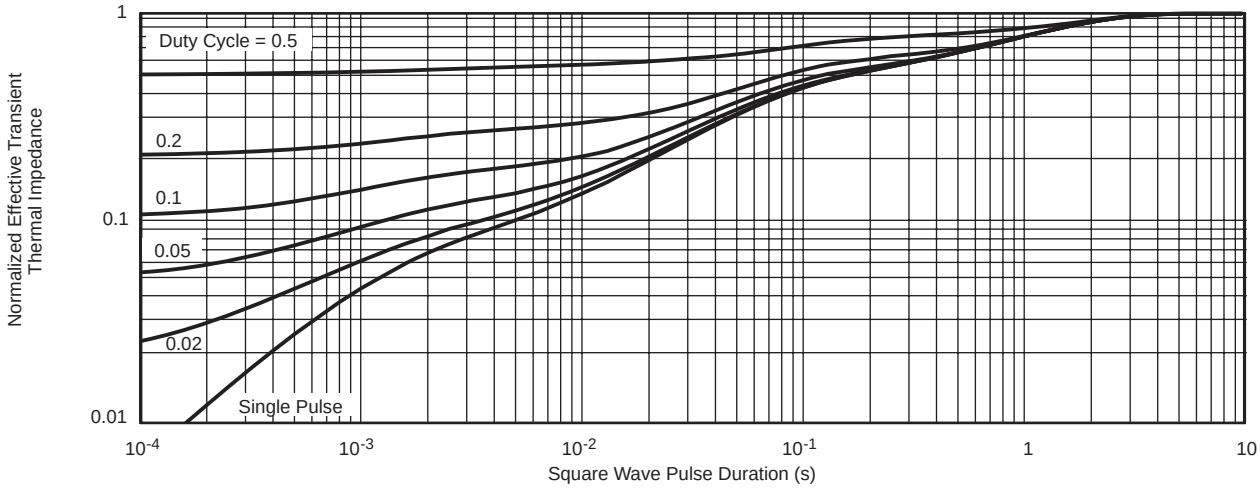


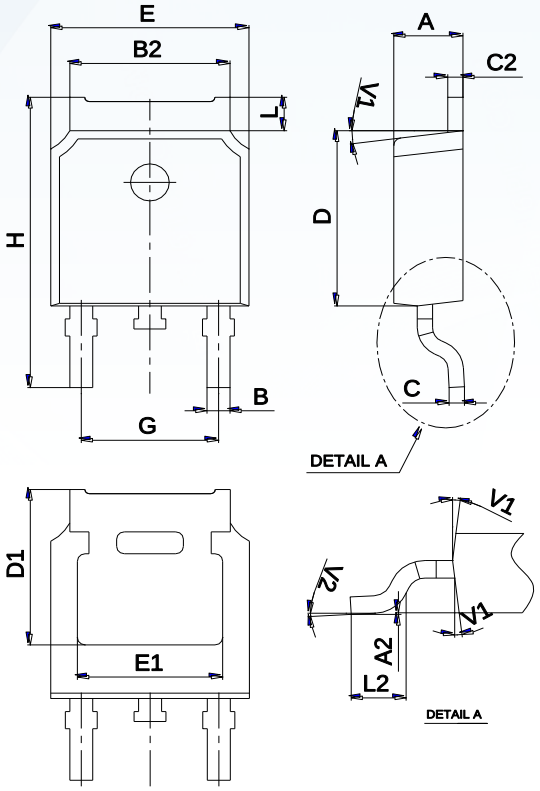
Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

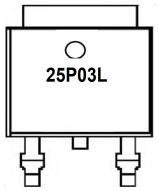
P-Channel -30V (D-S) MOSFET

Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
NTD25P03LG	TO-252	2500	Tape and reel

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