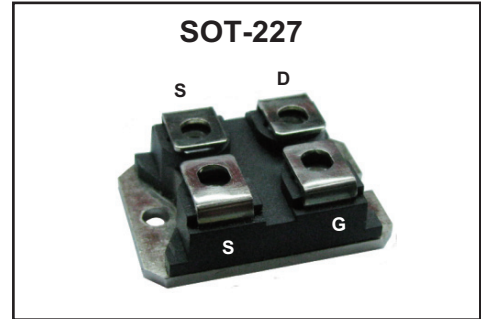
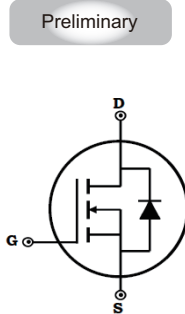




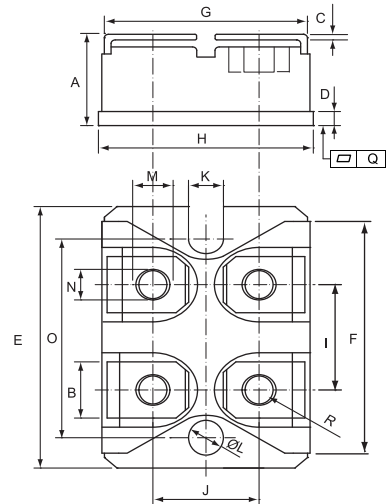
Silicon Carbide Enhancement Mode MOSFET

Features

- ◆ $V_{DSS} = 1200V$
- ◆ $R_{DS(ON)} < 20m\Omega @ V_{GS} = 20V$
- ◆ Fully Avalanche Rated
- ◆ Pb Free & RoHS Compliant
- ◆ Isolation Type Package
- ◆ Electrically Isolation base plate



Dimensions in inches and (millimeters)



Applications

- ◆ Solar Inverters
- ◆ Switch Mode Power Supplies
- ◆ Power Converters
- ◆ Battery Chargers
- ◆ Motor Drive

Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GS}	-5/+20	V
Drain Current-Continuous @ Tc = 25°C @ Tc = 100°C	I_D	160 110	A
Drain Current-Pulsed @ Tc = 25°C	I_{DM}	400	A
Maximum Power Dissipation	P_D	580	W
Storage Temperature Range	T_{STG}	-50 to +150	°C
Operating Junction Temperature Range	T_J	-50 to +150	°C
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.22	°C/W
Isolation Voltage (A.C. 1 minute)	V_{iso}	2500	V
Mounting torque (M4 Screw)	To heatsink To terminal	1.5 1.3	Nm

	DIMENSIONS			
	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.460	0.483	11.68	12.28
B	0.307	0.323	7.80	8.20
C	0.030	0.033	0.75	0.85
D	0.071	0.081	1.80	2.05
E	1.488	1.504	37.80	38.20
F	1.248	1.260	31.70	32.00
G	0.917	0.957	23.30	24.30
H	0.996	1.008	25.30	25.60
I	0.579	0.602	14.70	15.30
J	0.492	0.516	12.50	13.10
K	0.161	0.169	4.10	4.30
L	0.161	0.169	4.10	4.30
M	0.181	0.197	4.60	5.00
N	0.165	0.181	4.20	4.60
O	1.181	1.197	30.00	30.40
Q	-0.002	0.004	-0.05	0.10
R	M4*8			



Electrical Characteristics @ T_J =25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V _{GS} =0V , I _{DS} =100uA	1200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V _{GS} =0V , V _{DS} =1200V	-	-	200	uA
Gate-Body Leakage	I_{GSS}	V _{GS} =±20V , V _{DS} =0V	-	-	200	nA
ON Characteristics						
Gate Threshold Voltage	V_{TH}	V _{DS} =V _{GS} , I _{DS} =8mA	2.0	2.5	3.5	V
Drain-Source On-State Resistance	R_{DS(on)}	V _{GS} =20V , I _{DS} =100A	-	16	20	mΩ
Gate Resistance	R_G		-	1.6	2.9	Ω
Forward Transconductance	g_{fs}	V _{DS} =20V , I _D =100A ^{Note1}	-	30	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V _{DS} =800V V _{GS} =0V	-	6000	-	pF
Output Capacitance	C_{oss}	V _{AC} =25mV	-	368	-	
Reverse Transfer Capacitance	C_{rss}	Freq.=1MHz	-	80	-	
Turn-On Switching Energy	E_{on}	V _{DD} =800V , V _{GS} =-5V/+20V I _D =100A , R _{G(ext)} =5.1Ω	-	3.9	-	mJ
Turn-Off Switching Energy	E_{off}	Load=200μH , T _J =125°C	-	1.8	-	
Switching Characteristics						
Turn-On Delay Time	t_{d(on)}	V _{DD} =600V	-	41	-	ns
Rise Time	t_r	V _{GS} =20V	-	30	-	
Turn-Off Delay Time	t_{d(off)}	I _{DS} =150A	-	72	-	
Fall Time	t_f	R _G =2.5Ω	-	30	-	
Total Gate Charge at 10V	Q_g	V _{DS} =800V	-	360	-	nC
Gate to Source Charge	Q_{gs}	V _{GS} =20V	-	90	-	
Gate to Drain Charge	Q_{gd}	I _{DS} =100A	-	98	-	
Reverse Diode Characteristics						
Drain-Source Diode Forward Voltage	V_F	T _J =25°C , I _F =160A	-	-	6.5	V
Diode Continuous Forward Current	I_F		-	-	110	A
Diode Pulsed Current ^{Note1}	I_{F,pulse}		-	-	400	A
Reverse Recovery time	T_{RR}	I _F =0.5V , I _R =1.0A , I _{RR} =0.25A	-	-	185	ns

Notes:

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle > 2%.



Typical Characteristics

Figure 1. Maximum Power Dissipation (MOSFET) Derating vs. Case Temperature

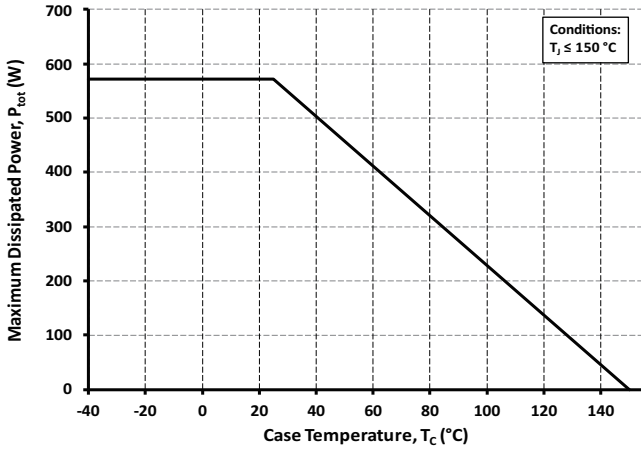


Figure 2. Continuous Drain Current (MOSFET) Derating vs. Case Temperature

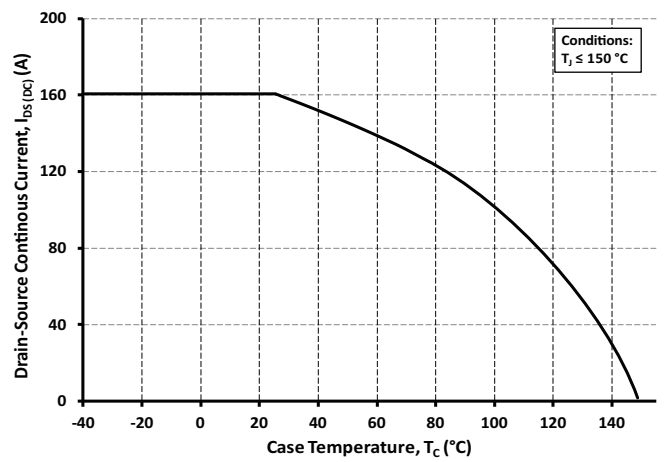


Figure 3. Maximum Power Dissipation (MOSFET) Derating vs. Case Temperature

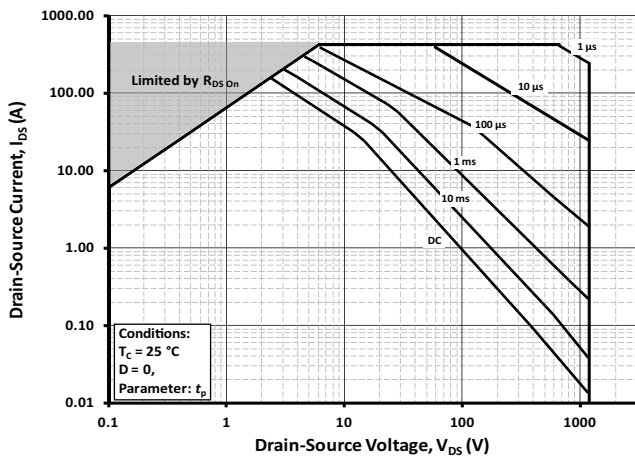


Figure 4. MOSFET Junction to Case Thermal Impedance

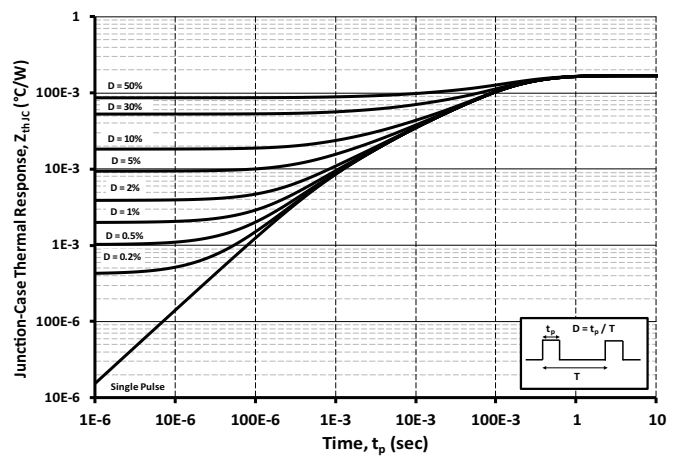


Figure 5. Output Characteristics T_j = 25 °C

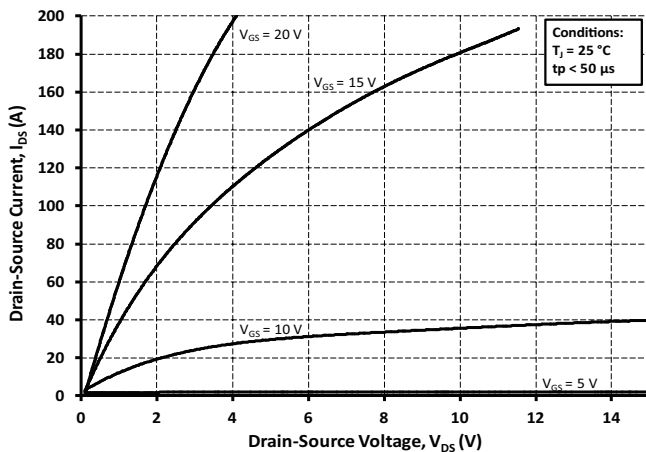
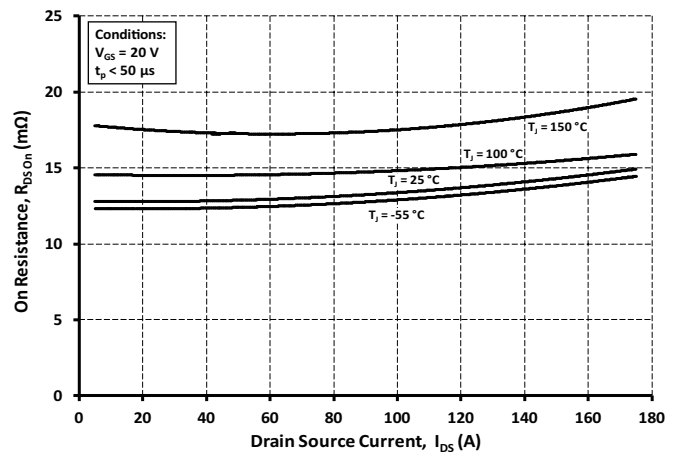


Figure 6. On-Resistance vs. Drain Current For Various Temperatures





Typical Characteristics

Figure 7. On-Resistance vs. Temperature For Various Gate-Source Voltage

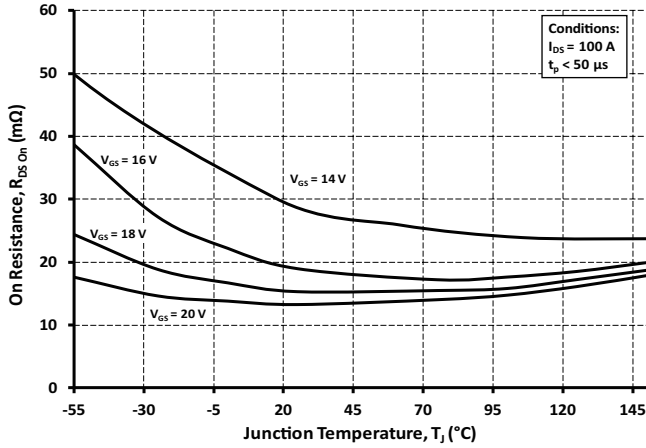


Figure 8. Threshold Voltage vs. Temperature

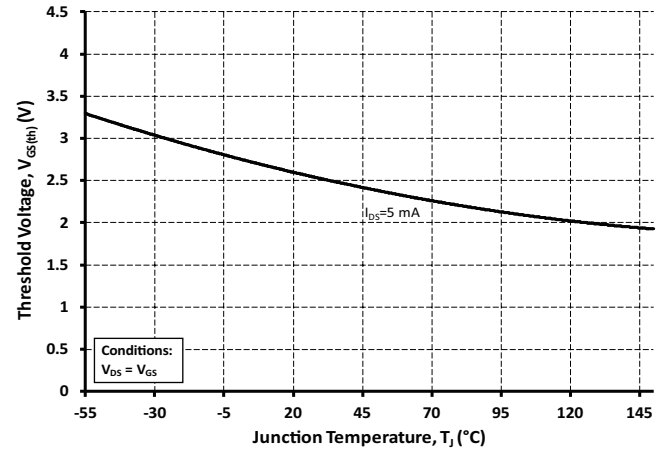


Figure 9. Transfer Characteristic for Various Junction Temperatures

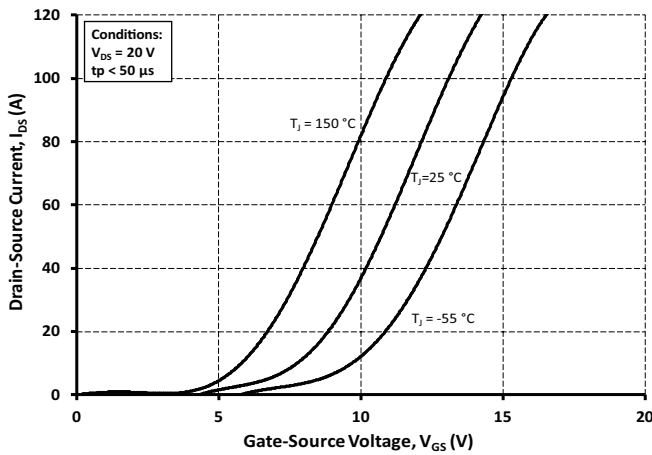


Figure 10. Capacitances vs. Drain-Source Voltage (0 - 1 kV)

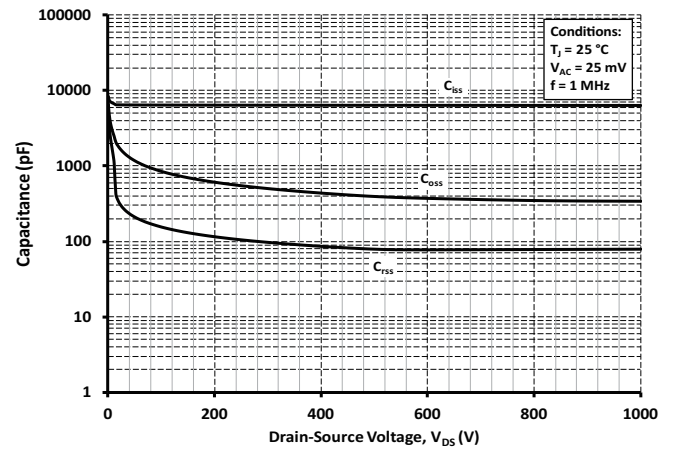


Figure 11. Typical forward characteristics of reverse diode

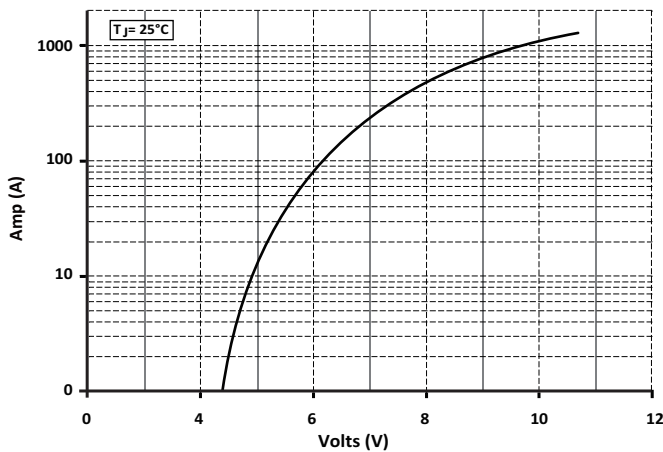
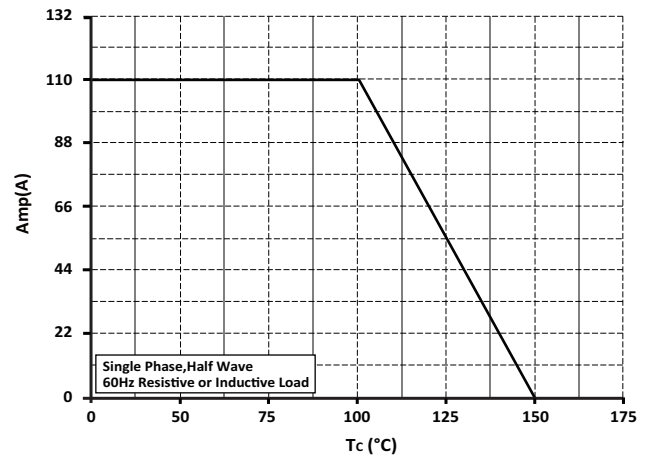


Figure 12. Forward derating curve of reverse diode





Typical Characteristics

Figure 13. Peak forward surge current of reverse diode

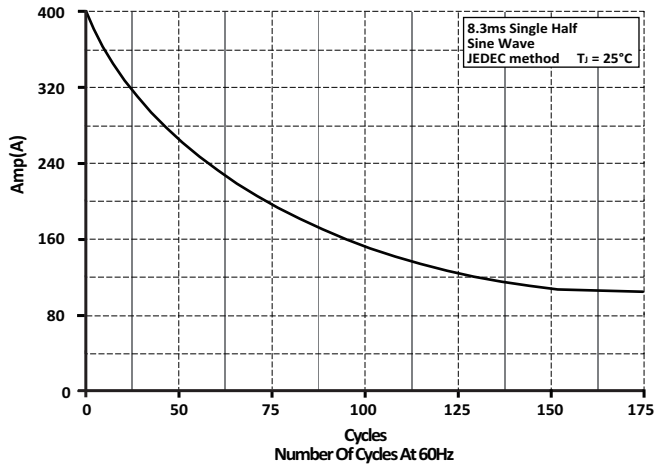


Figure 14. Typical reverse diode characteristics

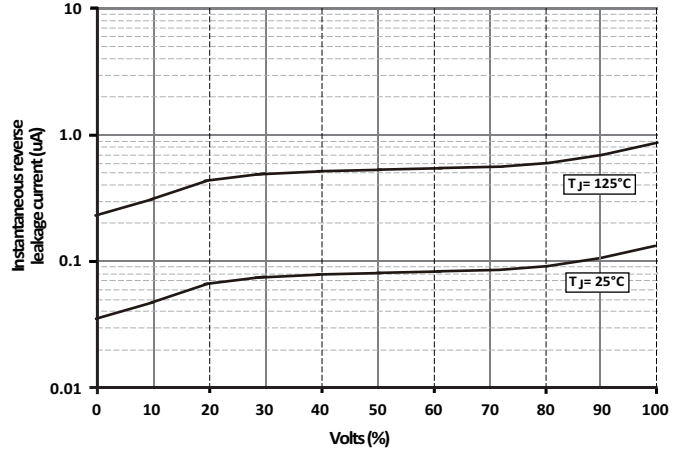


Figure 15. Gate Charge Characteristics

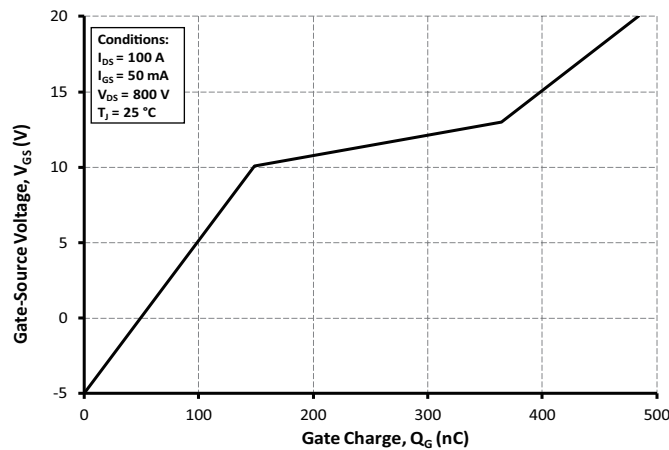


Figure 16. Inductive Switching Energy vs. Temperature

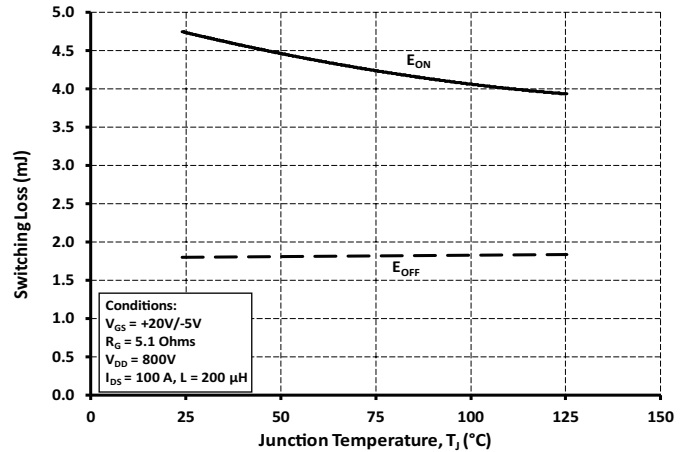


Figure 17. Timing vs. $R_{G(ext)}$

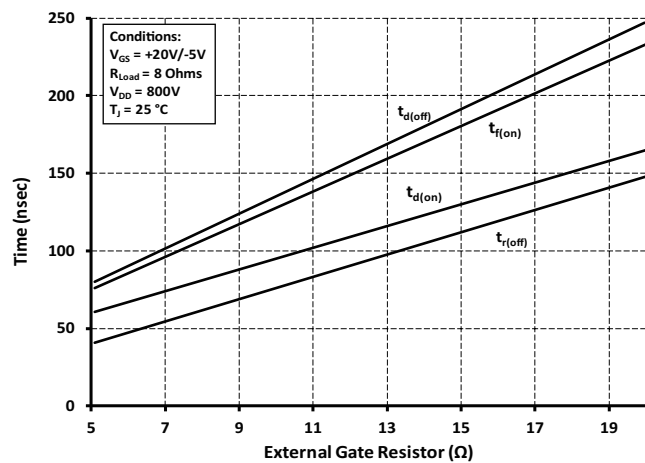
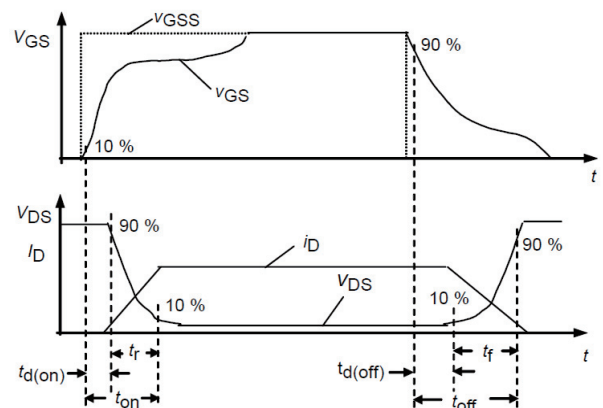


Figure 18. Resistive Switching Time Description





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