



UTT12P10

Power MOSFET

100V, 12A P-CHANNEL POWER MOSFET

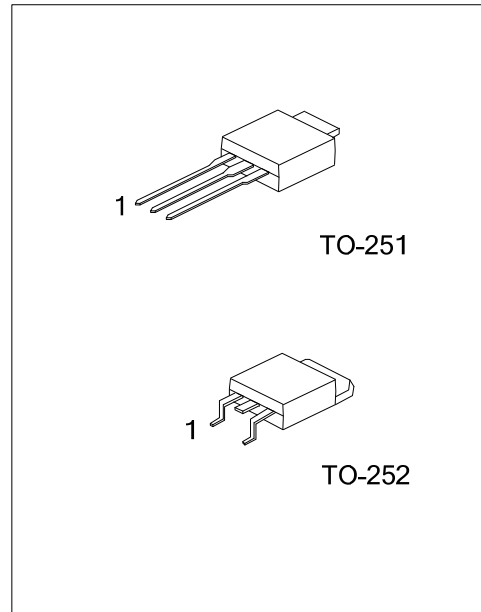
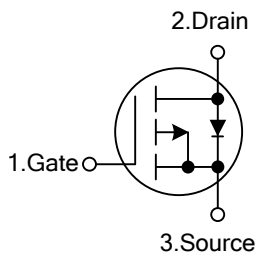
DESCRIPTION

The UTC **UTT12P10** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed, cost-effectiveness and a minimum on-state resistance. It can also withstand high energy in the avalanche.

FEATURES

- * $R_{DS(ON)} < 0.2\Omega @ V_{GS} = -10V, I_D = -12A$
- * High Switching Speed

SYMBOL



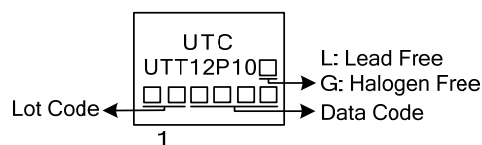
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT12P10L-TM3-T	UTT12P10G-TM3-T	TO-251	G	D	S	Tube
UTT12P10L-TN3-R	UTT12P10G-TN3-R	TO-252	G	D	S	Tape Reel

Note: Pin Assignment: G: Gate D: Drain S: Source

<p>UTT12P10L-TM3-T</p>	<p>(1) R: Tape Reel (2) TM3: TO-251, TN3: TO-252 (3) L: Lead Free, G: Halogen Free and Lead Free</p>
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MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	-100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous, $V_{GSS}@-10\text{V}$	I_D	-12	A
	Pulsed (Note 2)	I_{DM}	-48	A
	Single Pulsed (Note 2)	E_{AS}	60	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)		P_D	125	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55~+150	$^{\circ}\text{C}$

- Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
 2. Repetitive rating; pulse width limited by max. junction temperature.
 3. $V_{DD}=-25\text{V}$, starting $T_J=25^{\circ}\text{C}$, $L=0.83\text{mH}$, $R_G=25\Omega$, $I_{AS}=12\text{A}$. (See Figure 2)

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	θ_{JC}	1.0	$^{\circ}\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS								
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=-250\mu\text{A}$, $V_{GS}=0\text{V}$	-100			V	
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=-100\text{V}$, $V_{GS}=0\text{V}$			-1	μA	
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+20\text{V}$			+100	nA	
	Reverse		$V_{GS}=-20\text{V}$			-100	nA	
ON CHARACTERISTICS								
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-2.0		-4.0	V	
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=-10\text{V}$, $I_D=-12\text{A}$ (Note 2)			0.2	Ω	
DYNAMIC PARAMETERS								
Input Capacitance		C_{ISS}	$V_{DS}=-25\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$		1400		pF	
Output Capacitance		C_{OSS}				590		pF
Reverse Transfer Capacitance		C_{RSS}				140		pF
SWITCHING PARAMETERS								
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=-50\text{V}$, $I_D=-12\text{A}$, $R_G=9.1\Omega$, $R_D=2.4\Omega$, See Fig. 1(Note 2)		40	50	ns	
Rise Time		t_R				38	45	ns
Turn-OFF Delay Time		$t_{D(OFF)}$				314	330	ns
Fall-Time		t_F				66	75	ns
Total Gate Charge		Q_G	$V_{DS}=-80\text{V}$, $V_{GS}=-10\text{V}$, $I_D=-12\text{A}$, See Fig 3 (Note 2)		35	40	nC	
Gate to Source Charge		Q_{GS}				8		nC
Gate to Drain ("Miller") Charge		Q_{GD}				6		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS								
Maximum Body-Diode Continuous Current		I_S				-12	A	
Maximum Body-Diode Pulsed Current		I_{SM}	(Note 1)			-48	A	
Drain-Source Diode Forward Voltage		V_{SD}	$T_J=25^{\circ}\text{C}$, $I_S=-12\text{A}$, $V_{GS}=0\text{V}$ (Note 2)			-5.0	V	
Body Diode Reverse Recovery Time		t_{RR}	$T_J=25^{\circ}\text{C}$, $I_F=-12\text{A}$,		130	260	ns	
Body Diode Reverse Recovery Charge		Q_{RR}	$di/dt=100\text{A}/\mu\text{s}$ (Note 2)		0.35	0.70	μC	

- Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.
 2. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

TEST CIRCUITS AND WAVEFORMS

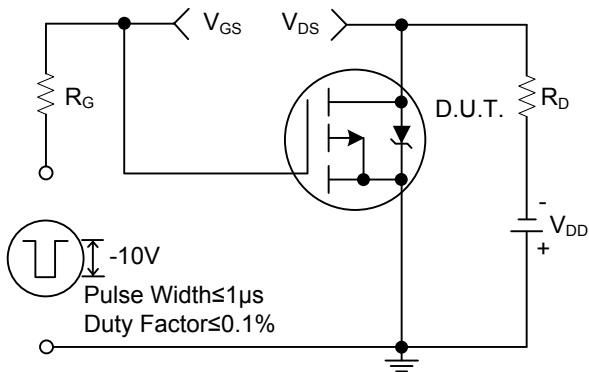


Fig. 1a Switching Time Test Circuit

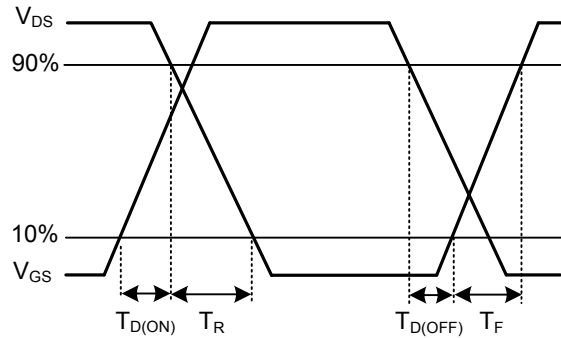


Fig. 1b Switching Time Waveforms

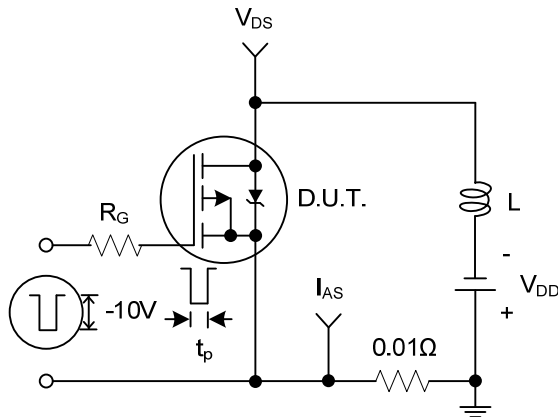


Fig. 2a Unclamped Inductive Test Circuit

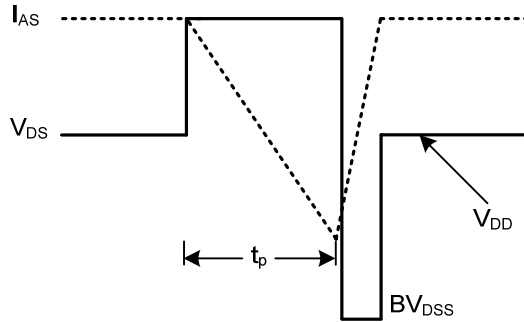


Fig. 2b Unclamped Inductive Waveforms

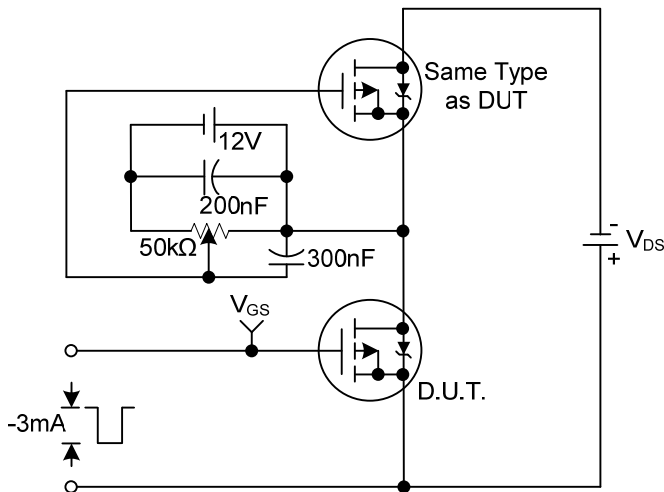


Fig.3a Gate Charge Test Circuit

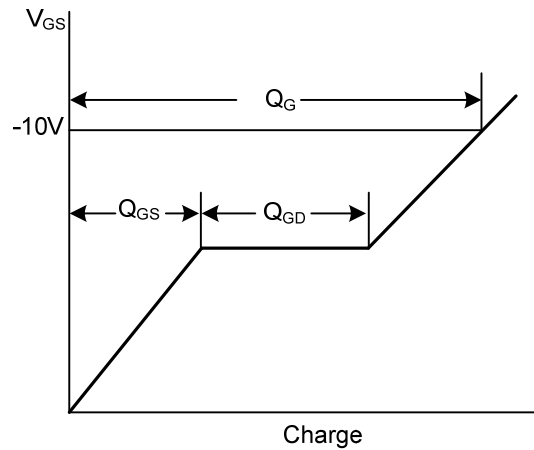
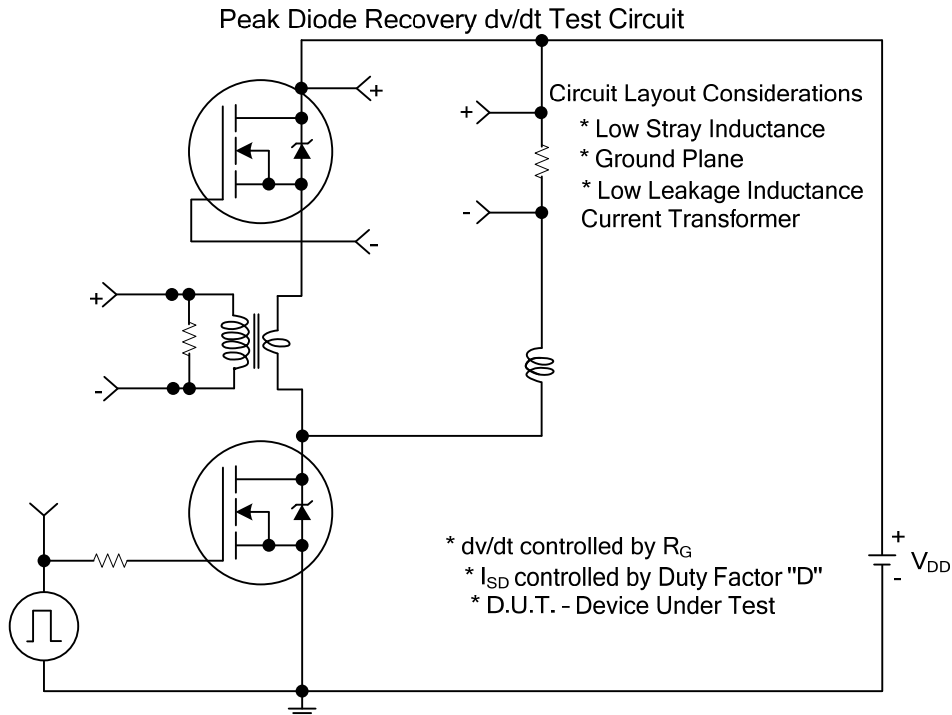
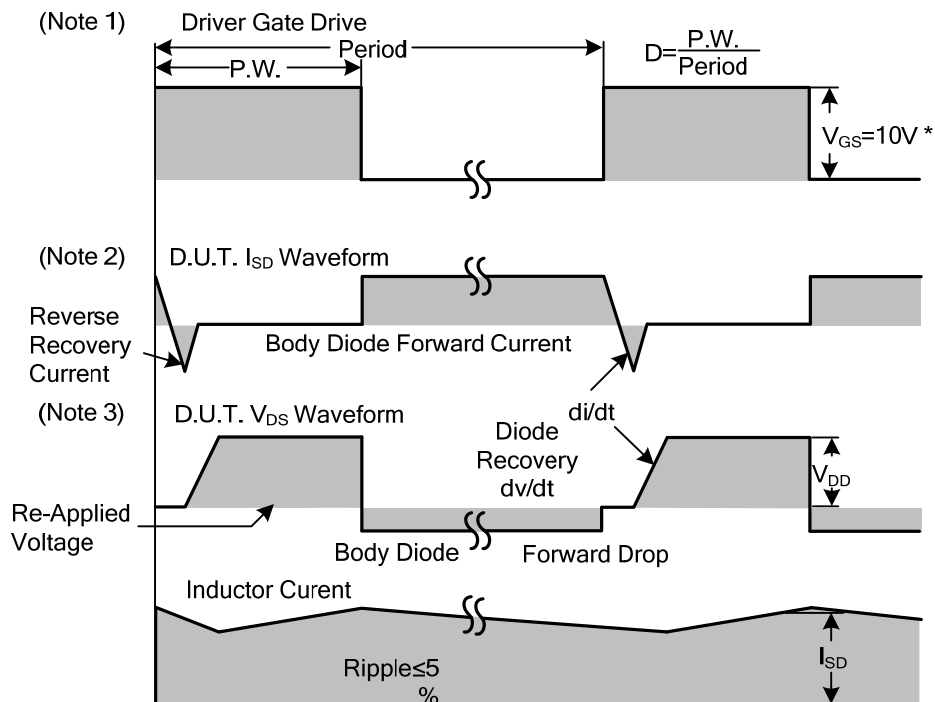


Fig. 3b Gate Charge Waveform

TEST CIRCUITS AND WAVEFORMS(Cont.)



- * Reverse Polarity for P-Channel
- ** Use P-Channel Driver for P-Channel Measurements

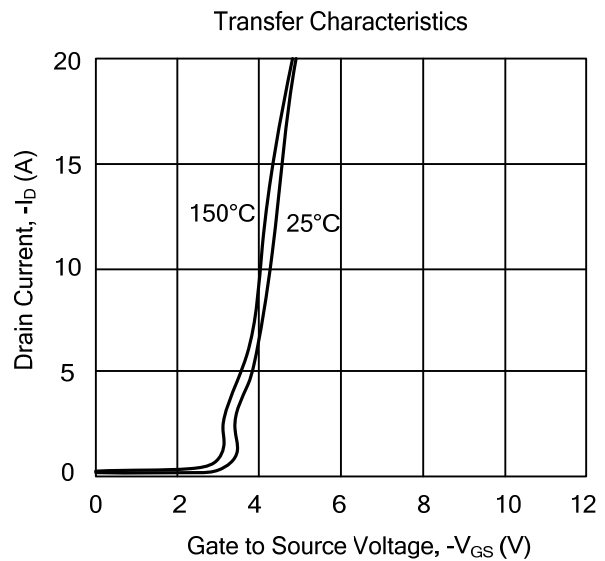
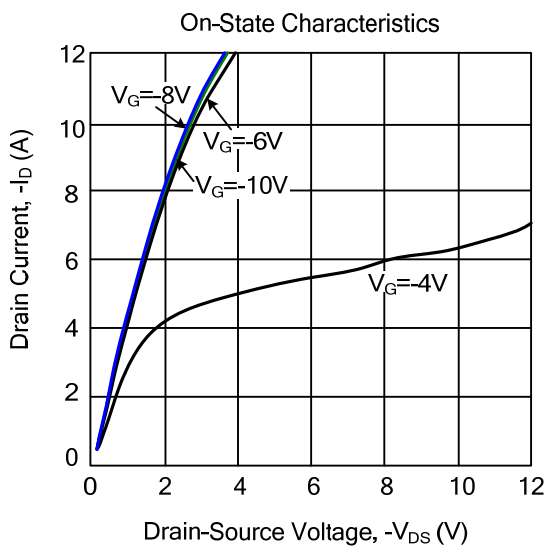
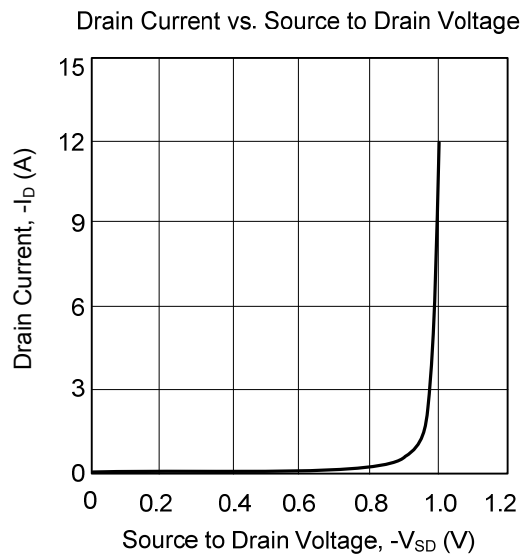
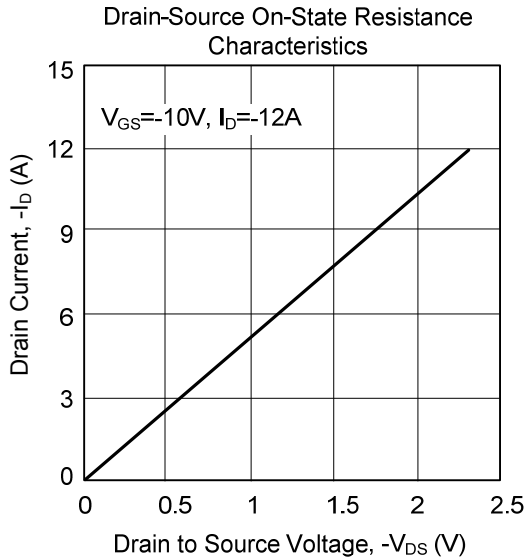
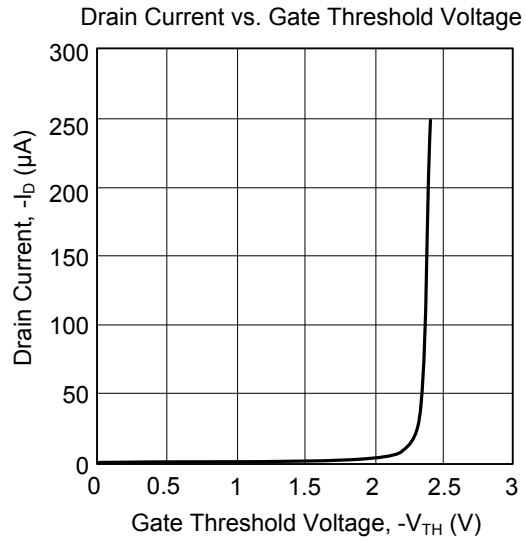
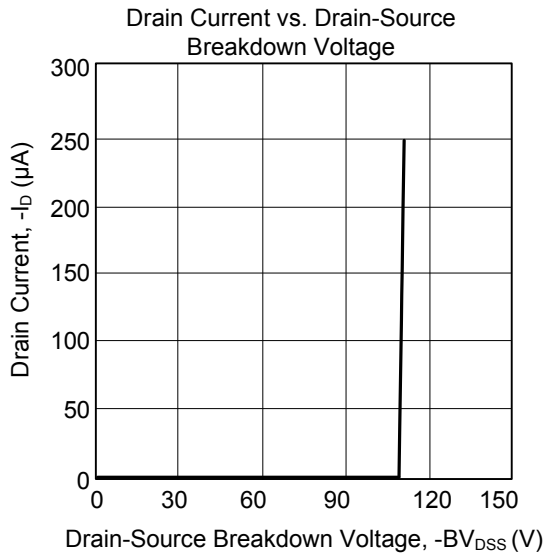


*** $V_{GS}=5V$ for Logic Level and 3V Drive Devices

For N and P Channel Power MOSFET

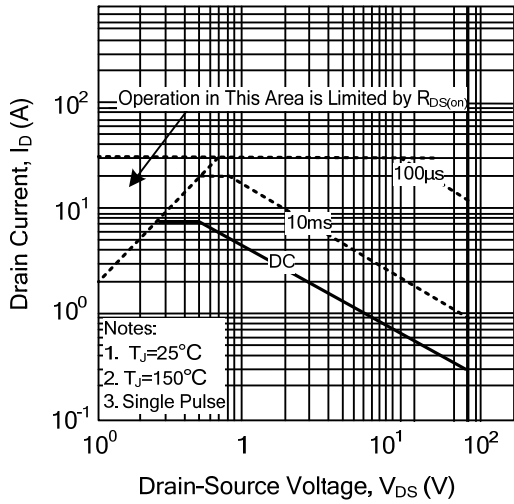
- Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.
 2. $V_{DD}=-25V$, starting $T_J=25^\circ C$, $L=2.7mH$, $R_G=25\Omega$, $I_{AS}=-12A$. (See Figure 2)
 3. $I_{SD}\le -12A$, $di/dt\le 200A/\mu s$, $V_{DD}\le BV_{DSS}$, $T_J\le 175^\circ C$

TYPICAL CHARACTERISTICS

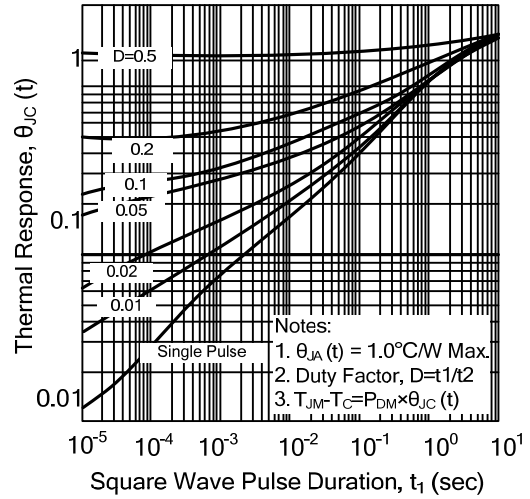


TYPICAL CHARACTERISTICS

Safe Operating Area



Transient Thermal Response Curve



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